

Heritage of the Petroleum Geologist

Edited by Charles A. Sternbach, Robert C. Shoup, Chandler T. Wilhelm and Andrea S. Reynolds

Volume 2



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Introduction

Heritage, Vision, and Mentoring for AAPG's Next Century

by Charles A. Sternbach

The Beginning of the Heritage Programs

As president of the Houston Geological Society in 2000, I was fortunate to organize a special field trip with former AAPG President Michel T. Halbouty, to celebrate the 100th anniversary of the Spindletop oil discovery. This led to more projects with Halbouty leading up to the AAPG Houston Annual Convention in 2002. I had a brainstorm idea when I read Mike Halbouty's 1967 AAPG paper, "Heritage of the Petroleum Geologist." I thought AAPG could build a convention theme on the Heritage topic. Halbouty was very proud of his 1967 paper, calling it "a lifer." Because Houston is a city with global reach, and discoveries are the keys to our success, I proposed, "Our Heritage—Key to Global Discovery" as a theme for the 2002 AAPG Houston Convention. Mike Halbouty had just finished repeating those words when the candid photo of the two of us (below) was taken at the first HGS Neo Geo talk (see Andrea Reynolds' included article in this publication). Halbouty liked the theme very much and Jeff Lund and the AAPG convention organizers adopted the "Heritage" theme.

Back then, Bob Shoup and I discussed how to make the Heritage theme come alive. Bob proposed: "Why don't we organize a DPA Heritage Luncheon?" We realized that a sellout luncheon would be a great way to recognize industry notables and create a mentoring opportunity. Deborah Sacrey and Rick Nagy, leaders in the DPA, enthusiastically joined the project. Fifteen years ago, we asked 43 individuals to contribute their advice and experiences in a DPA publication and to host tables at the first Heritage Luncheon during the AAPG 2002 convention meeting in Houston. Keynote speaker Michel T. Halbouty addressed several hundred attendees. The feeling in the room was positive, supportive, and inspirational. Notable geoscientists who contributed to the first publication sat as hon-

ored heads of tables surrounded by younger professionals in a spirit of thanks and appreciation. During his address, Mike Halbouty started slowly. His voice was soft. As he progressed, his power and conviction accelerated like an unstoppable freight train. "It is the duty," Halbouty implored, "and the obligation, of every geologist to leave his heritage better than he or she found it, for those who come after us."

Based on the success of the 2002 Heritage Luncheon, the DPA instituted the Heritage Award in 2004. This award is given to an individual in the oil and gas industry who is generally known for substantial industry contributions and for taking a proactive role in passing on knowledge and experience to future generations. I remember Bob Shoup, his daughter Nadia, and I visiting Halbouty at his apartment to present the inaugural award to him in early 2004. The Heritage Award has been given 12 times, including Dan Tearpock in 2012 and Clay Riddell 2014 (Heritage Vol. 2 honorees).

The 2017 Heritage Publication

The book you are reading today is a sequel to the 2002 Heritage of the Petroleum Geologist publication. We honor an additional 58 accomplished and distinguished geologists, bringing the total of recognized honorees to 101; 100 to celebrate AAPG's centennial, plus one to symbolize the passing of our heritage to the next generation of energy finders. As before, honorees were asked to share their proudest accomplishments, greatest disappointments, anecdotal stories, and advice. Many of the 58 honorees have presented at AAPG Discovery Thinking Forums during annual conventions in the last decade. Many have received AAPG's highest awards: the Sidney Powers Medal, the Michel T. Halbouty Award, and Norm Foster Outstanding Explorer awards. As you read through their stories, common

themes emerge. The value of associating with great people, the value of great teams, and the value of AAPG and DPA membership.

During a more recent discussion with Bob Shoup, we were contemplating who should speak to our group for this second Heritage Luncheon. Suddenly, Bob had a grin and inspiration came over his face. (I'd seen that same look 15 years earlier...). "Why not have an actor portray Wallace Pratt?" We took the concept to current DPA leadership Chandler Wilhelm and Andrea Reynolds, who enthusiastically endorsed the idea (see photo below). The story line for Wallace's "Toward a Philosophy of Oil Finding—Then, Now, Tomorrow" builds on Pratt's classic 1952 AAPG paper with some updating to accommodate modern discoveries, including unconventional resources.

Pratt's timeless message is that oil is found with ideas. The established basins and plays of Pratt's time are still oil provinces of today, and will continue to yield oil and gas with new ideas. As long as geologists visualize new petroleum frontiers and innovative solutions, we will be able to find oil. Pratt believed exploration success is based on identifying provinces to explore, drilling wells, and teamwork between science and industry in the large-scale pursuit of prosperity.

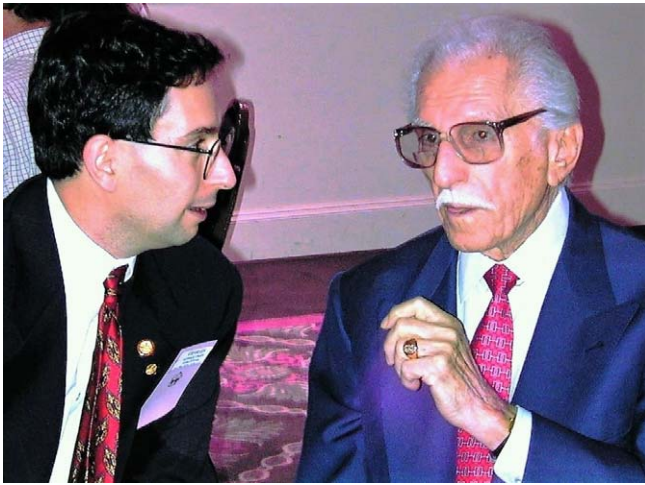
This new Heritage publication also includes two classic papers every geologist should read. Fifty years ago, AAPG published Michel T. Halbouty's 1967 AAPG "Heritage of the Petroleum Geologist." Sixty-five years ago, AAPG published Wallace Pratt's 1952 "Toward a Philosophy of Oil Finding." Lessons on heritage, vision, and mentoring are central to AAPG Heritage programs over the last 15 years. For the reader's benefit, these two papers are reprinted in this book.

What has changed in the 15 years from the first Heritage luncheon? The world has become more interconnected thanks to the internet and social media. More AAPG members hail from global regions, and the society includes more female geoscientists. What remains the same? Geologists are visual problem solvers using maps and cross sections

that speak a global language, regardless of local dialects. The philosopher Joseph Campbell said, "There are few stories, but many story tellers" in his classic 1949 book *Hero with a Thousand Faces*. The "hero journey" starts with a call to adventure, overcoming trials, and returning to share the story. Providing energy to the world is a heroic journey we all share. We are pleased to present some stories of that journey.

Lessons for Today

The notable geoscientists in this publication share precious experience and insights. Great explorers draw upon a lifetime of cumulative exploration experience. As Marlan Downey has said, "Study of history is valuable, a shortcut to wisdom, and additive to personal experience." History is here for the benefit of the reader. We remember Mike Halbouty, who passed away in 2004. Let us fulfill our obligation to contribute to this heritage.



Charles Sternbach and Michel T. Halbouty discuss the Heritage paper and convention themes, September 13, 2000, at an HGS NeoGeos event.



DPA Heritage Vol. 2 organizing committee, left to right: Andrea Reynolds, Chandler Wilhelm, Robert Shoup, and Charles Sternbach.

Wallace E. Pratt Speech (Recreated)

Toward A Philosophy of Oil-Finding: Then, Now, Tomorrow!

*(Modified from) Wallace E. Pratt
AAPG President 1920 - 1921*



As a geologist long engaged in the search for oil, I have witnessed the development of an amazingly effective art of prospecting based on the science of geology, vastly aided since the middle 1920s by geophysics. When we first founded this great Association 100

years ago, the science of geology applied to the search for oil and gas was in its infancy. Our aim in founding the American Association of Petroleum Geologists (AAPG) was to advance the science of petroleum geology and to promote the application of the science for exploring for oil and gas.

I share the satisfaction of the geological profession in this splendid achievement. We have gone far beyond the utmost that seemed possible to me at the beginning of my work in petroleum geology.

Nevertheless, my experience has forced me to the conclusion that even the most finished art of prospecting, by itself, is not adequate to the task of finding the earth's oil and gas. There are other factors that constitute barriers to success in finding hydrocarbons of such a nature that no perfection of methods and techniques, or advances in technology can remove or surmount them.

These factors are fundamental; they are innate in our very habits of thought. Their nature and the way in which they operate to defeat the oil-finder are revealed in multiple examples throughout the last 100 years that are typical of our industry. It is the regular recurrence of this pattern that establishes

this as a fundamental barrier that needs to be overcome to be successful in the search for oil and gas.

A few of these examples may be briefly recited.

In May 1920, during my term as AAPG President, the total past production of this country amounted to only 5 billion barrels. David White, the competent and highly respected chief geologist of the United States Geological Survey (USGS), predicted that "the production of natural petroleum in the United States must pass its peak at an early date, probably within five years and possibly within three years, due to the exhaustion of our reserves." "Our domestic production," he continued, "is not likely ever to exceed 450 million barrels" annually. If we did produce so much we would "exhaust the estimated 7 billion barrels of natural petroleum remaining available in the ground in the United States in 18 years."

Thirty years after this prediction was made, we were producing at roughly five times the rate David White set as the maximum we could ever attain, and over the intervening years we have produced five times as much as the 7-billion-barrel total he estimated as remaining available in the ground. Yet in 1950 we still had a proved reserve base four times larger than David White's estimate of total remaining resources in 1920, to say nothing of an additional undiscovered resource of unknown volume.

Therefore, in retrospect it is clear that David White's prediction was absurdly pessimistic. He was firmly convinced that there was very little oil in the United States. His opinion was based on his knowledge of the occurrence of oil and he was unusually well informed on this subject. Most of us agreed with him at the time. In 1921, this society, the

AAPG, joined with him and his colleagues in the United States Geological Survey in the preparation of a similarly pessimistic estimate of the remaining petroleum resources of the United States.

There are many instances where our knowledge, supported in some cases by elaborate and detailed studies, directed specifically to the question at issue, has convinced us that no petroleum resources were present in areas which have subsequently become sites of important oil fields.

The second incident is a case in point. One of the world's largest oil fields was discovered in 1937 in Kuwait. For 15 years prior to that discovery, the concession was offered for a nominal consideration to a number of the larger companies in the petroleum industry, including the three leading oil companies in the world; and all these companies, in turn, declined the offer. Not one of them thought it worthwhile even to undertake to explore an area that eventually proved to be the site of an oil field larger—far larger—than any previously known.

In other words, at the end of 90 years of vigorous search for oil over the earth and of intensive study of the occurrence of oil in the crust of the earth, the best minds in the oil-finding industry failed to recognize the earth's greatest oil field at the time before it was proved by drilling; worse than that, they were convinced that it was no oil field at all!

Why do we so completely misjudge the potentialities of oil-bearing rocks? It is not that this incredible error arose out of unfamiliarity with the occurrence of oil in the region in question. The Middle East has been famous for its seeps of oil and gas for hundreds of years. Kuwait itself boasted prolific oil seeps.

In adjacent Iran, great oil fields had already been producing for more than 20 years. Moreover, these adjacent Iranian oil fields had been developed and administered by one of the very companies that insisted that Kuwait was not worth exploring. Two of the other leading companies had for years been participants in large oil-producing operations in Iraq, on the other side of Kuwait.

These companies knew more than anybody else about oil in the Middle East. They commanded the services of the best geologists in the world. They had carried out special investigations—long and painstaking geologic research on the occurrence of oil in the Middle East. They were not deterred from exploiting Kuwait by any feeling that they knew too little about the occurrence of oil there to justify the risk of loss the venture would involve. On the contrary, they were deterred by their conviction, based on long experience and extensive surveys in the Middle East, that there was no chance of success in Kuwait. They knew, in short, that “there is no oil in Arabia.”

Because of this knowledge, because of what they thought they knew, the three best-informed oil companies in the world declined the opportunity to explore for oil in Kuwait, where one of the greatest known oil fields was to be discovered only a few years later.

But it was another, smaller company—a company much less familiar with the occurrence of oil in the Middle East—that took the initiative in acquiring the Kuwait concession and exploring it. This smaller company was willing to drill for oil in Kuwait because it did not know that “there is no oil in Arabia.”

Before I leave this incident, I should complete the record by recalling to you that the company that finally had the courage to take up the concession in Kuwait, 10 years after it had first been offered to the leading oil producers of the world, was Gulf Oil Corporation. At the same time, Gulf Oil Corporation also acquired a concession on the neighboring island of Bahrain, in the Persian Gulf, which it later sold to Standard Oil of California. The California Company promptly initiated drilling operations on Bahrain Island and, in 1932, discovered a major oil field. This discovery made it abundantly clear to everyone that there is oil in Arabia, after all, and one of the three great companies that had spurned the Kuwait concession a few years earlier, now reentered the field and finally secured a half-interest with Gulf Oil Corporation in the Kuwait concession.

It would be consoling to us as geologists and oil-finders if we could convince ourselves that our experience at Kuwait constitutes merely an isolated mistake in judgment, out of keeping with our general and normal performance. But this solace is denied us. If we examine the record, we find that Kuwait is only one more instance in a long series of similar misjudgments. Let me provide more recent examples to further substantiate my thesis.

The advent of the information age has provided an amazing new array of tools and technologies with which to image the subsurface and to search for oil and gas with a degree of detail and precision that could not have been imagined when the AAPG was founded a century ago. But these tools have not changed the fact that the fundamental challenge for the explorer is the ability to distinguish between what is known and what is unknown, and to envisage a petroleum accumulation before it is drilled.

The enormous growth of Unconventional natural gas in North America is probably the best recent example of the natural conservatism of the trained scientific mind when it comes to envisioning future hydrocarbon resources. During the decade of the 1990s, many different expert agencies such as the USGS, the Potential Gas Committee, the National Petroleum Council, and the Gas Research Institute all developed models to forecast the natural gas endowment of the United States (Proved Reserves as well as undiscovered resources, both conventional and unconventional). The methodologies and data all differed at the margins, but all the assessments converged on a number around 1,000 TCF of remaining gas resources (or around a 50-year resource life at the 1996 production level of ~20 TCF per year). These forecasts were, in effect, implying that the gas endowment would eventually be overtaken by demand and have to be supplemented by imports from overseas, which led to a small cottage industry of companies proposing and permitting LNG import terminals in the years that followed.

Fast-forward 20 years to 2016. The US now produces more natural gas than at any previous time in its history, roughly 29 TCF per year, mostly from plays that were not even envisaged in the 1990s. The most recent 2015 Potential Gas Committee report now forecasts “an exceptionally strong and optimistic gas supply picture for the nation,” with a total technically recoverable resource base of ~2500 TCF, in effect doubling the resource life of the US to more than 100 years at current consumption levels. Plans for LNG imports have turned to plans for LNG exports, and it is price rather than resource availability that challenges our industry. This dramatic change in perception has occurred within the professional careers of the very distinguished people in this room.

One need look no further than Pennsylvania, the site of the world’s first oil well (the Drake well), to see the magnitude of what can happen in just a few short years. The Marcellus and Utica plays have become the most dramatic resource development story anywhere on the planet, and have grown gas production from only ~1 Bcf/d in 2008 to ~22 Bcf/d in 2016, and now comprise ~30% of the North American market. Pipelines that flowed east are now being reversed to enable this enormous resource to reach markets in the Gulf Coast and mid-Continent. The Marcellus play alone (at ~18 Bcf/d) now produces more gas than any other country in the world except for Russia, making Pennsylvania arguably the largest gas field on the planet.

To demonstrate that the Appalachian Basin is not a fluke, the Permian Basin provides a recent corollary example for oil. Oil was first discovered in the Permian in 1921 (during my tenure as AAPG President) and by 1976 reached a peak production of ~1.5 MMBO/d, after which it went into a ~30-year decline as conventional fields matured and capital went elsewhere (mainly offshore) in search of larger fields. By the end of the century the basin was considered played out for new discoveries. All that changed with the advent of horizontal drilling and multistage fracking, and by 2016 the Permian reached a production level of ~2 MMBO/d. In November

of this year the USGS announced its updated Mean Technically Recoverable resource assessment for the Wolfcamp shale in the Midland Basin of ~20 BBO, making it the largest unconventional oil resource in the US.

The startling fact is that perhaps the largest oil and gas fields ever discovered in the US have been brought to market within the past decade by geoscientists, some of whom are in this room, working in areas long thought to have been played out, thinking creatively for opportunities to reinterpret old paradigms, and recognizing and separating what is known from what is unknown.

Each of the examples just recited illustrates a mental attitude that becomes a formidable barrier to oil-finding, and the natural conservatism of the trained scientific mind—a trait which, it has been said, has grievously impeded the quest for truth, everywhere. It has impeded the search for oil and gas.

David White was conservative. He dealt with facts—so far as they were known; and he would not venture beyond the known. Because so much was unknown to him, and therefore ignored by him, David White erred. We all erred with him.

The same can be said for all the agencies that grossly underestimated the natural gas resource endowment of the US in the 1990s. These were among the most highly trained and experienced professionals in our industry, but this did not prevent them from failing to foresee the magnitude of increase in natural gas resource availability brought about by horizontal wells and multistage hydraulic fracturing, even though they had expressly considered unconventional resources in their estimates.

Consistently, from the birth of the industry to today, the scientific community has grossly underestimated the world's petroleum resources. This conviction of our best minds that little or no oil and gas remained to be found has continuously handicapped the search for new resources. Unless the oil-finders believe that there is more oil to be discovered, they will not drill for oil.

The qualities that mark the individual oil-finder are faith, persistence, the venture spirit, and vision. If their knowledge makes them overly conservative, or overly reliant on technology, or obscures from them the fact that much remains always unknown, then this will serve as an inevitable barrier to finding new resources.

One indispensable attribute of the successful oil-finder is vision. My good friend A.I. Levorsen has said “until a discovery well has been drilled, the undiscovered oil or gas field exists at best only as an idea in the mind of the geologist.” If it is in the mind of geologist or the oil-finder that new fields first take form, then discovery must wait on our mental visualization and our imagination.

Where oil and gas are first found, in the final analysis, is in the minds of explorers. The undiscovered oil and gas field exists only as an idea in the mind of some oil-finder. When no one any longer believes more oil and gas are left to be found, no more fields will be discovered. But so long as a single oil-finder remains with a mental vision of a new oil field to cherish, and so long as our social, political, and economic environment allows that oil-finder the freedom and incentive to explore, new oil fields may continue to be discovered.

So today, we honor our heritage, and the enormous contributions made by our profession over the last 100 years to the well-being of the people of this world. Just consider the magnitude of what has been achieved. Despite two devastating world wars, the world's population has grown by a factor of four, to about 7.5 billion in 2016, and per capita GDP has grown by a factor of roughly 15. None of this would have been possible without the energy powered by the oil and gas fields discovered in the minds of past generations of explorers. Abundant affordable energy has enabled billions of people to enjoy a standard of living that could not have been imagined 100 years ago, when the world was enduring some of the darkest days of the Great War.

As we look to the next 100 years, it is anticipated that the world's population will continue to grow, perhaps to 10 billion people

or more. And despite improvements in energy efficiency and the advent of new energy sources that will penetrate the market, total energy usage is expected to roughly double by the end of this century, with oil and gas continuing to play a major role in the overall energy mix. Most of this is yet to be discovered, and will be found by future generations of explorers, some of whom are at this convention and are here with us today.

The enormity of this task will challenge the best and brightest among us. To meet this challenge, I would urge all of you, young and old, to find within yourself the

Faith in yourself and our science, and in your ability to find oil and gas;

Persistence you will need to fully evaluate the data needed to define your prospect, and the persistence you will need to convince others of its potential;

Venture spirit you will need to get your prospect leased and drilled;

And, most importantly, vision. The ability to see and understand the ideas and interpretations that make your prospect, and the vision you need to see your prospect drilled.

Look around you. This room is filled with like-minded colleagues, Colleagues who share our passion, and our belief that our profession serves a vital public interest, and that the best days for our profession still lie ahead.

There is more oil and gas that must be found to power our world's economy. Let us help each other in the task before us and may we share our knowledge with future generations. Good luck to all of you in that search.

BULLETIN
of the
**AMERICAN ASSOCIATION OF
PETROLEUM GEOLOGISTS**

DECEMBER, 1952

TOWARD A PHILOSOPHY OF OIL-FINDING¹

WALLACE E. PRATT²
Carlsbad, New Mexico

ABSTRACT

The United States—a country whose total petroleum resources constitute but a minor fraction of the total for the earth as a whole—has supplied from oil fields within its own boundaries two-thirds of all the oil the world has consumed in the past. This remarkable record might plausibly be attributed to the proficiency of Americans in the art of oil-finding. But petroleum geologists, on whose science the art of oil-finding is based, make no such claim. Geologists generally have failed to anticipate the magnitude of the petroleum resources now proved to have existed in this country. On the contrary, our best informed authorities have consistently and grossly underestimated the size of these resources in the past. No one has been more surprised than they at our achievement. As a matter of fact, a finished art of prospecting is not the only factor—not even the most important factor—in making possible the discovery of the oil fields which make up the petroleum resources of a nation. There exist more formidable barriers to success in oil-finding than the lack of perfected methods and techniques of exploration: the ultra-conservatism of the trained scientist and engineer, the tendency of the human mind to discount or to ignore the significance of what remains unknown to it, the restriction of free enterprise, these have been greater handicaps to success in the search for oil fields over the world. Where oil fields are really found, in the final analysis, is in the minds of men and we have found an unparalleled number of oil fields in the United States, not because our petroleum resources were exceptionally abundant, but because in our economic and political climate men have enjoyed unparalleled freedom to devote themselves to the search for oil fields.

As a geologist long engaged in the search for oil, I have witnessed the development over the last 40 years of an amazingly effective art of prospecting based on the science of geology, vastly aided since the middle 1920's by geophysics. I share the satisfaction of the geological profession in this splendid achievement. We have gone far beyond the utmost that seemed possible to me at the beginning of my work in petroleum geology.

Nevertheless, my experience has forced me to the conclusion that even the most finished art of prospecting, by itself, is not adequate to the task of finding

¹ This and the following three papers were presented as part of the program of the regional meeting of the Association and the 18th annual meeting of the South Texas Geological Society, at Austin, October 18–20, 1951. Presiding officers were Frank A. Morgan, president of the A.A.P.G., and John R. Sandidge, president of the South Texas Geological Society. Details of the meeting were reported, in the A.A.P.G. *Bulletin*, December, 1951.

² Geologist.

the earth's oil. There are other factors which constitute barriers to success in oil-finding of such a nature that no perfection of methods and techniques of search can remove or surmount them. These factors are fundamental; they are innate in our very habits of thought. They are greatly re-enforced by the existing social order in many countries. Their nature and the way in which they operate to defeat the oil-finder are revealed in two incidents—familiar to all of us—which are typical of the activities of the oil-producing industry. These incidents may be briefly recited.

In May, 1920, when the total past production of this country amounted to only 5 billion barrels, David White, the competent and highly respected chief geologist of the United States Geological Survey, predicted that “the production of natural petroleum in the United States must pass its peak at an early date, probably within five years and possibly within three years, due to the exhaustion of our reserves.” “Our domestic production,” he continued, “is not likely ever to exceed 450 million barrels” annually. If we did produce so much we would “exhaust the estimated 7 billion barrels of natural petroleum remaining available in the ground in the United States in 18 years.”

To-day, 30 years after this prediction was made, we are producing at roughly five times the rate David White set as the maximum we could ever attain, and over the intervening years we have produced five times as much as the total he estimated as remaining available in the ground. Yet we still have a proved reserve four times larger than David White's estimate of total remaining resource in 1920, to say nothing of an additional undiscovered resource of unknown volume.

It is clear in retrospect, therefore, that David White's prediction was absurdly pessimistic. He was firmly convinced that there was very little oil in the United States. His opinion was based on his knowledge of the occurrence of oil and he was unusually well informed on this subject. Most of us agreed with him at the time. In 1921, this society, the American Association of Petroleum Geologists, joined with him and his colleagues in the United States Geological Survey in the preparation of a similarly pessimistic estimate of the remaining petroleum resources of the United States.

There are many instances where our knowledge, supported in some cases by elaborate and detailed studies, directed specifically to the question at issue, has convinced us that no petroleum resources were present in areas which subsequently became sites of important oil fields. The second incident here to be recited, is a case in point.

Over a period of 15 years preceding its discovery in 1937, the largest known oil field in the world—Kuwait, in the Middle East—was offered for a nominal consideration to a number of the larger units in the petroleum industry, including the three leading oil companies—British, Dutch, and American—in the world; and all these companies, in turn, declined the offer. Not one of them thought it worth while even to undertake to explore an area which, once it was explored, proved to be the site of an oil field larger—far larger—than any previously known.

In other words, at the end of 90 years of vigorous search for oil over the earth and of intensive study of the occurrence of oil in the crust of the earth, the best minds in the oil-finding industry failed to recognize the earth's greatest oil field (to date) before it was proved by drilling: worse than that, they were convinced that it was no oil field at all!

Why do we so completely misjudge the potentialities of oil-bearing rocks? It is not that this incredible error arose out of unfamiliarity with the occurrence of oil in the region in question. The Middle East has been famous for its seeps of oil and gas for hundreds of years. Kuwait itself boasts prolific oil seeps. In adjacent Iran, great oil fields had already been producing for more than 20 years. Moreover, these adjacent Iranian oil fields had been developed and were currently administered by one of the very companies which insisted that Kuwait was not worth exploring. Two of the other leading companies had for years been participants in large oil-producing operations in Irak, on the other side of Kuwait.

These companies knew more than anybody else about oil in the Middle East. They commanded the services of the best geologists in the world. They had carried out special investigations—long and painstaking geologic research on the occurrence of oil in the Middle East. They were not deterred from exploiting Kuwait by any feeling that they knew too little about the occurrence of oil there to justify the risk of loss the venture would involve. On the contrary, they were deterred by their conviction, based on long experience and extensive surveys in the Middle East, that there was no chance of success in Kuwait. They knew, in short, that “there is no oil in Arabia.”

Because of this knowledge, because of what they thought they knew, the three best informed oil companies in the world declined the opportunity to explore for oil in Kuwait, where our greatest known oil field was to be discovered only a few years later. But another, smaller company—a company much less familiar with the occurrence of oil in the Middle East—took the initiative in acquiring the Kuwait concession and exploring it. This smaller company was willing to drill for oil in Kuwait because it did not know that “there is no oil in Arabia.”

Before I leave this incident, I should complete the record by recalling to you that the company which finally had the courage to take up the concession on Kuwait, ten years after it had first been offered to the leading oil producers of the world, was Gulf Oil Corporation. At the same time Gulf Oil Corporation acquired also a concession on the neighboring island of Bahrein, in the Persian Gulf, which it later sold to Standard Oil of California. The California company promptly initiated drilling operations on Bahrein Island and, in 1932, discovered a major oil field. This discovery made it abundantly clear to everyone that there is oil in Arabia, after all, and one of the three great companies which had spurned the Kuwait concession a few years earlier, now re-entered the field and finally (1934) secured a half interest with Gulf Oil Corporation in the Kuwait concession.

It would be consoling to us as geologists and oil-finders if we could convince

ourselves that our experience at Kuwait constitutes merely an isolated mistake in judgment, out of keeping with our general and normal performance. But this solace is denied us. If we examine the record, we find that Kuwait is only one more instance in a long series of similar misjudgments. And these errors are frequently the errors of our best informed authorities.

Each of the incidents just recited illustrates a mental attitude which becomes a formidable barrier to oil-finding. The first is an example of the natural conservatism of the trained scientific mind—a trait which, it has been said, has grievously impeded the quest for truth, everywhere. It has impeded the search for oil. David White was conservative. He dealt with facts—so far as they were known; and he would not venture beyond the known. Because so much was unknown to him, and therefore ignored by him, David White erred. We all erred with him. Consistently, from the birth of the industry to the inception of the Second World War, the scientist has grossly underestimated the petroleum resources of the United States. This conviction of our best minds that little or no oil remained to be found has continuously handicapped the search for oil. Unless men can believe that there is more oil to be discovered, they will not drill for oil.

The second incident illustrates an even more pernicious habit of mind. Joseph Pogue has emphasized this singular trait in a recent unpublished discussion of estimates of petroleum reserves. That which becomes known to us in a particular field, he says, however small our knowledge may be, tends often, not only to color, but actually to obscure what remains unknown to us in the same field. A “little learning” about our proved reserves, for example, makes it impossible for us to measure our total resources by any other yardstick. If the part we know is small the unknown extension of it must also be small. What we learn, instead of illuminating what we have still to learn, sometimes casts a mental shadow over it, rendering it less discernible and impelling us to ignore it.

Those who are trained and experienced in the art of oil-finding appear to be particularly susceptible to this blindness which comes with the acquisition of a little knowledge. Oil-finders, of necessity, are guided by their observation of the facts—their knowledge of the occurrence of oil in the area they have to explore. But the oil-finder can almost never know all the factors with which he has to deal—the actual conditions at depth beneath the surface of an unexplored, or incompletely explored, segment of the earth's crust. For him, the disparity between the known and the unknown is unusually large. For him, the need to be always alert to the potentialities of what he does not know is paramount. He must maintain a constant awareness that he does not know everything that may enter into his problem. To assume that our knowledge of an area is complete when it is not, may be to conclude that there is no oil where there is oil. So it is that we conclude from an inadequate knowledge of the facts that “there is no oil in Arabia.”

The record demonstrates that, as oil-finders, we have persistently underestimated the amount of oil and gas that have been stored up in the earth's crust.

We have been too conservative always. Despite all our mistakes, however, we have already found in the United States far more oil than our knowledge of the occurrence of oil permitted us to anticipate. Our discoveries since 1920 are already almost 9 times greater than David White's estimate of the total remaining resource; and we know there are still new oil fields to be discovered.

We have produced in the United States nearly two-thirds of all the oil the world has consumed in the past. This means a past production in this country nearly 10 times as great per unit of area of earth's crust favorable for the occurrence of oil, as the rest of the world.

It was long held that our ability to find and produce oil more rapidly and more abundantly than the rest of the world arose from an exceptionally rich endowment of natural resources in oil. But it is clear to-day that oil resources far richer and larger than ours exist elsewhere over the earth.

How, then, does it come about that we have been able to produce so much more oil in the past than the rest of the world? And how have we surmounted or circumvented the mental barriers which, as we have noted, stand in the way of mankind's search for oil?

Since the very inception of the industry, the finding and producing of oil in the United States have been carried on by literally thousands of independent enterprises; thousands of individuals, each an oil-finder in his own right; each free to put to the practical test of the drill his own ideas and theories of where oil might be found; and each spurred on to the drilling of exploratory wells by the assurance that if he made a discovery, he would reap a reward commensurate with its value to society.

Under these circumstances, hundreds of thousands—more than a million—wells have been drilled in the United States in search for oil. And many thousands of them have been drilled at places which were believed by everyone except the driller, to be unfavorable for the occurrence of oil. Yet, time after time, these wells at unfavorable locations discovered major oil fields. This is the way we have found oil in the United States—the drilling of many exploratory wells all over the land. By this procedure more oil fields have been discovered than anybody had dreamed were possible.

Under these circumstances, also, the mental barriers that normally stand in the way of the oil-finder were dissipated. The conservatism of the trained scientist was nullified by the action of the untrained oil-finder, unhampered by "a little learning." If one man said there is no oil in Arabia (or West Texas) another man promptly drilled a well there to see—and often he found oil.

The freedom of every citizen to explore by drilling wells for oil and the assurance to every citizen of a generous reward for success in finding oil have accrued to us out of our social and political environment. These are advantages which have contributed more to our achievement in oil-finding than the perfection of the art of prospecting. The citizens of few other countries possess these advantages. To their lack is due, in large part, the relatively poor showing in the

search for oil over much of the earth. Oil-finding is at once the task of the individual and of the community at large. If the action of either is inappropriate, the search languishes.

The qualities which mark the individual oil-finder are faith, persistence, the venture spirit, and vision. If he is informed and trained in the art of oil-finding, so much the better; unless his knowledge makes him over-conservative, or obscures for him the fact that much remains always unknown to him. If his knowledge blinds him to the unknown, his discoveries will be fewer.

One indispensable attribute of the successful oil-finder is vision. Levorsen has said "until a discovery well has been drilled the undiscovered oil or gas field exists at best only as an idea in the mind of the geologist." If it is in the mind of geologist, or the oil-finder, that new fields first take form, then discovery must wait on our mental visualization—our imagination.

Where oil is first found, in the final analysis, is in the minds of men. The undiscovered oil field exists only as an idea in the mind of some oil-finder. When no man any longer believes more oil is left to be found, no more oil fields will be discovered, but so long as a single oil-finder remains with a mental vision of a new oil field to cherish, along with freedom and incentive to explore, just so long new oil fields may continue to be discovered.

Memorial

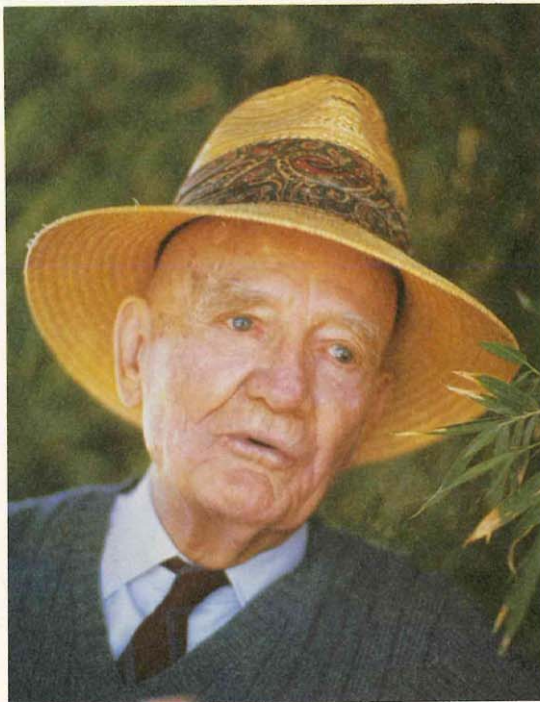
When Wallace Pratt died quietly at his home in Tucson, Arizona, on Christmas Day, 1981, at age 96, the world lost one of its most distinguished geologists. But Wallace Pratt was not only a geologist, he was also a businessman, a scientist of broad interests, a humanist, a philosopher, and a magnificent human being. He combined the very best qualities of a creative scholar with those of a practical-minded executive, the qualities of a successful industrialist with those of a nature lover, and the qualities of an entrepreneur with those of a farsighted prophet.

His career—indeed, his whole life—was a clear reflection of his character, his optimism, his vision, his courage, his flexibility, and his deep affection for and his genuine interest in his fellow men and women.

As E.L. DeGolyer—another giant in the field of petroleum geology—so ably put it, “he has raised the profession of petroleum geology to an eminence and a dignity which it would not otherwise have attained.”

Wallace Pratt was indeed a “man for all seasons.”

He was born in Phillipsburg, Kansas, on March 15, 1885. He recounted some of the history of his youth in a lively 1978 letter to Hollis Hedberg. His father, William Henry Pratt, a wounded Civil War veteran, traveled by stagecoach from New York to the river crossing where Kansas City now stands. Here he joined a wagon train bound for Oregon “headed by a ‘Pennsylvania Dutch’ adventurer, M.J. Bostetter. By the spring of 1873, the wagon train had gotten as far as the present Phillips County,” north-central Kansas, immediately south of the Nebraska border, on what Wallace called “the frayed-out eastern margin of the short-grass country of the high plains.” “There was dissension. Part of the group chose a new leader and pushed on, but most of them, including Bostetter” and Wallace Pratt’s father stayed and founded Phillipsburg. “Beautiful country! Vast prairies—grass stirrup-high. What could Oregon have as good as this?” William Henry Pratt married Bostetter’s daughter, Olive



WALLACE EVERETTE PRATT
1885-1981

By Amos Salvador
Austin, Texas

Belle Bostetter, and from this marriage ten children were born. The senior Pratt became a circuit riding judge and wanted his son Wallace to study law. “But Blackstone proved to be ‘the furthest thing I was from.’” His father was disappointed in him. “More than that he was exasperated. ‘What are you going to do with yourself? Here you are 15 years old and you still don’t know what you are going to do. You don’t want to raise wheat. You don’t want to study law. You don’t want to learn banking. The only thing you can think is, you want to go to college. All right, you just go to college. But don’t expect me to pay your way. You pay your own way.’” Since there were four younger children in the family to be raised and educated, Wallace understood his father’s position. On September 3, 1903, at the age of 18, with his savings of \$142 (earned as a farm worker during the year following his graduation from high school) pinned to his undershirt, he did go to college—the Uni-

versity of Kansas at Lawrence. He was the third young man from Phillipsburg to enter K.U.—his older brother Frank had been the first one, eight years earlier.

The University of Kansas opened a new world for Wallace Pratt. His latent interest in geology was stimulated when, as a 19-year-old sophomore, he came in contact with Erasmus Haworth, state geologist and dean of the School of Earth Sciences (“he was a second father to me”). From that point on, in his own words, “geology became for me not only a means of livelihood but quite literally a way of life.” He worked his way through the university first as a night clerk at a local hotel and later as an assistant in various capacities to Professor Haworth. He received his A.B. and B.S. degrees simultaneously in 1908, his M.A. degree in 1909, and in 1914, after five years of professional experience, he was awarded the degree of Engineer of Mines in Geology. Thus it was that the world lost one more farmer, lawyer, or banker, but gained a geologist whose exercise and practice of his profession over the

next almost three-quarters of a century can only be described as truly extraordinary.

Upon graduation from the University of Kansas in 1909, Wallace Pratt joined the U.S. Bureau of Insular Affairs as a geologist in the Division of Mines of the Bureau of Science of the Government of the Philippines in Manila. He became chief of the Division of Mines in 1913. According to Wallace his only real accomplishment in the Philippines was “largely fortuitous.” On January 29, 1911, Taal volcano, 40 miles south of Manila, “blew its top.” Pratt, on his own initiative, rushed to the volcano before any other scientific observer and was the first to report the devastation and the frightful loss of life caused by the eruption. He claimed modestly: “The eruption made me. It took a cataclysm to do it.”

Wallace Pratt returned to the United States in 1915. For the next two years he worked for the Producers Oil Company (an affiliate of the Texas Company) first conducting geological reconnaissances in Costa Rica and Mexico, and then as division geologist in their Wichita Falls, Texas, office.

In 1918, Wallace Pratt was approached by a small, one-year-old Houston oil company in urgent need of new oil reserves. They wanted geological advice. He accepted the offer, and on March 1, 1918, Wallace Pratt was employed as the first and chief geologist of the Humble Oil and Refining Co. Shortly after, he also became the head of the Geologic, Lease, and Scouting Department. It was the beginning of a brilliant career that would last 27 years and that would lead him to eventually become a vice president and member of the Executive Committee of the Standard Oil Co. (N.J.), now Exxon Corporation, since 1919 Humble’s parent company.

Wallace Pratt’s years with Humble in Houston illustrate some of his qualities as a businessman and petroleum geologist: his courage, his excellent judgement, the belief in his own ideas, his unflagging optimism, his vision, his flexibility, his shrewdness as a trader, and his great ability to select, train, and deal with people. These were the years that marked the dawn of the professionals in the oil business, the years when, for the first time, science and industry began to work together in harmony, when geologic principles gradually came to pervade the thinking of the oil business. In this environment, Wallace Pratt was at his best.

He began at once to build a strong geological department. By the end of 1918 he had a staff of three geologists, and by early the next year the number had increased to ten. It continued to grow in the years to come. Under their new chief geologist, Humble pioneered in the use of micropaleontology in the search for oil, and in the astute use of geological scouts. It undertook geophysical prospecting, initiated exploration research, and, perhaps most importantly, began an extensive leasing program.

The launching of the geophysical exploration program exemplifies the flexibility that allowed Wallace Pratt to change his mind quickly on the basis of new information. His ability to make fast, accurate decisions was particularly effective. These traits contributed to his success in the fast-moving and highly competitive exploration for oil. After having looked with little confidence upon the initial efforts of competing companies to use the torsion balance and the refraction seismograph in the location of new oil fields, Wallace Pratt soon came to recognize the great value of these exploration tools and, having done that, promoted vigorously the use of geophysics by Humble. Since geophysical instruments were of European manufacture and not readily available in the United States,

Pratt organized a research group to build the instruments and train the crews to use them. By 1925, Humble had a seismic crew in the field, in 1926 the first discovery was made using this technique, and the next year 14 crews were exploring for oil along the Gulf Coast.

Since his very early days with the company, Wallace Pratt firmly believed in the need for technical research. In 1919 discussing the problems of geology in north-central Texas, he stated that these problems were “research problems, and (that) a geological department in the petroleum industry today should be on the same basis as are research departments in other large progressive industries.” Humble, consequently, mounted a research effort in petroleum exploration very early in its young life.

But Pratt’s most important contribution to Humble’s success may have been his persistence in recommending to the Humble board that the company make extensive acquisitions of undeveloped acreage, particularly large blocks of land, not subject, as were checkerboard leases, to competitive drilling and production. He clearly saw how critically important it was to hold extensive acreage in attempting to develop new reserves. Pratt himself negotiated many of these large acreage acquisitions. His most celebrated success was the leasing in 1933, after 15 years of patient negotiations, of the one-million-acre King Ranch in south Texas, the largest single oil and gas lease ever purchased in the United States. This he accomplished virtually single-handedly and in the face of near unanimous unfavorable expert opinion from the leading geologists of the time. It took courage, persistence, broad vision, and the conviction that he was right. Wallace Pratt’s belief in the need to hold extensive leases and to continue to build up the company’s reserves never weakened, even after the discovery of the East Texas field in 1930 brought down the price of oil to 10 cents a barrel. He was able to see clearly beyond the existing market chaos and to predict that future demand for oil would grow faster than the volume of proved reserves.

Wallace Pratt’s leasing and exploration initiatives resulted in Humble’s phenomenal growth in 20 years from a struggling small oil company to the leading producer of oil and the holder of the country’s largest petroleum reserves. In 1918, the company had reserves of 32 million barrels and a production of about 12,000 barrels per day of crude and condensate; by 1937, the proved reserves had increased to 1.9 billion barrels—an amount estimated at more than double those of its nearest competitor—and the daily production stood at almost 140,000 barrels. These prodigious achievements were recognized by Pratt’s election to Humble’s Board of Directors in 1925 and to vice president in 1933.

His farsightedness, however, was not restricted to exploration matters. As early as 1925, he quickly recognized the significance of the new scientific and engineering developments in production and he was the first to urge that Humble add a trained petroleum engineer to its organization and expand its production research. He had even earlier realized the need to improve the reservoir recovery—he remarked that “the flow from these wells does not represent the total volume of the oil in the reservoir...I doubt if these wells flow as much as 50% of the total volume available.” In the 1920s, Humble pioneered in the control of production, the elimination of wasteful flaring of natural gas, the development of joint agreements for unit operation of oil fields, and publicly favored wide spacing for wells, ratable withdrawals from reservoirs, state enforcement of conservation laws, and the limiting of production

to market demand. Wallace Pratt had a great deal of influence in the shaping of these policies, considered revolutionary by many at that time.

In 1937, Wallace Pratt left Humble to become a director and member of the Executive Committee of Humble's parent company, the Standard Oil Co. (N.J.), in New York. In 1942 he was elected a vice president of the company. During his years with Jersey, Pratt directed the worldwide exploration activities of the company with the same sagacity and clear-sightedness with which he had guided the young Humble during its first and most critical years. But he was now playing a different role: he was now the international negotiator, the worldwide representative of his company and of his country. His open mind, his sense of fairness, his broad outlook, and his attention to social and civic responsibilities served him well in this capacity.

In 1945, at age 60, Wallace Pratt, partly for health reasons, retired from the Standard Oil Co. (N.J.). After the death in 1939 of his first wife, Pearl Stuckey, the mother of his three children, whom he had married in 1912, Wallace married Iris Calderhead in 1941. Upon his retirement, the Pratts went to live in a ranch house Wallace had built on a property acquired several years earlier in McKittrick Canyon at the foot of the Guadalupe Mountains of west Texas and New Mexico.

He first got interested in the property in 1921. "I had been told simply that it was the most beautiful spot in Texas," he recalled, "so I drove 100-odd miles in an old Model-T to see for myself and it seemed to me that it probably was. So, over a period of years and largely with borrowed money, I gradually achieved full ownership of McKittrick Canyon and its surrounding acreage." Even though originally his interest in the property was purely esthetic, its unusual geological significance soon became apparent to him: the canyon displayed one of the most spectacular exposures of an exhumed barrier reef complex anywhere in the world.

For 15 years Pratt and his wife lived in McKittrick Canyon, without a telephone and 60 miles from the nearest post office. The first home was built in the canyon in 1930, but a heavy rainfall in 1943 flooded the canyon and left the Pratts isolated for a week. In 1945, at the end of World War II, they built a second home at the mouth of the canyon.

A pilot since 1933, Pratt often flew his single-engine plane in his many trips around the country to points as far as New York and Alaska. He frequently commuted by air to Carlsbad, New Mexico, where he had an office. He did not give up flying until he was 76, and very reluctantly at that.

The years in McKittrick Canyon restored Wallace Pratt's health—indeed, he would live to be 96. He pursued some private consulting activities and served in a number of part-time private and official capacities—he was, for instance, special assistant to the chairman of the National Security Resources Board in Washington in 1948. He traveled, he lectured some, but most importantly he had time to think. These were his most reflective, philosophical years.

Some of his more significant thoughts, particularly those concerning petroleum geology, had been expressed in some of his many earlier publications. In his priceless little book, *Oil in the Earth*, based on four lectures delivered before the students of the Department of Geology of the University of Kansas on March 17 to 19, 1941, he had already advanced the fundamental view that *hydrocarbons are normal constituents of marine sedimentary rocks*, a view that has profoundly influenced exploration for oil and gas since then. In the same volume, he also expressed in his own articulate manner a thought which he would repeat many times and in

many different ways: "*Where oil really is, then, in the final analysis, is in our own heads!*"

But, in my opinion, the most brilliant expression of Wallace Pratt's views concerning petroleum exploration was contained in a paper that he delivered in Austin, Texas, in October 1951, at the 18th annual meeting of the South Texas Geological Society.

The paper was originally titled "A Philosophy of Oil-Finding" but was later changed to "Toward a Philosophy of Oil-Finding." The ideas expressed in this paper are as valid today as they were 31 years ago! It should be read and re-read many times by every petroleum geologist in the world! The original version of the paper was not formally published but a shorter, revised version appeared in the *AAPG Bulletin*, v. 36, no. 12 (December 1952), p. 2231-2236. (The reprint of the paper follows this memorial.)

In that paper, Wallace Pratt combines admirably his views on the occurrence of hydrocarbons in nature, his philosophy of petroleum exploration, and his profound belief in the free enterprise system as the most propitious environment for the discovery of oil and gas reserves. An eternal optimist, he stated that "unless men can believe that there is more oil to be discovered, they will not drill for oil... Where oil is first found, in the final analysis, is in the minds of men. The undiscovered oil field exists only as an idea in the mind of some oil finder. When no man any longer believes more oil is left to be found, no more oil fields will be discovered, but so long as a single oil-finder remains with a mental vision of a new oil field to cherish, ...just so long new oil fields may continue to be discovered." But ideas in the minds of men, Wallace Pratt believed firmly, can only be translated into the discovery of new fields in the proper political and economic environment, where exploration can be "carried on by literally thousands of independent enterprises; thousands of individuals, each an oil finder in his own right; each free to put to the practical test of the drill his own ideas and theories of where oil might be found; and each spurred on to the drilling of exploratory wells by the assurance that if he made a discovery, he would reap a reward commensurate with its value to society." He considered freedom and incentive to explore as essential ingredients for the discovery of new oil fields.

In this paper Wallace Pratt attempts an inquiry "into the fundamental principles which underlie the art of oil finding—the philosophy of this art." He discusses the factors that retard, as well as those that facilitate, oil finding. Perhaps the most formidable obstacle to the discovery of oil, Pratt believed, is "dogma with relation to the occurrence of oil." He advises not to judge what we do not know by what we already know, either in a positive or in a negative way. "We must maintain at all times an acute awareness of what we do not know" and "if, unconsciously, we identify the unknown with unfavorable, and if we explore only the areas we know to be favorable, we leave undiscovered many oil fields." As in common law, "let us presume that an area is favorable until we have really proved it to be unfavorable."

Pratt concludes that "finding oil depends first of all on a proper mental attitude, on the determination to search diligently" and that "the qualities which mark the individual oil-finder" and determine the proper mental attitude toward the unknown "are faith, persistence, the venture spirit, and vision" (in the original version of the paper he mentioned "something very like humility" instead of vision). Wallace Pratt certainly possessed all these qualities.

But great as he was as a petroleum geologist, Wallace

Pratt will be remembered above all as a distinguished philosopher of the science of petroleum.

Wallace Pratt's accomplishments have received the recognition they deserve—he was accorded practically every award and honor that can be presented to a petroleum geologist. He was, in 1945, the first recipient of the American Association of Petroleum Geologists' most prestigious award, the Sidney Powers Medal "in recognition of distinguished and outstanding contributions to and achievements in petroleum geology." The citation read: "For his early and continued contributions to the Art of exploration for oil through application of the Science of Geology and for his advancement of the Profession of Petroleum Geologist through his able and friendly skill as an administrator and executive." In 1948, he was awarded the Anthony F. Lucas Medal by the American Institute of Mining and Metallurgical Engineers; in 1950, Dwight D. Eisenhower, then president of Columbia University, bestowed on him the university's James Forman Kemp Medal; in 1954, he received the American Petroleum Institute's Gold Medal for Distinguished Achievement; and in 1969 he was inducted in the Hall of Fame of the Permian Basin Petroleum Museum in Midland, one of the first 12 petroleum pioneers so acclaimed. In 1972, the American Association of Petroleum Geologists selected him as the first recipient of the Human Needs Award in recognition of his having "given so much of himself to others." The citation emphasized the example he had set and the ideas he had maintained. It read: "He has provided over the years immeasurable inspiration and encouragement to generations of scientists and laymen; he has not only by his professional activities but by personal contribution enriched the resources of the peoples of this nation and of the world." In 1976, he was named the "Grand Old Man of Exploration" by the directors of Tulsa's International Petroleum Exposition. There were many other honors: he was a director of AIME in 1942-1944, a director of API from 1928 to 1934, and honorary member of many scientific and professional societies.

His relationship with the American Association of Petroleum Geologists was a long and distinguished one: he was one of the founders in 1917 of the Southwestern Association of Petroleum Geologists, the predecessor of the AAPG, its fourth president (1920), and the first recipient of the Association's two top awards. He served with distinction on many committees, was one of the earliest Distinguished Lecturers (1946), and in 1957 was elected an honorary member of the Association.

It is significant that the American Association of Petroleum Geologists selected Wallace Pratt as the first recipient of both the Sidney Powers and the Human Needs awards, one for his many and outstanding contributions to the art, science, and business in petroleum exploration, and the other for his selfless and untiring efforts to help and encourage all those with whom he came in contact in his professional or personal life. These are certainly the two aspects of his character that made him the person that he was.

In 1960, so that his wife might receive the therapy she needed for her arthritis, the Pratts moved to Tucson, Arizona, where they had purchased a home at the foot of the Catalina Mountains. After his wife's death in 1966, Wallace Pratt married her closest friend, French-born Suzanne d'Autremont. A great debt of gratitude is owed to Suzanne Pratt. Not only did she and Wallace share a loving companionship, but the devotion with which she cared for him in his last years enabled him to carry on many of his activities even though his failing health made

it impossible to do so with his characteristic vigor.

During his Tucson years, Wallace Pratt read widely in many and diverse fields. But his greatest pleasure was his spirited and prolific correspondence with two generations of friends and colleagues scattered the world over, a correspondence characterized by pointed and intelligent questions on a wide variety of subjects: politics, science, contemporary affairs, petroleum exploration activities, recent articles and books, etc. It was never easy to answer his inquiries, but it was always a stimulating experience. He enjoyed visitors and would take pride in showing them his garden from where he could point to the Catalina Mountains and remark "Those are the oldest rocks in the world. Two and a half billion years old. Imagine! Granite for the most part." And he would recollect how when he was a boy in Kansas he wanted to see granite so badly that he could taste it. "But there is no granite in Kansas..."

Wallace Pratt wrote very well—lucidly, gracefully; he had the unusual ability of treating the most scholarly subjects in simple, direct, and understandable prose.

In the 1970s, his hearing began to fail and his eyes began to bother him. He had inoperable cataracts for the last 20 years of his life. Old pleasures of going to the University of Arizona to hear lectures had to be foregone. During the last 15 years of his life, Wallace Pratt enjoyed the faithful friendship of Laurence Gould, the world-renowned Antarctic glaciologist and explorer, himself retired in Tucson. When Wallace could no longer read, and his enjoyment in life was greatly diminished, Larry would visit him almost daily to read to him his correspondence, newspapers, and a variety of articles. They would converse at length, take drives together, and shared a relationship filled with mutual pleasure and satisfaction. Larry's last visit to Wallace Pratt was on the afternoon of the day he died. He found that, ill as he was, this remarkable man had been dictating letters until late the night before. His mind never ceased to function despite his physical decline.

Wallace Pratt was slight of build and gentle of manner—"a never prepossessing 115-pound Kansas Yankee" he would say. But his intellect, character, and personality belied his stature. He influenced everything he touched and inspired all who came in contact with him. His foresight was impressive: in 1927 he already had considered the eventual inevitability of producing synthetic liquid fuels from coal, and in 1935 he discussed oil imports and the need for energy conservation. In 1944 he predicted the discovery of important oil deposits in the North Slope of Alaska, and in 1947 he dwelt at length on the existence of oil and gas in enormous quantities in the continental shelves of the world. His early estimates of the ultimate oil resources of the United States were considered wildly optimistic, but have turned out to be much closer to reality than many made in the following 40 years. He discussed the eventual use of solar energy long before it began to receive the wide attention given to it today.

Wallace Pratt was a modest man. He attributed his success to the excellent people with whom he had been associated and to being in the right place at the right time. The response to his selection as the Sidney Powers medalist exemplifies his humility:

When scientists single out one of their fellows for an award of this kind, it is their science, itself, which they really honor. Achievement commonly springs from the sum total of the efforts of all the workers who make up the science. An award to the individual scientist testifies principally to the advance of his science at large.

If Wallace Pratt had indeed been in the right place at the

right time, he certainly was the right man to be there—the man who through his many talents knew what to do and how to best take advantage of the opportunities he saw.

He recognized the need to encourage the development of professional societies, particularly the AAPG, and to support educational institutions. He gave generously to both. Over the years, his alma mater, the University of

Kansas, benefited from his gifts, among which was the establishment of the Merrill W. Haas Chair in Geology.

Wallace Pratt considered himself lucky. As he said many times, “it has been my marvellous good fortune that my avocation has been my vocation.” Perhaps nowhere is his contentment with his long and interesting life better expressed than in a poem written on the Fourth of July, 1975, to his wife:

To Suzanne
If I should ever die (fat chance!)

If I should ever die, Suzanne,
I beg you, do not cry.
Reflect—if I should ever die
That death's a privilege for man.

Dead, I shall more contented be
Than living mortals mostly are.
Permit no moaning at the bar
When I put out to sea.

Please have no funeral service read
Instead, cremate the corpus left behind.
The world to me was always kind
It will not change now I am dead.

But buy no fancy hard-wood urn
For my ashes; a paper sack
To earth will safely bear them back
From dust we came; to dust return.

The Guadalupe's wild west wind
Will spread them for you, evenly.
No ceremony need there be
To save my soul, if I have sinned.

Following his wishes, Wallace's ashes were scattered on the Pratt ranch, near McKittrick Canyon, where those of Iris, his second wife, are also dispersed. Perhaps in anticipation of this and to assure the preservation of this magnificent locality, Wallace had donated, as an outright gift to the nation, 5,632 acres to the National Park Service to form, with 72,000 adjacent acres acquired by the Park Service, the Southwest's newest national park—the Guadalupe Mountains National Park. It will be a fitting and eternal monument to Wallace Pratt.

Not long before he died, Wallace wrote me a postcard, the last of our many exchanges of correspondence. His farewell on this last card expresses the wishes of all of us for him now: “Vaya con Dios,” Wallace.

Wallace Pratt is survived by his wife, Suzanne, a son, Fletcher, 12 grandchildren, and nine great-grandchildren.

Anyone who had correspondence with Wallace Pratt is asked by the AAPG Executive Committee to submit copies for possible inclusion in a biography. Material should be sent to the attention of Merle Noel at AAPG Headquarters in Tulsa.

Editor's Note: Wallace E. Pratt's paper, “Toward a Philosophy of Oil-Finding,” is reproduced here as it appeared in the *AAPG Bulletin* in 1952. His widely quoted statement, “Where oil is first found, in the final analysis, is in the minds of men,” appears in this paper.

Honorees

Adebayo (Bayo) Akimpelu



Career History

Born April 11, 1946

1973	BS (Hons) Geology, University of Ibadan, Ibadan Nigeria
1973	Various positions in Gulf Oil Corporation in Nigeria and New Orleans
1981	Regional Geologist Gulf Oil, Gulf Oil New Orleans
1983	Senior Regional Geologist, Gulf Oil Nigeria
1986	Chief Development Geologist, Gulf Oil Nigeria
1988	Manager Development Geology, Chevron Nigeria
1991	Geological Consultant, Chevron, San Ramon CA
1994	Manager, Exploration Evaluation, Chevron Nigeria
1996	Exploration General Manager, Chevron Nigeria
2002	Shelf Exploration Manager
2005	Director, Government Relations, Chevron Nigeria
2006–2015	Various board positions with several companies in Nigeria

My Proudest Accomplishment

My most cherished and significant experience was when I led a team to negotiate some deep water and frontier inland basin acreages with Nigeria's Department of Petroleum Resources in 1995. We did not quite anticipate the strength of the group we were meeting with.

They had a formidable, if not intimidating, team including an attorney, an economist, and a bunch of high-ranking geologists and engineers. I was untested in that sort of business. We had a great basin evaluation and economic modelling group in our California headquarters that had sent me several scenarios of parameters that could yield particular outcomes, some good and some deal killers. It was imperative that without certain back-away clauses in the terms, most scenarios would not be tolerable enough for management approval. Well I was there without the complement of legal, economic, or environmental specialists. I did not realize I needed those experts to carry out such intricate negotiations. There was no live interactive technology then to check your position on any unforeseen scenarios. At that time, the modeling system was a main frame computer at headquarters with dedicated high-power users and experts. I learned a lot of exploration business, negotiating skills, and how to think fast on my feet in a short time. I decided to bluff my way into everyone's consciousness without giving away my relatively limited exposure to lease negotiation. Somehow, I got the upper hand and was able to dictate the pace and direction of the discussion. At the end, I got terms into our contract that made other major companies demand for the same terms "you gave to Chevron." I negotiated some significant back-away options that significantly lowered our exposure and these options helped a reluctant management come on board. The "feel good" from this subsequently opened many doors for me.

My Biggest Disappointment

Under my watch as manager of development geology, we drilled a "simple" development well to increase offtake from a reservoir that had produced over 5 Mbbl from one well and still producing over 2000 BOPD without major pressure drawdown. It was obvious the

“tank” was bigger than we thought. The maps we relied on were from newly acquired 3D seismic. Very routine indeed until the wellsite geologist called on the SSB radio then to report “the hole is dry.” “It cannot be,” I shouted back in disbelief. I quickly checked the coordinates and everything else I could think of, but this was as dry a hole as can be. The corridor was full of all sorts of verbal jabs—“Did you just drill a dry hole in the middle of the biggest oil field in the company?” It was embarrassing! I don’t know if anyone ever found out why the well was dry, but we never did before I retired.

Anecdotal Story

A young geologist was showing me his new prospect. I was patient and attentive but realized the prospect was small. So, I just patted him in the back and said the usual “good job.” Later, he came to my room and challenged me. “You did not seem impressed with my new prospect.” I protested, but then went on to tell him a few things about size of the prospect, and the expected size for a find to be successful. I told him that the prospect was not likely to be an economic success. I implored

him to look harder and find the elephants. He quickly countered “Where can we find them?” For want of something to say, I said “They are all over there, you have to create them. You have the skill sets, you have the technology and you have the support group to collaborate with you. So go find them!” He did not like the word “create” but I think he learned a lesson or two and still refers to that conversation today. I learned a few lessons too.

My Advice to You

I once told a young lady during her orientation about our training program—the intensity and total focus required to go through it. Then I told her that it will constitute about 10 percent of the training, skills, and knowledge needed to find and develop oil. I said the 90 percent remaining will be acquired through mentoring, peer collaboration, on-the-job training, and self-paced learning and reading. That is still my advice to you today. There are still tremendous resources out there to be discovered. Whether in this bad oil price era or otherwise, the world still needs you to find the energy to propel our economies.

Peter W. Baillie



Career History

Born 1949

- 1970 BS degree, Geology, University of Tasmania (Australia)
- 1988 MS (Hons) degree, Sedimentology

- and Basin Analysis, Macquarie University (NSW, Australia)
- 1970 Department of Mines, Tasmania
- 1993 Department of Minerals & Energy, Western Australia
- 1997 TGS-NOPEC Geophysical Company, Perth, Western Australia
- 2009 GeoData Ventures, Singapore
- 2012 CGG (2012–2016 Singapore, 2016–Perth, Western Australia)

My Proudest Accomplishment

“Discovery” of the previously unknown Mannar Basin, located offshore in deep water between south India and Sri Lanka—believed to be the only Mesozoic basin “found” in the 21st century. Based on tectonic modelling and reevaluation of old data, I had predicted the presence of a thick Mesozoic section in an area where previous work had suggested the presence of shallow basement. TGS management

had the faith and confidence to allocate resources to conduct a reconnaissance seismic survey which proved me right.

The basin was subsequently opened to exploration and the first two wells drilled were discoveries—sadly, uneconomic.

My Biggest Disappointment

I have really enjoyed my work, making a career of doing something I love and can't say I have had a biggest professional disappointment.

The loss of good people during downturns in our cyclic industry is always personally disappointing.

Anecdotal Story

Tasmania is an island (about the same size as Ireland or Sri Lanka) and air traffic is very much the main form of transport to and from other parts of Australia.

I became involved in professional societies early in my career and, in particular, the running of conferences. In 1988 (then aged 38) I was appointed Convener of the 10th Australian Geological Convention which was to be held in Hobart (the capital of the Australian State of Tasmania) in February 1990. I formed a committee and we started planning for this big national event.

Planning proceeded smoothly until August 1989 when commercial air traffic in Australia ceased. What followed was one of the worst, most expensive, and dramatic industrial disputes in Australia's history.

The dispute severely disrupted domestic air travel in Australia and had a major detrimental impact on tourism and many other businesses. It threw our plans into chaos as we did not know if delegates could travel to Tasmania.

The Royal Australian Air Force provided some limited domestic air services at the time to ease the impact of the strike with some overseas airlines operating charters in east coast routes, and travel between Perth and Sydney via Singapore using international flights.

Without air transport the convention was toast, and I invite readers to imagine the stress involved in planning a national convention, dependent on air transport (at a time when there is none), nor any end in sight to the dispute responsible for the shutdown. The dispute eventually ran into the early part of 1990, with normal traffic resuming about a month before the convention commenced.

Phew!

My Advice to You

Be involved in professional societies and give back something to the profession. Geology is fun—enjoy it!

Albert W. Bally



Career History

Born April 21, 1925

1952	PhD University of Zürich (Switzerland)
1954	Fellowship at Lamont Geological Observatory, Columbia University
1954	Geologist, Shell Canada, Calgary
1963	Chief Geologist, Shell Canada, Calgary
1966	Manager of Geological Research, Shell Development, Houston
1968	Chief Geologist, Shell Oil U.S.A.
1975	Exploration Consultant and Sr. Exploration Consultant, Shell Oil U.S.A.
1981	Harry Carrothers Weiss Prof. of Geology and Chairman of the Department of Geology at Rice University, Houston
1996	Prof. Emeritus, Department of Earth Sciences at Rice University, Houston

My Proudest Achievements

Early in my career I was a member of the Shell Canada team that discovered the Water-ton and East Jumping Pound Gas fields in the Southern Alberta Foothills. Both are still producing for Shell Canada today (over 50 years later!). I was also coauthor of the 1966 paper on “Structure, Seismic Data and Orogenic Evolution in the Southern Canadian Rocky Mountains.”

In the early 1970s, Shell consolidated Headquarters, Area, and Division offices in the U.S. to only Houston and New Orleans. In that context, I asked Ted Cook to lead a team

of stratigraphic experts to compile a Stratigraphic Atlas of North America. The project was completed in the early 1970s and published in 1975 by Princeton University Press.

In 1980, as a member of the American Plate Tectonics delegation to China, I coauthored a Report on the Geology of Tibet that initiated the cooperation of many foreign geoscientists with their colleagues in China. In 1986, I led a Sedimentary Basin Delegation to the People’s Republic in China and prepared the report on that visit. These early visits evolved into my own cooperation as a consultant with Chinese Petroleum Companies and their geoscientists, which lasted over 25 years. While giving courses on seismic interpretation and consulting for them, I had a unique opportunity to review all the sedimentary basins of China in substantial detail.

In 1981, soon after joining Rice University as Chairman of their Geology Department, I happened to meet Ron Hart of the AAPG and suggested a Seismic Atlas project. The AAPG promptly supported the idea. I assembled and edited three Seismic Expression of Structural Styles volumes that were published in 1983. They were followed in 1998–89 by three Atlas Volumes on Seismic Stratigraphy. An unusual understanding with all contributors was our assurance that their contributions would not be peer-reviewed, as long as they provided an uninterpreted copy of their seismic profiles to support their interpreted profiles. The oblong format of Atlas volumes was designed to fit in standard file drawers.

Finally, as a member of the Geological Society of America, I proposed GSA’s Decade of North America Centennial project. I was President of the GSA when we celebrated the society’s Centennial meeting in Denver. Together with Pete Palmer, I coedited the first volume of their DNAG series.

My Biggest Disappointment

None! The many dry holes I “cosponsored” are filed in my mind as “lessons learned.”

Anecdotal Story

In the spring of 1949 while working on my PhD thesis, Eduard Trümpy, a geologist working for Gulf Oil, asked me to map the Ragusa plateau of southeast Sicily. We stopped in Rome where we had a meeting in the Albergo Ambasciatori with Avvocato N. Pignatelli, who represented Gulf in Italy, and J. Elmer Thomas, who had passed on to Gulf a large exploration permit that he obtained from the then autonomous government of Sicily. Not being fluent in English, Trümpy translated my question to Elmer Thomas: “Why did you acquire an exploration permit in Sicily?” I will always remember his reply: “Young man, this was easy. All you need to do is to find out what the regional dip is. When you find reversals on the dip you take out the acreage.” I trust that Elmer Thomas was also aware of the asphalt mine in Ragusa.

Based in Ragusa I spent a long hot summer in southeast Sicily mapping the many

structures and faults of that area, to measure stratigraphic sections and, as I was familiar with macro foraminifera, I was also able to make some preliminary age determinations. At the end of the summer, together with Trümpy, we listed and prioritized several structures. The Ragusa structure was ranked on top of our list because it was associated with the asphalt mines. In the fall, upon my return to Switzerland, I prepared a report on the micropaleontology of the samples that I brought back from Sicily.

Eventually, following additional seismic work, in the fall of 1953 the Ragusa oil field was discovered in a lower Jurassic/upper Triassic reservoir. Alas, J. Elmer Thomas had passed away late in 1949!

My Advice to You

As a geologist, enjoy your profession and pass on your experience to younger generations of earth scientists.

Kevin M. Bohacs



Career History

1976	BS (Honors) in Geology (Summa cum laude), University of Connecticut
1981	SD in Experimental Sedimentology, Massachusetts Institute of Technology
1981	Joined Exxon Production Research Company, Clastic Facies and Stratigraphy group
1984	Began work with Petroleum Geochemistry group and

1999–2000	Hydrocarbon Systems Analysis AAPG Distinguished Lecturer
2004	Fellow, Geological Society of America
2005	Corporate Award for Excellence in Environmental Stewardship from Division of Environmental Geosciences, AAPG, for coauthoring “Field Safety in Uncontrolled Environments”
2013	I.C. Russell Award from Geological Society of America
2014	Robert R. Berg Outstanding Research Award, AAPG
2007–2009	AAPG Distinguished Instructor

My Proudest Accomplishments

I would like to list several “proudest accomplishments,” including:

- Being blessed to spend 35 years working with really smart people, helping to develop techniques for sequence stratigraphy in outcrops, cores, and well logs of coarse- and fine-grained rocks, adding process-based approaches, and keeping the geo- in geochemistry, while doing field work on six continents and 27 countries,

enabled to be a technical leader with minimal administrative responsibilities.

- Helping keep field research alive and robust by leading the development and implementation of our Field Safety Process, and sharing it with our profession by coauthoring “Field Safety in Uncontrolled Environments” (AAPG best seller) and teaching Field Safety Leadership short courses.
- Leading the development of comprehensive integrated geological-geochemical models for hydrocarbon source rocks and lake depositional systems, and seeing those insights applied to find oil, aid shale-gas/tight-oil development (with all its environmental and economic benefits), and as a tiny part of selecting, exploring, and interpreting the geology of Gale Crater, Mars.

My Biggest Disappointment

My greatest disappointment is that many geologists have not fully incorporated into their world view how complex, yet systematically varying mudstones are—this, despite all the work that has been done on this subject, even before the “shale-gas revolution.” Many are willing to accept the complexity of mudstones intellectually, but it does not appear to have translated widely into changed behavior. To be sure, we have seen a change in attitudes over the years, but it seems that it’s mostly been from “mudstones are simple, they are all the same—treat them statistically” to “mudstones are incredibly complex, they are all different and too hard to figure out—treat them all statistically.” I would contend that just as, in detail, all coarse-grained reservoirs are different but do occur in distinct families (deltas, submarine fans, reefs, mounds, etc.), so it is for mudstones. Mudstones/shales occur in a limited number of genetically related groups that are quite closely related to their hydrocarbon play properties and distribution. The organizations that appreciate this, and act according to what they have learned, tend to prosper. Mudstones are so complex that we all need to learn from each other to help us be more effective, efficient, and environmentally sound in how we recover resources.

Anecdotal Story

How the Corporation approached deepwater opportunities in the South Atlantic illustrates how applying hydrocarbon-system fundamentals innovatively with patience and persistence over more than a decade led to discoveries that “shocked the oil industry since finding oil so far off the coast and in a new geological formation was totally unexpected.” (Koning, 2012, *GeoExPro* magazine).

It all began toward the end of the 1970s oil boom, when the Corporation concluded that most of our dry holes could be attributed to hydrocarbon-systems failures, and most of those to source-rock presence and adequacy. In 1984, we began an integrated study to characterize effective source rocks from plate-tectonic setting down to molecular geochemistry (I helped with the sedimentology and sequence stratigraphy). We applied the findings of that study in a series of regional studies over the next few years, one of which identified the potential of the deepwater South Atlantic, especially for a marine source and deepwater clastic reservoirs deep offshore Angola. This advice was not met with universal acclaim, for the established plays onshore and nearshore had a lacustrine source and shallow-water carbonate reservoirs—and there were no significant finds farther offshore despite numerous wells. I recall hearing such comments about the deep offshore (>1,000 ft water depth) as: “It’s too deep for source,” “It’s too far out for sand to reach,” “Bring it back when the water is shallower, because we will never be able to drill there economically,” and (my personal favorite) “I’ll drink all the oil you find in the deep.”

Now, finding a prospect is like buying a house: you’re looking for the right house on the right street in the right neighborhood. The regional study had identified the right neighborhood, now to find the right street—one with a functioning hydrocarbon system—so we could plan 3D seismic surveys to locate the right house/prospect. We started with evaluating source-rock character and distribution, but there were very few wells with source-rock samples and certainly none in the prospective area. However, as part of our initial

study of source-rock fundamentals, we had experimented with mapping source rocks using 2D seismic and had presented that approach at several reviews. Early in 1990, my research team received a call from the exploration team, whose leader said, more or less: “OK, college kids, come on out and try your magic to help us select blocks to bid on.” Working with exploration geophysicists, geologists, and geochemists, we took our outcrop and subsurface research on source-rock character and stratigraphy, modelled possible seismic responses, and interpreted and mapped seismic facies of potential sources on a broad 2D seismic grid. Our interpretation indicated that the areas that later would be designated as Blocks 15, 17, 31, 32, and 33 looked most promising, with Block 16 a lot more challenged.

These results contributed to an urgently pursued acreage acquisition and participation strategy that resulted in the substantial acreage holdings of ExxonMobil’s Angolan subsidiaries in the Congo, Kwanza, and Benguela Basins. Six years later, Elf (as operator) discovered the giant Girassol oil field on the second well drilled on Block 17. Two years after that, in early 1998, the first exploration well on Block 15 (Exxon operated) discovered the Kizomba giant oil field. By the end of 2004 (20 years after the initial foundational studies), ExxonMobil subsidiaries had explored 11 deep-water blocks covering about 53,000 km² (13 MM ac) offshore Angola and discovered more than 7.5 Bbbl of oil.

Our keys to success included starting with the fundamentals of the hydrocarbon system, entering early, keeping our aperture of knowledge open wide at the beginning to produce the best long-term choices, and being patient and persistent.

My Advice to You

- Listen to the rocks. Be open to being surprised, humble in the face of nature, and don’t be afraid to be wrong—and admit it.
- Always base your discovery thinking—conventional and unconventional—on hydrocarbon charge: source, maturation, migration. You can’t sell holes in rocks—

porosity and permeability are nice, but hydrocarbons of values are better.

- Get out on the outcrop, go to the core warehouse, examine a lot of rocks, and integrate those observations with microscopic, geochemical, and paleontological analyses. Write up what you discover. Writing down your thoughts and having them flayed open by reviewers does wonders for clarifying your thinking and increasing your understanding (along with thickening your skin).
- We are in the oil business to make money, not just find oil. It’s easy to fall in love with beautiful geological models—careful economic assessment can reveal which one is worth pursuing.
- Mudstone/shale constitutes about 80% of the stratigraphic record. A lot of the answers to the geological questions you ask can be found by looking at the fine-grained rocks.

Steve Brachman



Career History

Born 1955, Chicago, Illinois

1978	BS Geology, Eastern Illinois University
1983	MS Geology, Penn State University
1981	Gulf Oil Company, Geologist
1984	SOHIO Petroleum Company, Geologist
1988	BP Exploration, Geologist
1990	Wintershall, Geologist
1991	Independent Consultant
1992	Araxas Exploration, Geologist
1995	Southwestern Energy, Geologist
1997	Pogo Producing Company, Division Geologist
2007	Petro-Hunt, LLC, Exploration Manager
2013	Wapiti Energy, LLC, VP Development and Geoscience

My Proudest Accomplishments

Two moments especially stand out, for me. First, as General Chair of the 2014 AAPG Annual Convention (ACE) in Houston, I was privileged to work alongside a great team of volunteers and headquarters staff. Together, we provided leadership and managed one of AAPG's most successful annual conventions.

The second proud moment that comes to mind also involved working with a great team. Several years ago, I managed the Houston office for a privately held, family-owned, independent oil company, headquartered in Dallas. Our job was to develop deep gas pros-

pects in South Louisiana and the Texas Gulf Coast. When natural gas prices cratered in 2009, our office was given an ultimatum: either generate new, liquid-rich exploration plays or face closure. In a relatively short time frame, our staff, with the support of headquarters G&G folks, learned new concepts and worked as a united team to develop several new plays in areas where we previously had no experience. I remember repeatedly rehearsing my presentation and praying during the drive from Houston to the company's Dallas headquarters. The actual presentation to the company ownership lasted six grueling hours and did not go smoothly. They had generations of experience in the oil and gas business, and were very critical of many of our ideas, concepts, and technical work. But four of the plays our team developed were so technically superior, creative, and sufficiently sweeping in scope that they won approval from the owners. The successful pursuit of those projects completely engaged the Houston staff for the next 6 years. I am proud to have worked with and fought for that great team of geologists and geophysicists.

My Biggest Disappointment

Personally, I find disappointments far more instructive than successes. I guess one reason is, at least in exploration, we have greater experience with disappointments. But another reason is that I believe success tends to engender a false sense of security and knowledge.

This particular disappointment of mine was a dry hole that I drilled in South Louisiana. While this was not my first nor my last dry hole, this one was extra-special because I doggedly pursued the prospect over a span of nearly eight years and three different companies. I leased the acreage twice, and purchased the same 2D seismic lines, three times. This prospect was a slam-dunk! Not only was the G&G rock-solid, but the land owner had his Padre sprinkle holy water on the surface location! It couldn't miss. The end result, of course, was that I was so wrong on the geol-

ogy I could not correlate the mud log to the offset wells while we were drilling. The resulting wireline log is a lasting monument to personal humility. I mourned like I had lost my best friend. I had heard the adage, “do not fall in love with your own prospect.” I had the opportunity to learn, first-hand, a lesson in objectivity.

Anecdotal Story

Being in the oil and gas business for 35 years means that I have many anecdotes, a few short stories, and several tawdry novels I could contribute. One of my favorite anecdotes involved a certain consulting geophysicist. This particular consultant and I worked together to generate a prospect in the good-old days of 2D seismic. The prospect had several objectives and was trapped within a 600-acre fault closure. My company leased the prospect and searched for partners. One day, the Exploration Manager for a company not located in Houston called and mentioned that he had received an Executive Summary of our prospect and wanted to review it. The only problem was that he did not know a geophysi-

cist in Houston to help him with the review. I mentioned several to him, but when asked for a recommendation, I confessed that the best geophysical consultant I knew was the one who helped me generate the prospect. “Not a problem,” was the reply. So, the Exploration Manager arrived in Houston and, along with our consulting geophysicist, remapped the prospect. Imagine my surprise, a week later, when the Exploration Manager called to reject the prospect because the fault closure was too small; only 300 acres. Furiously, I called the consultant and demanded to know why there was such a large discrepancy in the two maps he made. The geophysicist calmly replied in his west Texas drawl, “Well Steve, his was a buyer’s map, while yours was a seller’s map”!

My Advice to You

I find giving advice a bit daunting, because what works for one person may not be appropriate for another. In general, though, I think that the more you keep learning and the more people you get to know in your profession, the greater your opportunity for personal growth and professional success.

Bob Cassie



Career History

Born 1957, Sydney, Australia

1978	BS (Hons) Geology and Geophysics, University of Sydney
1979	Esso Australia Limited, Sydney
1984	Ampolex Limited, various exploration and management roles

1997	in Sydney, Denver and Perth Mobil E&P Australia, Perth, deepwater exploration, PNG development.
2000	CSIRO Petroleum Division, Perth
2002	Hardman Resources Limited, Perth, Africa Asset Manager and Exploration Manager
2006	Consultant
2007	Tap Oil Limited, Perth, New Ventures Manager
2012	Jacka Resources Limited, Perth, advisor to the Board, then Managing Director
2015	Consultant

My Proudest Accomplishment

I’m proud to have been part of several great projects and companies, but my proudest achievement was leading Hardman’s exploration in Uganda and finding the first oil fields in the East African Rift. Hardman was a very small Australian company, but we were prepared to be bold, take a different approach,

and successfully opened up a basin that now has 1.7 Bbbl of oil resources and is heading for development.

My Biggest Disappointment

My biggest disappointment is that the two best companies I worked for, Ampolex and Hardman, were both purchased by larger international companies and no longer exist. Maintaining independence is a problem that comes with success for smaller companies. I'm proud that both those companies and the people who worked in them are remembered well, not just for what they did but for how they did it.

Anecdotal Story

When I first looked at the Uganda project, a large block on and around Lake Albert, I thought it was maybe a bit too crazy, but on closer examination the combination of good oil seeps in a rift basin with an apparently thick sedimentary section looked a lot more exciting.

A “standard industry program” was prohibitively expensive so we recorded the first seismic survey on Lake Albert in conjunction with a research team from Syracuse University. We installed a small seismic system on a fishing boat that was transported overland from Lake Victoria. After a few false starts (including getting the boat stuck on a sandbar) we had a 1,600-km regional survey that showed a large downthrown fault trap near the lakeshore that could possibly be drilled from onshore. The prospect needed some transition zone seismic to tie down the fault. We extended the survey further onshore where we found similar but smaller prospects along the rift bounding fault.

A lot of debate within the team and management followed, but in the end we decided the critical step was not to go for a big hit but to prove the basin worked. A simple, vertical onshore well that could be drilled with a rig already in the region was better than a technically difficult, deviated well to an offshore target. It was critical that we drilled a well that could reach the target at reasonable cost and, hopefully, find oil in a good reservoir

even if the initial discovery was smaller than the “economic threshold.” For an unexplored basin in the middle of Africa, economics were at best “rubbery” anyway!

The final decision was which onshore prospect? One had seeps but seal risk from complicated faulting, while the other was a simple structure but had no surface seeps and questionable migration paths. Our Board and JV partner accepted our recommendation—“We shouldn't die wondering, let's drill both.” The first well, Mputa-1, was spudded in late 2005. I remember taking the wellsite geologist's call on a summer Sunday afternoon in Perth, as some of the Hardman team were gathered at my home for a barbecue. The good news could not have been better timed!

Both those first wells were successes. Hardman was purchased later in 2006 by our partner, Tullow, and subsequently more than 80 wells have been drilled in the basin with a success rate of 84%, to find 1.7 Bbbl of oil resources.

My Advice to You

Be prepared to take on different or unusual projects. Always look carefully at what you know and then envisage what is needed to have a discovery. Plan your exploration program to eliminate the biggest unknowns for the lowest cost. If the play still holds up there will be a point when only the drill will decide. Don't get talked out of the project (or talk yourself out of it) too early. You need to be “plausibly optimistic.”

For your personal development, try to find good people to work with who are prepared to share their knowledge and experience with you. These people may be in any of the disciplines—geology, engineering, commercial, law, management, etc. Make the most of those opportunities to learn and then make sure you offer those same opportunities to others.

Charles A. (Chuck) Caughey



Career History

1969	BS Geology with Honors, The University of Texas at Austin
1970	US Army, Sergeant—Light Weapons Infantry
1972	MA Geology, The University of Texas at Austin
1973	Conoco, Ponca City and Lafayette
1976	Inexco Oil (acquired by LL&E), Lafayette and Houston
1989	Valence Operating Company, Houston
1989–2000	Asamera/Gulf Canada (acquired by ConocoPhillips), Jakarta and Houston
2010-2015	Noble Energy, Houston

My Proudest Accomplishments

I know well the disappointment of dry holes, and I have been fortunate to enjoy the thrill of oil and gas discoveries. But I am proudest of accomplishments by geoscience students and early career professionals whom I have mentored. My work with students started early in my career, making K-12 geoscience presentations for the Houston Geological Society. After starting with my children's schools, I asked HGS for more challenging assignments. I made geoscience presentations at schools in low-income areas, then I took the HGS rock and fossil collection to enthrall some surly teens at the juvenile detention center. Through all this I learned that kids are kids—no matter their ethnicity or background, they can be captivated by rocks and fossils.

During an international assignment in Jakarta, I traveled through much of the Indonesian archipelago meeting on campus with students and faculty as an AAPG Visiting Geoscientist. This led to establishing 11 very energetic AAPG student chapters, and assisting in their activities by AAPG student programs and with support from local oil companies. I encouraged and helped Indonesian students to apply for geoscience and engineering scholarships in Europe and the US. Many were successful, and these—and later Iraqi scholarship recipients whom I mentored—all achieved high academic success while gaining the needed proficiency in English, Dutch, or French as a 2nd, 3rd, or 4th language. It has been a joy to meet again many of these former students, who are now accomplished earth scientists and engineers.

My Biggest Disappointment

The biggest disappointment of my career came the day my entire professional staff lost their jobs. As exploration manager for Inexco's Houston division, I directed talented staff and enjoyed management support in making oil and gas discoveries across the Permian Basin, Gulf Coast, East Texas, and state waters. Great fun while it lasted. Following these halcyon days, oil price declines in the mid-1980s led to inevitable slowdowns, buyouts, and layoffs across the industry. LL&E (Louisiana Land & Exploration) took over Inexco in 1986, and management arrived at my Houston division shortly afterward to announce staff reductions. They opened a notebook to show me which professionals LL&E would retain, and there was only one name—mine. LL&E retained me for a couple of years, making small oil and gas discoveries in SE New Mexico, then they let me go with yet another staff reduction in 1988.

Following months of diligent searching as an unemployed geologist, I was hired as the only geologist for independent Valence Operating Company. In their office I searched mature fields for bypassed pay and deeper potential, and in the field I scouted locations

of old well heads, supervised swabbing operations, and witnessed logging and perforating. I also prepared government exhibits and served as an expert witness. This basic “nuts and bolts” experience with Valence has been invaluable to me ever since.

Anecdotal Story

Shortly after losing my LL&E job in 1988, I presented a paper on a recent Strawn bioherm discovery for the West Texas Geological Society in Midland. The paper led to encore presentations in Roswell and Amarillo, providing me opportunities to search diligently for employment. During an interview in Roswell, I was shown an ad in the *Oil and Gas Journal* for a geologist with Asamera in Jakarta, Indonesia. Having always wanted to work overseas, I responded to the ad—but to no avail. Then the phone rang late one night the following year, and a woman in Indonesia asked if I still wanted the job at Asamera. I took the position and only learned many years later, to my surprise, that the person in Roswell knew the hiring manager at Asamera and had recommended me for the position. An important lesson: networking is vital, and you never know what opportunities may ensue, sometimes much later.

This began an amazing 15-year posting in Jakarta, starting again as geologist and climbing to exploration manager. Across the wilds of Sumatra, I coordinated field work, scouted well locations, checked seismic lines, and supervised well logging. Surface geology was important to interpretation in a highly deformed area with major stratigraphic changes. Previous surface mapping was done by the Dutch in the 1930s, and I had advantages of satellite photos and a helicopter to survey inaccessible mountain terrain.

The triple-canopied rain forest was dark and surprisingly quiet, except for evening monkey calls. Wildlife there is diverse but low in population density. There are dangers, nevertheless, including venomous snakes throughout and crocodiles in the wetlands. In searching to stake a wildcat in rugged terrain of the Barisan Mountains, local surveyor Dharwis and I discovered that the seismic

benchmark was missing. We nevertheless found and staked the well location, amid large tiger paw prints and mounds of elephant dung. I asked Dharwis what happened to the seismic benchmark, a 2-meter steel pipe embedded in concrete that belonged there. “The elephants scratch themselves on those pipes,” Dharwis responded, “and they just took this one with them.”

Later with the well drilling (it was a discovery), I would jog from camp to the rig until Indonesian roughnecks warned me to stop because “the tiger sometimes comes around.” I stopped running and never saw the tiger.

Wildlife was part of everyday life even in the heart of densely populated Jakarta. Chattering monkeys would scamper along the back wall of my house, meter-long monitor lizards occasionally appeared, and we once found two cobras in the back yard. “Tidak apa apa” (no problem) said one of our household staff, who poured salt down the snake hole—and that was the last we saw of the cobras.

My Advice to You

Persistence: Good things rarely come easily, and the scholarship/college degree/position/work assignment/hydrocarbon discovery that you seek comes only to those who stay in the fray.

Versatility: Develop new skills. Change is always coming, so best be prepared. Chase your dream, but always have a backup (or two).

Patience: This is the hardest one for me. In working with administrators in companies and governments, I found that most people really want to do what is right. It may, however, take them (and you) a long time to realize what that really is.

André Coajou



Career History

1963	Ingénieur Civil des Mines (St-Etienne) France
1966	French marines: lieutenant
1968	Sofrémimes-Le Nickel: Project engineer in Paris and New Caledonia
1970	Elf: Geophysicist then Chief Geophysicist in France, Nigeria, Iran, and Colombia
1980	Head of the Africa Department of the new multidisciplinary division
1982	Exploration Manager: Elf Aquitaine in Ireland and Cameroon
1987	Vice President Exploration for Africa (Paris)
1993	Vice President for New Ventures and Negotiations Worldwide (Paris)
1997	General Representative: Elf E & P for Asia Pacific (Singapore)
2001	Atlantic Seahorse, now Styx Energy: Advisor E & P; President (consulting & teaching)

My Proudest Accomplishment

To have convinced (with limited data) my reluctant management, who had previously decided not to remain in the deep offshore of the Gulf of Mexico, to enter the deep offshore of the Gulf of Guinea. This frontier exploration has led to the Bonga and its satellites discoveries (Block 212; Shell-operated), and Usan (Block 222; Elf-operated) in Nigeria. More than 3 Bbbl of reserves found. Girasol, Dalia, Clov, Pazflor, etc. (Block 17; Elf-oper-

ated) in Angola. More than 4 Bbbl of reserves found and 2 Bbbl have already been produced. Subsequently, the development of Girasol and Pazflor received the Distinguished Achievement Award at the OTC 2003 and 2013. In addition, still in the deep offshore, it was quite an accomplishment to have convinced my reluctant management to enter Azerbaijan on Shah Deniz (BP-operated) where we found more than 30 Tcf and some hundred million barrels of condensates. These discoveries are some of the most important of the more than 100 discoveries worldwide I have been associated with.

My Biggest Disappointment

Apart from the Elf takeover by Total (for political reasons) when it should have been the opposite, not to have convinced my management to drill with ARCO the structure of M'Boundi (onshore Congo), where about 1 Bbbl of OIP have been found later by Maurel et Prom.

Anecdotal Story

After retiring from Elf, I was asked by a good friend of mine to prepare a paper for one of the many conferences he organizes. I accepted and proposed: "The mistakes I made, the lessons I learned." My friend is an economist by training and a good marketing man, and he told me "André! You never made mistakes. For that you have to blame the others and take the credit for the discoveries." So, I had to modify my talk, and especially the title, which became: "20 years of errors and surprises." We explorationists know that we cannot always be right and that failures bring experience.

My Advice to You

Work in multidisciplinary teams. You will always be better and more efficient. But keep improving your knowledge and your own technical strength. Be curious about new technologies and concepts. Conferences, associations like AAPG, and joint ventures are good for that, and for developing your network. Don't

hesitate to challenge your management and argue with them (with good arguments of course). But if your management doesn't

accept your proposals, you have to accept the decision.

Jonathan Craig



Career History

1976	University of Nottingham: BS Joint Honours in Geology and Physical Geography
1983	University College of Wales, Aberystwyth: PhD in Structural Geology and Tectonics
1980	Consultant Geologist, Geomorphological Services Ltd., UK
1983	Structural Geologist, Shell Petroleum Development (Tanzania) Ltd, Dar-es-Salaam
1985	Project Geologist, LASMO International
1991	Senior Staff Geologist, LASMO North Sea Plc
1994	Senior Staff Geologist and New Ventures Coordinator, LASMO International Ltd, London
1996	Group Chief Geologist, LASMO plc
2001	Head of Projects and Chief Geologist, Eni-LASMO London Technical Exchange
2003	Prospect Evaluation Manager and Global Exploration Advisor, Eni, Milan
2005	Chief Geologist and Geological Services Manager, Eni, Milan
2008	Head of Regional Geoscience Studies and Exploration Opportunities, Eni, Milan
2010	Vice-President & Strategic Exploration Advisor, Exploration & Unconventional Resources, Eni, Milan
2014	Senior Vice President, Exploration Strategies & Professional Areas, Eni, Milan
2015–2017	AAPG President of the AAPG Europe Region

My Proudest Accomplishment

I have never found an oil or gas field. I have been extremely fortunate, however, to be associated with many teams, and indeed companies, that have. My highlights have included the giant Elephant (now El Feel) Oil Field in the Murzuq Basin of Libya with Lasmo in 1997 (c.700 Mbbl), the supergiant Mamba-Coral Gas Field complex (c. 70 Tcf) in deepwater offshore Mozambique with Eni in 2011–2012, and the supergiant Zohr gas field in the deepwater offshore Egypt (c. 30 Tcf) with Eni in 2015. Nothing beats the thrill of a discovery and being part of the team that made it!

Well, perhaps, just one thing. Years ago, I was fortunate to be involved in setting up at “Schools Programme” in the Indian Himalayan state of Jammu and Kashmir in which we taught the students about oil and gas exploration and production, the global energy market, global climate change and energy efficiency. For the first programme at the University of Jammu, students came from all over the State, some travelling for three days by bus—humbling enough in itself. Some 5 years later, I was sitting in a café in Srinagar in Kashmir, when a young man approached me and said “Dr. Craig, you won't remember me, but I came to your schools programme in Jammu and I was so motivated that I went to university to study geology and have just finished my degree.” That was really rewarding!

I am also very proud to hold “Honorary Professorships” at University College London, the University of Durham, and the University of Jammu, India. These have enabled me to pass on some of my experience and to give something back to the next generation of petroleum geologists.

My Biggest Disappointment

Not many—I have been very lucky. I have spent my working life doing something I love.

I would, perhaps, have liked to play a musical instrument proficiently (there is still time!) and I should certainly have learned to speak Italian more fluently than I do!

Anecdotal story

LASMO's exploration campaign in Block NC174 in the Murzuq Basin in Libya in the mid-1990s was my first real experience of managing a major exploration venture. By the time we spudded our fifth well on the block, without making a commercial discovery, our senior management were getting worried (quite understandably)! As the E1-NC174 well approached the prognosed depth of the main Ordovician reservoir target, the wellsite geologist spotted the first sand in the cuttings and called the coring point. We ran-in with the core barrel to cut the first core in the reservoir and promptly cored 30 ft of black, organic rich Silurian shale—the regional source rock overlying the reservoir, with almost 100% recovery. The wellsite geologist very nearly lost his job for that! When we did reach the reservoir it was, once again, dry.

There was one very large structure left on the far western edge of the block, but we had assigned it a very low probability of success because we couldn't see any way to charge a prospect that was such a long way from our prognosed kitchen area. Much debate followed—nobody was keen to drill a sixth unsuccessful well, but eventually it was decided it was just too big to leave. So, in October 1997, the F1-NC174 well was drilled, resulting in the discovery of the Elephant Field—now the El Feel Field—the largest field discovered in Libya for more than two decades. We had the basin modelling and the migration modelling completely wrong because, at that stage, we didn't realize there was a significant amount of late uplift and inversion of the basin! Never fall into the trap of convincing yourself that your model is right!

...and what about the shale core that nearly cost the wellsite geologist his job? Well, today it is probably the most important source rock data point in the entire North Africa region and a critical competitive advantage in

the evaluation of the potential for unconventional shale gas/shale oil of the basal Silurian “hot” shale source rock across North Africa. Before the “unconventional revolution,” nobody deliberately cored shales! The E1-NC174 core is one of only a few fully cored Silurian source rock sections in the region and it has been subjected to intense and exhaustive biostratigraphic, geochemical, isotopic, and geomechanical analyses. You never know when some piece of geological data might turn out to be invaluable!

My Advice to You

Be curious, ask questions, read widely (but don't believe everything you read!) listen well, understand statistics (and what they hide!), trust your instinct, make your own decisions, try not to make the same mistake twice and, as Mahatma Gandhi said “learn like you will live forever, but live like you will die tomorrow.”

Peter A. Dea



Career History

Born 1953

- 1976 BA in geology, Western State Colorado University
- 1981 MS in geology, University of Montana
- 1982–1991 Exxon Company USA Geologist and supervisory roles in production (Corpus Christi) and exploration (Denver) divisions
- 1993–2001 Barrett Resources Corp. (NYSE:BRR) As CEO and Chairman, fended off hostile takeover attempt by Shell and led auction process to sell to Williams for \$2.8 billion, realizing a 67% premium for Barrett's shareholders. Part of team from 1994–2001 that grew proven reserves from 64 BCFE to 2.1 TCFE; (5+ TCFE unbooked potential); daily production from 25 to 350 MMCFED; and market capitalization from \$200 million to \$2.3 billion. As senior geologist, discovered Cave Gulch field. As VP Exploration, led company into multi-TCF Powder River CBM play. *Wall Street Journal*: BRR had best average compounded annual return to shareholders of 33 major and independent companies 1991-2000.
- 1999 Advanced Management Program, Harvard Business School
- 2001–2006 Western Gas Resources (NYSE:WGR) As CEO and President, led a highly regarded, fully integrated, natural gas company to record operational and

financial levels. Market capitalization grew five-fold in 5 years to the \$5.3 billion value realized in the all-cash 49% premium unsolicited sale to Anadarko in 2006. Delivered 388% return to shareholders and doubled proven reserves and production in 4.5 years. Recognized by Forbes in "Best Managed Companies in America" edition as one of top 10 oil and gas companies in 2005 and 2006. Convinced activist hedge fund manager, and new #1 shareholder, to drop his demands to break up company.

- 2007–2016 Cirque Resources LP, President and CEO, founded and led private E&P company with focus on oil resource play exploration in the Rockies, leading to discoveries in Williston and Denver basins and delivering strong returns to shareholders.
- 2016 Confluence Resources LP, Executive Chairman, raised approximately \$275 MM to start up a new E&P company. Advised on team, strategy, and planning.

My Proudest Accomplishment

I am most proud of forming such a great team in the founding and running of Cirque Resources LP, a private E&P company focused on oil resource play exploration in the Rockies. Cirque assembled many prospects in several basins, leased over 1.4 million acres and drilled several wildcat exploration wells, resulting in discoveries in the Williston and Denver basins and noncommercial results in other basins. Backed by solid investment partners, we applied hard work, perseverance, technical agility, and prudent risk management to deliver superior returns to our shareholders. During this period, I was honored with the Wildcatter of the Year Award in 2009 (following the Rocky Mountain Oil & Gas Hall of Fame in 2005) and inducted into the All-American Wildcatters and The Explorers Club in 2014.

My Biggest Disappointment

At Cirque Resources, after selling our projects in the Williston Basin for substantial profits

relatively early in the horizontal Bakken play, I regret not gutting up by paying up to reenter the basin. With a pure exploration focus we became used to paying entry-level bonuses on 30,000 to 300,000 acre prospects, drilling wells to lift the value and sell for high profits. We should have leveraged off our technical and land expertise, adjusted our strategy to pay more for lower risk development acreage, and retooled our economics to justify higher entry costs, which still would have resulted in superior returns.

Anecdotal Story

When my boss and mentor Bill Barrett peered over my shoulder at the Cave Gulch #1 log gas shows that I had just colored in red, he exclaimed “This looks just like Madden.” Then I knew we had a major discovery. With an IP of 9.7 MMCFD and 117 BCPD, it won Hart’s *Oil & Gas Investor* “Best Well in Rockies Award” in 1994. This was a gutsy test. The targeted Lance Formation stood upright as vertical fins of sandstone at the surface, remnants of a recumbent fold on the leading edge of the Owl Creek thrust. The risk was, could we come out of this vertical dipping allochthonous section at a shallow enough depth to preserve the autochthonous Lance reservoir below the sole of the thrust fault? Over 4,000 ft later, the bit emerged into the normal section with pervasive gas shows. While development drilling quickly ensued, I started to look at the 20,000-ft deep lower Cretaceous section. One major problem: six deep noncommercial wells from the 1980s surrounded the prospect and all mapped out as structurally flat, so no visible structure. My instinct told me there could be a deep structure below the shallow discovery. As a true explorationist, I hand-contoured a series of oblong dashed lines expressing a football shaped anticline (above my flat data points) that I recommended we drill.

Fortunately, big-thinking wildcatters Bill Barrett and Paul Rady each had major discoveries in structurally complex geology and approved the 20,000-ft test. By 1997 we had a deep 10-MMCFD discovery in the Frontier and Dakota, 1,100 structurally high to the off-

set wells. But the real fun began on the next deep well. Moderately “mudded up” for low-permeability rock, we tapped into an over-pressured muddy channel sand with conventional Darcy-type permeability. The Cave Gulch #1-29 promptly blew out and roared with a vengeance at rates estimated at 100 MMCFD. We cobbled the well head back together and produced into a sales line at over 40 MMCFD flat for 6 months before blowing out again. We diverted a deep development well ¾-mile away that was drilling at 2,500 ft into a relief well and geosteered it into the CG #1-29 drillpipe at 18,000 ft to kill the well. A 50-BCF prospect grew to shallow and deep discoveries with estimated reserves of over 500 BCF. Cave Gulch defines a true “company maker” as it also gave BRR additional financial strength and growth visibility to complete a reverse merger with a company twice our size.

Years later, we visited Lloyd’s of London, our insurance syndicator at the time of the blowout. I entered their office a bit sheepishly, yet they greeted us with a hero’s welcome. Unbeknownst to us, Lloyd’s used the CG #1-29 as a case study on the best arising from the worst. Usually their liability is a total loss. In our case, we had many positive offsets to their liability, having sold gas for 6 months after the initial blowout and using a development well in progress as the relief well.

My Advice to You

Life revolves around principles, people, and passions. Integrity supports your foundation. Never allow it to falter. As Cort Dietler told me, “It’s all about the people.” Surround yourself with the best and hire only the best. Seek out mentors and their advice throughout life. They may give you your big breaks. Pursue your passions. Whether the arts, sports, adventures, etc., your passions have already instilled in you discipline, teamwork, leadership, self-confidence, a sharp mind, and a soulful spirit. Leverage off those traits in your career and pursue them for pleasure. There is never a good time to take vacation—so take them regularly to balance your life. Live life

large every day. The American dream starts today, not at retirement.

Acknowledgments

Mentors through life lift our boats in high and low tides. Academic advisors Bruce Bartleson, Bob Curry, Johnnie Moore, and Don Winston taught me how to think creatively. Professional mentors Bill Barrett, Paul Rady, and

Jim Scheihing gave me my big breaks and much more. Community leaders and close friends George Sparks, Dan Ritchie, and John Hickenlooper continue to share their vision and strategy on the gift of giving and community service. My personal guides, wife Cathy, my parents, Steve Monfredo, and Greg Grange instill love, humility, self-confidence, and grounding. Thank you all.

John C. Dolson



Career History

Born 1949

1971	BA, Natural Sciences, The Colorado College
1973	Teaching certificate, University of Colorado
1973–1978	Teacher, Life and Earth Science, Loveland, Colorado
1978	National, regional, state awards, Environmental Conservation Teacher of the Year
1981	MS, Earth Science, Colorado State University
1981	Geologist, Amoco Production Co. (now BP)—Denver, Houston, Egypt, London, Moscow
2006–2007	Served as AAPG Vice President while with TNK-BP in Russia
2008–present	Director, DSP Geosciences and Senior Advisor, Delonex Energy

My Proudest Accomplishments

Marrying my wife Debbie and raising two fine children, Josh and Kristin, gave me the stability and support I needed to achieve many other things I am proud of in my career. Having a family that thrived on my professional and volunteer activities and enjoyed living as

expats in Egypt, London, and Moscow has made all the difference.

As a geologist, my greatest achievement was helping to transform the Gulf of Suez Petroleum Co. (Egypt) from a technological backwater in 1994 to recipient of Amoco's Worldwide Technology Exploration Excellence Award in 1997, when I was Senior Geological Advisor. This effort required transforming the skills sets of hundreds of Egyptian geoscientists from working with paper maps and seismic sections to state-of-the-art integrated workstations and 3D visualization. Over the course of the 8 ½ years I was in Egypt, we found hundreds of millions of barrels of oil in the Gulf of Suez and opened up the deep Mio-Oligocene gas/condensate play in the offshore Nile Delta. Later, I was able to apply those lessons learned to transforming teams in Russia with TNK-BP, where we identified over 3 Bbbl of stratigraphically trapped oil in several giant stratigraphic traps.

As an AAPG member, learning how to work in teams of volunteers was pivotal learning, both personally and professionally. Volunteers have the unique ability to say “no” and abandon a project. Learning to tap into other people's energy is a skill set that has to be practiced and worked at and AAPG gave me the chance to do that. I had several major AAPG projects. In 1989, I worked with four other cofounders of the Friends of Dinosaur Ridge to organize hundreds of AAPG/RMAG volunteers to preserve a dinosaur bone and track site west of Denver, Colorado. Today, this organization attracts over 100,000 visi-

tors annually. In 1994, I helped form the first AAPG Chapter in the Former Soviet Union (Baku, Azerbaijan), a chapter that has remained extraordinarily active under the leadership of Akif Narimanov.

I also helped introduce Egypt to AAPG with a 1998 Hedberg Conference on rifts and the AAPG 2002 Cairo convention. This convention was successful despite being held less than a year after the 9/11 terrorist attack. One of the longer-term outgrowths, through a publication and field trips we made on the Whale Valley area in the Fayoum Depression, and with collaboration of the Egyptian government, was the 2005 establishment of Whale Valley as a UNESCO world heritage site. This unique desert location features superb geological exposures and more than 400 Eocene whale and other fossils lying exposed on the desert floor. Our Egyptian student chapters (there were none in 2001) have also grown tremendously as an outgrowth of these efforts.

Through all of this, my kids and wife got involved and we made many great friendships along the way.

My Biggest Disappointment

I undervalued a wildcat discovery in Egypt's Gulf of Suez in 1994. Our poor seismic made imaging of the trap and reservoir difficult. The discovery well flowed 10,000 BOPD but was offset by two dry holes that failed to find reservoir. In assessing the discovery size, we failed to adequately describe the potential ranges of maximum and minimum volumes and decided not to set a platform, but to produce the pool from expensive long-reach wells from existing platforms. Production data later showed the trap was much larger than the case we presented. The decision not to set a platform was a costly one.

We did learn from this, however. For all future prospects and discoveries, we required "maximum and minimum" maps that showed the full range of potential solutions. That change in process led to our teams eventually predicting within 10% the actual volumes discovered vs. predrill estimates.

Anecdotal Story

While working the Nile Delta in Egypt from 2000–2003, the paradigm in exploration was that the dominant source rock was in the Miocene and there was no source potential in the Oligocene. This paradigm was "proven" by more than 1500 onshore wells that showed no source potential. Offshore, however, there were only four penetrations and none to the middle and lower Oligocene. In addition, pressures in the Oligocene were considered too high to be drillable and the deep reservoirs too tight to be economic. BP/Amoco's exploration was focused almost totally on seismic bright-spot plays in the Pliocene. I was leading and working in a small team of two geophysicists and one petroleum systems modeler doing regional mapping. We challenged the paradigm of Oligocene potential and focused on the deep potential.

Key information flew in the face of conventional wisdom. One of these wells produced oil below the shallow gas pays from an Oligocene turbidite in the uneconomic Tineh Field. Two others contained no reservoir and were under very high pressure. The fourth, the Habbar-1 dry hole, had residual gas shows and a pronounced pressure regression showing favorable drilling conditions and charge. We analyzed thin sections from the Habbar well and discovered 38–41 API gravity oil in fluid inclusions in high-quality, thick Oligocene turbidite channel reservoirs. Regional porosity vs. depth plots showed a deviation off the regional porosity compaction trends of wells with 20–25% porosity occurring at depths more than 4000 meters below mudline that were clearly related to porosity preservation due to overpressure. Equivalent depths in normally pressured reservoirs were tight and noncommercial. The oil shows encountered indicated that there must be deeper source rocks than the Miocene.

The Habbar well had drilled a robust three-way fault trap. Its failure was used to condemn Oligocene potential. We looked at the data and decided it actually proved the potential, by showing adequate reservoir, pressure, and charge. The top seal of the three-way closure was eroded by a major Mes-

sinian unconformity that juxtaposed normally pressured reservoirs over the higher-pressure Oligocene reservoirs. The trap had not failed from charge, but from seal leakage, also explaining the pronounced pressure regression. That interpretation meant that downdip structures that were not eroded would be good targets. We acquired as much acreage as we could on the deep trends once this interpretation was made.

Our first deep test was on another fairway to the west, resulting in the 2003 Raven discovery, a multi-TCF lower Miocene trap that proved the high-quality reservoir and charge

below the known source rock. By 2008, BP had successfully tested the giant Satis Field downdip of the Habbar dry hole, encountering high-quality reservoir, gas condensate and a pressure regression. Subsequent core data confirmed source rock in the Oligocene, analysis of which showed it was the major source of shallower gasses in the eastern Nile Delta. That play has now been extended into the Levant Basin to the east and with multiple deep discoveries in Egypt. Multi-Darcy reservoir has been found at depths in excess of 6 kilometers below mudline.

My Advice to You

- Get involved in AAPG and other volunteer associations and give back to your profession and communities. I have undoubtedly learned more from AAPG friends and mentors than they have learned from me! The returns to you in friendship and learning how to work with people who choose to work with you rather than report to you is invaluable.
- Think “outside the box.” Look at every opportunity as a chance to discover something others have missed. Seek new data to break old ideas. Learn to say “I was wrong.” Great advances in science and exploration aren’t made by people who cling to their paradigms, but to those who can recognize the limits of what they know. Believe in the motto we used at GUPCO: “The map is wrong, it is always wrong; the question is, how wrong is it?”
- Most importantly, cherish your friends and family. Exploring for oil and gas is a difficult business, with many disappointments and failures. Your family and friends will help you through those times and will be there to celebrate when you succeed.
- AAPG and other societies provide an enormous pool of friends and talent. You will become part of a global family through your career and volunteer efforts. Embrace the joy of that experience.

Tony Doré



Career History

1977	PhD in Geology, University College London
1977	Geologist, British National Oil Corporation (UK)

1980	Geologist, Conoco (Norway)
1985	Chief Geologist and New Ventures Manager, Conoco (Norway and UK)
1994	Geologist and Exploration Manager, Statoil (UK)
2001	Vice President Exploration, Statoil (UK and USA)
2012	Advisor to Exploration Management, Statoil (UK)

My Proudest Accomplishments

When you’re the kind of person who’s always saying to himself “OK, but what have you done lately?” pride doesn’t last long. But one thing that sticks out is the fact that I have

managed to remain technical, despite a quarter of a century in exploration management. I never stopped thinking of myself as a geologist, thanks largely to certain unrelenting individuals who kept goading me into discussing new ideas and writing scientific papers. This meant that when I finally stepped off the ever-narrowing leadership pyramid in 2012, I was able to go back to my first love. Now I roam the world, looking at amazing geology. Not everybody gets to do their dream job, even for a while, so I'm going to savor it while it lasts!

And when people, unprompted, go out of their way to nominate you for awards, it's a big deal. So, I should also mention the honors that have come my way late in my career, from my country (Order of the British Empire, OBE, 2010), from the Geological Society (William Smith Medal for Applied Geology, 2015) and, not least, from the AAPG (Special Award, 2011). I used to say that I didn't believe in awards, but it's amazing how rapidly your perspective shifts when you actually get one....

My Biggest Disappointment

Despite a career dedicated to petroleum exploration, I'm a strong advocate of alternative energy sources. I expected such sources, from nuclear to renewables, to be taking the place of fossil fuels by now, but I was very wrong. I would passionately defend the role that fossil fuels have played in human advancement and quality of life over the past century or so. But as an oilman, I know my role must eventually be brought to an end, be it 30 or 100 years from now. We should strongly get behind the research that future generations will need.

Anecdotal Story

Petroleum systems people like to talk about the "critical moment" in the history of a prospect. In life, also, there are pivotal moments, triggering a chain of events that can affect individuals' careers and, indeed, the direction of entire companies. For me, one such moment happened back in 2002 when I was sitting in the London staff canteen with my then boss, Bill Maloney. Bill had just joined the company

as SVP of international exploration. At the end of a long, rambling chat about our favorite subject, music (Bill is an accomplished drummer, I play guitar, and we were eagerly looking forward to jamming), Bill suddenly dropped this bombshell into the conversation; "I want to take Statoil into the Gulf of Mexico." I almost fell off my chair. Why? Because only 2 years previously, the corporation had exited the same area after some poor results. There was no way we would get approval to do it. It would surely fall at the first hurdle. But the look in Bill's eyes told me he was serious, and as a geologist and would-be deal maker, I felt it made sense, too.

So began a long and arduous roadshow, meeting every power broker in the corporation and trying to convince them to do something totally counter to their intuition. Slowly, the pieces fell into place. At the same time, we did the regional homework—identifying the breaking plays in the GoM, which companies were strong in them, and which ones might need help drilling up their portfolio. Then, armed with maps and cheat sheets, we trudged around what seemed like every company in Houston, door-stepping them and explaining to a sometimes skeptical audience why they really needed us. Against all odds, we reentered GoM in 2004 and shortly afterward took part in our first discovery in Alaminos Canyon. Six years and numerous deals later, I was working in a large office in Houston! Not only were we in several major deep-water fields, but had a large acreage portfolio and had used our presence in GoM as a springboard for major onshore shale initiatives. It was a stressful time, with massive technical and commercial challenges, but it was also the most exhilarating time of my career.

My Advice to You

It's the easiest thing in the world to kill a geological idea, but it takes perseverance and imagination to nurture one. So, before you risk that play or prospect out of existence, first ask yourself the big questions; "What will it take to make this work?" and "How good can it be?"

Acknowledgments

It goes without saying that family is most important. I couldn't have made it as a geologist without my wife, Barbara. But when it comes to career matters, three friends stand out from a very good crowd. Erik Lundin, geologist extraordinaire, who wouldn't allow me to bury myself in management. Berit Tvedt, my

commercial advisor, who taught me most of what I know about negotiation, economics, and geopolitics. And my ex-boss and jamming buddy Bill Maloney (see "Anecdote" and his own bio in this collection)—the living proof that you can achieve at the highest levels in this industry while still putting people first.

John Robert Dribus



Career History

Born 1953, in glacial moraine country near Cleveland, Ohio

1974	BS in Geology, Kent State University, Kent, Ohio
1976	MS in Geology, Kent State University, Kent, Ohio
1976	Bendix Corporation and Mobil Nuclear Fuels Uranium Field Geologist
1981	Mobil Oil Exploration Division, New Orleans
1987	Mobil Oil Producing Division, New Orleans
1997	Mobil Oil Exploration Division Deep Water
2000	Holditch Reservoir Technologies
2002	Schlumberger Oil Field Services, Principal Geologist in Deepwater Petroleum Systems
2008	Schlumberger Technology Corporation, Global Director of Geoscience Curriculum
2010	Schlumberger Technology Corporation, Global Geology Advisor

My Proudest Accomplishment

It's a simple thing, but one of the duties I truly enjoy in my job is being a mentor and instructor to our next generation of petroleum professionals. One of the things I am proudest of is when I take new engineers out into the field to look at an outcrop or a quarry wall, and help them to see the reality of what they have been calculating, modeling, and predicting. Geologists have a lot more field exposure than their engineering counterparts, and it is very rewarding to see the light bulb turn on in their eyes when a young engineer "sees" how a shale-filled channel can compartmentalize a reservoir, or how a fault can actually bring two porous units together and permit migration and fluid flow, or how a sand injectite can connect two sands across an impermeable shale. I think one of the most important things we can do is to share with the next generation not only our technical knowledge, but also our excitement and our insights when we are in contact with the reservoir at the outcrop or road cut.

My Biggest Disappointment

In 2014 our industry began a very difficult and rather rapid journey down into the current deep valley of low prices. My biggest disappointment is that many of the new geologists and engineers I've helped to train and to get excited about this profession have been let go as operators and service companies struggle to survive in this terrible environment. At this point, we think we may know how deep this new valley in the cycle will be, but we really do not know how long it will stay below the level we need for viable wildcat exploration to return. I am hopeful

that when the price climbs higher to once again enable creative exploration, we will see some of these younger people emerge from the academic programs and other industries they have sought refuge in during these hard times. When we look at the declining production curves and the dwindling reserves of many countries, we know we must find new reserves to replace what is being consumed now. But, for now, we live in painful and disappointing times in the oil field.

Anecdotal Story

My story is about coming to the realization of how some very simple things can hold the most profound truths. One of my roles in my current job is to try to figure out why some very promising prospects turn out to be dry holes. It's important for service companies to provide technical solutions and new tools to help our clients better assess prospect risk, so we need to know what things do not work as well as what does. As I was looking at our new seismic data over some of the discoveries and dry holes in the margin-edge turbidite play along the eastern coast of Africa, I recognized that some of the basin floor fans had the same character in the shale above the reservoir as below it, and that these were usually dry holes with either no charge or only residual pay. But, the ones that had layered pelagic shales above and chaotic brittle shales below often had substantial oil and gas accumulations! I then realized that I was seeing that some shales were clearly better seals than others! And, if these good layered seals were right below the potential reservoir, the sands were usually not charged because the hydrocarbon was blocked from migrating into the reservoir. So, if I have brittle chaotic shales above AND below the sand, there was no seal to stop and trap the hydrocarbon. If I had layered pelagic on top and below, I had no migration pathway into the reservoir to allow it to charge. If you have the same shale above the reservoir interval as below, you stand a good chance of failure! Of course I found there were exceptions, but as a rule of thumb, this simple relationship appears to be holding up as more discoveries and dry holes are drilled.

My Advice to You

To my generation: please share your knowledge and your excitement with the next generation coming up behind us. Mentor, coach, advise them, take them out to the outcrop with you, whatever it takes to help them learn what you have learned so they can spend their time discovering new things. And, to that next generation: like any good reservoir, always be permeable and listen to the ideas that others have, especially those old ones. Learn how to separate observation from interpretation and do your observations first, gathering all the information and data you can, and then begin the exciting and creative part of deciphering what it could mean.

Acknowledgments

I want to thank my many mentors for helping me to grow over the years and teaching me how to observe first, then question, and then creatively interpret. But, I have special thanks for a few. Thank you Dan Tearpock, for teaching me to look at a map with keen eyes. Thank you Arnold Bouma and Roger Slatt, for the many times you spent in the field with me helping me to appreciate "rock scale" and detail. And thank you Pete Rose, for sharing your excitement about the industry and your inquisitive way of testing risk and uncertainty. I am forever indebted to all of you.

Bernard C. Duval



Career History

1952	École Polytechnique, France
1955	Grenoble University, degree in geology
1957	IFP School, Master Petroleum Geosciences
1958	Compagnie des Pétroles Total (Libye)
1964	New Projects, Compagnie Française des Pétroles
1966	IFP, seconded to CVP, Maracaibo, Venezuela
1968	Total, New Ventures
1971	Total Petroleum, North America
1976–1984	Minatome, Total Compagnie Minière
1977	Stanford Executive Program
1985–1995	Total SA, Paris
1995	International consultant, Assoc. Professor IFP School, Total Professeurs Associés

My Proudest Accomplishments

It was a privilege to be designated as Senior Vice President-Exploration of Total in 1985. During a 10-year tenure in this position I contributed to significantly upgrading the upstream portfolio of the company, and managed an exceptionally gifted and creative exploration team who deserves a large part of the credit. An advantage of the position was to have the responsibility not only for the technical part of the business but also for the New Ventures Department and negotiations relative to the acquisition of assets with potential reserves additions. This gave me and the team interplay with several decision-makers and my peers of the industry, partners, and government representatives and, therefore, facilitated the perception of a global strategic vision.

We successfully delineated the Villeperdue oil field of the Paris Basin (a stratigraphic accumulation discovered with our partner Triton), a “giant” by regional if not international standards! A discovery on License 3/14 of the UKCS was also intensively appraised despite some expressed doubts, thanks to Jean Gérard’s talent and convincing energy. It would become Dunbar, a giant field whose welcome production would replace the declining Alwyn field. We found Cusiana and Cupiagua with our partners BP and Triton in the foothills of the Colombian Eastern Cordillera, following a concept proposed by my colleague and friend Jean Ferrat in spite of 17 noncommercial wells drilled in the past on the same play (Jean had belonged to the same year as mine at the IFP School, like the other Jean, already mentioned). These two fields came out as giants with 1.5 Bbbl of cumulated reserves and a peak production of 500,000 BOPD.

After an intense synthetic study of the Mahakam delta petroleum geology, which revisited this part of the Kutei Basin of Indonesia well after the first giant oil discoveries (Bekapai, Handil), a new model combining stratigraphic and hydrodynamic components was established by our team of experts in Balikpapan and led to another gas giant discovery, Peciko, as well as a better understanding and subsequent reevaluation of the Tunu gas accumulations. This work was materialized in the construction of four more liquefaction trains at the Bontang plant and almost tripling the area’s production to 550,000 BOED. The group responsible for the study was composed of Ghislain Choppin de Janvry, their leader, Yves Grosjean, Jean-Luc Piazza, and Bernard Loiret—they were named “The 3 Musketeers” like the heroes of the famous novel by Alexandre Dumas who, like them, were four... This great accomplishment illustrates the need for managers to focus the project organization on the team’s “chemistry,” with the right mix of experienced and younger participants. I will not quote any more company names because the list would be unac-

ceptable within the confines of this contributing article. On a personal note, I had a special interest in that business, having negotiated with our partner Inpex of Japan the farm-in deal, which gave Total a 50% working interest and the operatorship of the permit in 1970.

We started a new operation in Yemen first in the Wadi Sarr Basin of the Hadramaout region, which led to several oil discoveries (recent exploration found significant reserves in the basement), and later in the Marib-Jawf Basin more to the west where much gas and some oil were found in an amazingly narrow elongated permit of 20 x 130 km² straddling the border between the two Yemenite states at the time. Many years after, this position led to Yemen LNG (in which Total is the largest shareholder) combining the abovementioned gas and more gas found previously in other parts of the basin.

Successful appraisal was conducted on the offshore Bongkot Field of Thailand, with 3D-driven extensions along structural trends well beyond the field limits.

An oil discovery was made in 1989 in the Apennines region of Italy, named Tempa Rossa, on a permit that had been granted in the early 1980s. The challenging structural complexity and the great depth of the objective have combined to delay production which should reach 50,000 BOPD.

Successful delineation of previous discoveries took place in the Austral Basin of Argentina, particularly the giant gas accumulation of Carina. In Venezuela, Total was able to access a block in the Jusepin area, offered for bidding in a round dedicated to reactivating former depleted fields. New oil in large quantities was found at depths of 5,600 m in the same reservoirs as those producing in the neighbouring giant El Furrial field. The field produced 37,000 BOED at the peak.

I can mention two more actions on the portfolio which set the stage for discoveries and production during my successors' tenures: a nonoperating share of deep water Block 14 of Angola, which carries several large fields, and a participating interest in a large block of

the Caspian Sea, that led to the discovery of the supergiant Kashagan Field of Kazakhstan. I remember having said at the time to the company's Executive Committee when making a case for this last deal that I could not think of any better prospect of such magnitude in any part of the world, now or in the future. I have not changed my mind since.

My Biggest Disappointment

After the Cusiana discovery attention was focused on the whole front of the Cordillera. We went to see the Colombian Ministry to request a block that was vacant, on trend north of Cupiagua. We were told that the block had already been acquired by one of our partners, who had acted faster. We approached our partner asking for a participating interest in the name of our positive collaboration on the discoveries, but the proposal was rejected. Actually, the area in question (Piedemonte) delivered only minor reserves compared to Cusiana and Cupiagua. It was mostly gas at extreme depths and in a much more complex structural context, not counting a new contract that had become less favorable to the industry, and I am not sure we lost out in the end. However, I felt miserable at the time to have to let such an opportunity pass. And, by the way, it teaches a lot about the ins and outs of "trendology" (it worked in Thailand!), as well as the need to react quickly in this business!

Anecdotal Story

The anecdote involves not only your friendly contributor but also a geologist friend. During my young years in Venezuela, when I was in charge of a study on the potential of western Venezuela, along with colleagues of the IFP, I had the opportunity to do some field work in the Sierra de Perija, not far from the border with Colombia. One of these trips consisted of visiting the Quebrada La Luna and doing some sampling there. This site is well known for having given its name to the famous major source rock of the Maracaibo Basin. When doing such work you spend most of your time walking down the river and looking at the banks because this is the only way to see some outcrops otherwise buried below a lot of jungle

vegetation. They are not the most pleasant conditions for field work, made worse by a lot of rain and companions such as snakes, spiders, and many other “friendly” species. However, the benefit was to observe the greatest rock you might dream of as a source, a spectacularly black, organic-rich, carbonaceous sediment with record TOCs.

But that was not all. One of our young Venezuelan colleagues was participating in the field party and unfortunately, one of his shoulders came in contact with a poisonous plant whose protrusions must have contained a very special strong venom, because soon after the contact the shoulder started to inflate considerably, and in a few moments attained the dramatic size of an extremely serious edema. My friend Michel Latreille from the IFP and I managed to take him quickly back to Machiques where a doctor could take care of him (he spent several weeks before recovering a normal volume of his upper body).

The field observation, combined with this painful, unexpected event, remained in my memory, and I must say that my modest contribution to the Cusiana deal was to think that if a great source rock, the Colombian stratigraphic equivalent of La Luna, had been buried at the right depth (and past temperature) with a large anticline amenable for a related charge, well...why not?

My Advice to You

- Be perseverant; never give up. The lead time of some above-mentioned deals bears witness to a much-needed perception of the “temps long” (French for the long term). But act quickly, the best dishes are not served twice.
- Think globally; don’t stick to the sometimes-tiny little piece of land you are looking for on your prospect. In this respect, it is important to maintain scientific contacts with known experts and university professors who will contribute to give you a larger perspective. Allow me to give a few more names with whom I had fruitful relationships, to support this view: Peter Vail, Emiliano Mutti, Martin Jackson,

Hubert and Annie Arnaud, my special advisor Carlos Cramez, and the late George Allen and Gérard Demaison.

- Read a lot and attend as many meetings as you can; ideal for expanding a valuable network of expertise and friends. In this respect the AAPG has been like a family for me; I was pleased to give quite a few contributing papers and got a lot in exchange. I have enjoyed a Distinguished Lecture Tour across the US and Canada and was proud of receiving a Distinguished Achievement Award and an Honorary Membership. Attending, for instance, the Discovery Thinking sessions, organized by our friend and now President-Elect Charles Sternbach, or the historical sessions initiated by Hans Krause, is like participating in several exploration real-life adventures with all their related lessons and benefits. In brief, keep learning all the time!
- Think stratigraphic. The time of large undrilled structural traps may not be quite finished, but long sequences of such plays are definitely over, except maybe in areas unattainable under current price conditions. A good understanding of sequence stratigraphy and seismic applications by all, including managers, is therefore needed. Act daringly on this type of play because the risks are much more difficult to identify and quantify properly.
- Speaking about risk analysis and management, which have been my main subject for teaching, think about a balanced portfolio, diversifying it in the level of risk, potential volumes, play types, contractual exposures, and conditions. A final, somewhat personal word: take your spouse to some of your best field trips. She, or he, will better understand your very special passion for this uniquely gratifying profession. I did that successfully with my wife Francine, my finest and most rewarding discovery!

Flávio J. Feijó



Career History

Born 1946, Porto Alegre, Brazil

1967	BS Geology, Universidade Federal do Rio Grande do Sul, Brazil
1992	MS Stratigraphy, Universidade Federal do Rio Grande do Sul
1968–1975	Wellsite geologist in six Brazilian basins, Petrobras
1969–1970	Field geologic mapping, Parana Basin, Petrobras
1976–1990	Basin analysis, prospect generation and sedimentary lab, Sergipe and Alagoas Basins, Petrobras
1991–1994	Stratigraphic analysis, Petrobras Headquarters, Petrobras
1995–2014	Teacher, mentor and lecturer, Petrobras University

My Proudest Accomplishment

Throughout all the second half of the past century, Petrobras was the only oil company allowed to explore, drill, and produce oil and gas in Brazil. That circumstance led to an enormous wealth of geologic data from all the nation's sedimentary basins. Starting in 1983, many geologists, geophysicists, and paleontologists gathered to normalize that knowledge in standard stratigraphic charts. Needless to say, so many top scientists had their own ideas about the job, and it stuck for some years. At last, in 1993 I was assigned the task of picking up all those 29 charts and making them printed. I spent more than 1 year consulting with 41 colleagues, and eventually the diagrams were published in 1994. Up to this

day that is a remarkable reference, much used both in industry and academia by all those who must deal with any of the Brazilian sedimentary basins.

My Biggest Disappointment

Prospect generation in Petrobras was and is performed by geologists and geophysicists ad hoc teams. Throughout the early 1980s, we worked hard in about 20 prospects for the Cretaceous in the Sergipe and Alagoas basins. Each one was eagerly mapped using everything we had on hand, from outcrops to well data to low-resolution 2D seismic profiles. Drilling operations were closely tracked, including visits to the rig location itself. To our dismay, most of those wells were dry holes, but at last two of them offered some hope. The first one was targeted for Aptian conglomerates, which are known oil and gas producers in several fields nearby. The big surprise came when some oil flowed from Campanian fine-grained fractured carbonates, which had never shown any oil before, 300 m above the main target. That odd discovery was widely celebrated, only to be established subcommercial 2 years later. The second wildcat found oil for the first time in Maastrichtian turbidites in Alagoas Basin, but later was also abandoned as a poor producer. I found out that I would better serve my employer by performing stratigraphic analyses and teaching than by trying to become an oil finder.

Anecdotal Story

In 1969–1970 I was the junior member of a crew led by the great geologist Waltir Guazzelli, intended to map about 13,000 km² of the Parana Basin in southern Santa Catarina State. The job should have been done in 2 years, and we used aerial photographs and field control to draw geologic maps on the scale of 1:50,000. Those were sedimentary and volcanic rocks, from Pennsylvanian to Early Cretaceous. A particular north-south small river valley in the central part of the area puzzled us. There were great outcrops of Early

Permian (Sakmarian) periglacial rain-out paraconglomerates and washout coarse clastics, overlain by fine-grained shallow marine sands with wavy bedding and tidal and deltaic front lobes. The problem was that those outcrops in each side of the steep valley simply did not match. Pressed by that tight schedule, we drew a fault along the valley and went forth. Twenty-five years later, we organized a field trip to practice sequence stratigraphy concepts using those very same outcrops. People were having a hard time trying to stack all those rocks in a logical pattern when the light suddenly came on. The out-

standing Petrobras geologists Wilson Winter, Almerio França, Cesar Cainelli, and Mario Carminatti showed the group that those huge and solid sandstone outcrops were displaced. They had slid on the soft glaciomarine muds and were somewhat deformed. It was a great shock to learn that one cannot trust even in outcrops.

My Advice to You

Never stop learning. I am retired now, but I am still lecturing and reading a lot, and I have just purchased two precious new geology books to keep things going.

Richard L. "Dick" Findley



Career History

Born 1951

1973	BS Geology, Texas A&M University
1975	MS Geology, Texas A&M University
1975	Exploration Geologist, Tenneco Oil Company, Denver, Colorado
1978	Exploration Geologist, Patrick Petroleum Company, Billings, Montana
1983	Petroleum Geologist, Prospector Oil, Inc., Billings, Montana

My Proudest Accomplishment

I have been credited with the discovery of the Elm Coulee Field, Montana. This field was the initial discovery of the modern Bakken oil play and has been listed among the some of the largest oil fields in North America. It has also served as an analogy for the Bakken play and other unconventional oil reservoirs

around the world. It is one thing to make the discovery, but it is entirely another to make it economic. That credit goes to Bobby Lyle and his team of scientists and engineers at Lyco, and the team of scientists and engineers of Halliburton. This team developed the technology to combine horizontal drilling with hydraulic fracture stimulation and apply it to the Bakken middle member in Elm Coulee Field as the first commercial application of this technology to an unconventional oil reservoir. This technology has since evolved over many years through the efforts of many individuals and companies, and has truly revolutionized the oil industry throughout the world. A true team effort. I have been honored through my story being told in many publications and received awards for my accomplishment. Receiving the AAPG Outstanding Explorer Award in 2006 is the highest recognition an exploration petroleum geologist could ever dream of, as well as being recognized as the recipient of the 2006 Michel T. Halbouty Geosciences Medal from Texas A&M University. To be invited to be a part of the Heritage of the Petroleum Geologist and to be associated with the other contributors has to be, for me, the most humbling honor of my career.

My Biggest Disappointment

I was fortunate to participate in an oil business with colleagues and partners that I

found to have the highest integrity and trustworthiness. The partners in Elm Coulee are a prime example of that. I have heard the stories of a few people who were perhaps questionable in that regard, but I always chose to rely on a look in the eye with the words “we’ve got a deal” and a handshake as better than any agreement could ever be. It has been a reliable way for me to do business. I am winding down my career with one last big deal and the core of that partnership is with Elm Coulee partners who think maybe we can do it again, and with new partners I am very confident have the upmost integrity and trustworthiness. On my way to this (maybe almost) last partnership, however, I encountered multiple individuals that turned out to have no integrity and are not trustworthy. Disappointment is a strong feeling and I chose not to do business with them but I also remain confident they are a very small segment of our industry. I am not going to conclude my career thinking that you cannot do business with a handshake and I will continue to do business that way but I will, however, take a little deeper look into their eyes.

Anecdotal Story

I have been lucky to love what I do as a profession. I always looked forward to doing my work and having an almost everyday opportunity to be excited about the possibility of maybe today will be the day when I make that big discovery. I remember my day in early 1996 and it was truly exciting. My partner, the late Bob Robinson, and I were drilling a vertical well for bypassed pay on a small structural closure in Richland County, Montana in the Williston Basin. We were not targeting the Bakken and we certainly were not looking for a giant oil field. You also have to remember at that time that the Bakken was a four-letter word in the Williston Basin (including in my own vocabulary). There had been a Bakken play in the late 1980s and early 1990s that targeted the Upper Bakken Shale, a world class source rock, with horizontal wellbores (pre-horizontal fracture stimulation) that was going to hold every acre in the basin by production. As it turned out, only a very few small sweet spots were commercial

and the Bakken was a bust. The kindest way to describe the Bakken was maybe a bailout zone to get part of your investment back if the deeper objectives were dry, but it certainly was not going to be a primary objective again.

While drilling our well we did drill through the Bakken and when we drilled the Upper Bakken Shale we had a very typical 100-unit gas increase on the mud log. Everybody knows there is oil in the shale. However, when we drilled into the dolomitic Middle Member we had a 10-ft drilling break and a 400-unit gas increase on the mud log. I am going to blame the late hour, as this occurred at 2:00 am, when most shows occur, but I only thought at the time, “This is interesting.” I attributed the drilling break and the indication of porosity as a localized occurrence related to the structural closure. I had no idea there was any porosity in the Bakken Middle Member and certainly not a regional occurrence. We drilled to our primary objective, had our expected shows and ran pipe to production test the deeper objective. While sleeping the rest of the night I must have been thinking about the show in the Middle Member of the Bakken when I suddenly woke up with a vivid “light bulb moment” that said the “oil is in the Middle Member!” It was this realization that really turned out to be the key to unlocking the Bakken potential and at least in my mind was that moment we found a giant oil field, although I did not realize at that time. Our deeper objective turned out noncommercial so we decided to complete the Bakken as a “bailout.” However, instead of perforating the shale where the conventional wisdom said where the oil is, we just perforated the Middle Member thinking this would give us the best completion. After a frac, we had a 157 BOPD initial potential compared to an average initial potential of vertical Bakken wells of 60 BOPD. A typical vertical well also exhibits a steep decline to stabilize at 10 BOPD; however, our well did not exhibit that typical steep decline. We chose correctly.

After watching the production for several months, Bob called me and said that this well is not declining like the other wells and asked me what turned out to be a very profound

question, “Do we have anywhere to develop this?” I told him that I did not think so because we were trapped by a small closure, but I would take a look. I started to look at the available control, concentrating on mapping the Bakken Middle Member, and was surprised to find that not only was the porosity in the Middle Member continuous over a 40-mile by 5-mile trend with distinct limits based on my porosity cutoff, but that the “dry holes” had the same log-calculated low salt water saturations as our well. I called Bob and told him that we had discovered a giant oil field. Bob, with his land background, was a bit skeptical but just took my word for it and agreed to buy some key leases on the bypassed dry holes within the porosity trend. After I documented the geology, I called Cameron Smith of Cosco in New York, a person I greatly respect, particularly his business and financial expertise, and told him we had discovered a giant oil field. He also was a bit skeptical but he realized it was apparent we needed an operator that could handle a large field and money we did not have to lease the acreage in the porosity trend. Cameron took my “discovery” on blind faith, as did Bob, and we met in Dallas to meet with Bobby Lyle of Lyco Energy with whom Cameron had developed a good relationship. I presented the “Sleeping Giant Project” as I had named it to Bob, Cameron, and Bobby, the first time anyone had seen the play. They all recognized the potential and Bobby had his scientists and engineers perform due diligence that night and agreed to meet the next morning for breakfast and he would let us know if he would take on the project. We had breakfast and Bobby said he had good news and bad news. The good news was his engineers felt I had understated the potential of the field and the bad news was the geologist could not stay that night because it was his anniversary and needed one more day to confirm the geology. He did take the play and agreed to buy acreage in the porosity trend and reenter 10 “dry holes” to confirm the concept. The reentries occurred over late 1997 and into 1998, during a period when we had another precipitous drop in oil price in our history, but we did confirm a large accumulation of oil. The key ques-

tion that remained to be answered was, how do we get it out economically?

To help answer that question, Bobby brought in Halliburton to study the potential of the Sleeping Giant Project and application of horizontal drilling with fracture stimulation to unlock the potential of the Bakken Middle Member. After exhaustive research on the Bakken in Sleeping Giant, we drilled our first horizontal well in February 2000 targeting the Bakken Middle Member, and after an initial flow period we fracture-stimulated the well and had a positive result of over 400 BOPD. It took a learning curve that resembled a roller-coaster ride of over 13 wells and millions of dollars to finally get consistent results. Elm Coulee is a significant field and it has been exciting to be part of the development of the field. The evolution of the horizontal fracture stimulation technology through Elm Coulee and beyond is a lasting legacy to Elm Coulee. I hope you have an equally exciting moment in your career and never give up on that possibility to experience it.

My Advice to You

The words of Wallace Pratt: “Oil is first found in the minds of explorers,” are profound, and I would add, “with an open mind.”

Brian Russel Frost



Career History

Born July 20, 1956, San Jose, California

1978	B S Geophysical Engineering, Colorado School of Mines
1978	Phillips Petroleum, Rocky Mountains, GOM, North Sea, Indonesia, China, East Africa
1990	Conoco, Deepwater West Africa, Nigeria, GOM, Trinidad, West of Shetlands
1998	British Borneo, Deepwater GOM, Brazil, Mauritania
2000	Anadarko Petroleum, Deepwater West Africa, Nigeria, Mozambique, Colombia

My Proudest Accomplishments

Identifying and capturing frontier deepwater plays in Mozambique and Colombia that resulted in play opening world-class discoveries in the Rovuma and Sinú Basins. Capturing 8 MM acres in the ultra-deepwater Magdalena fan and acquiring a 30,000 km² 3D program over the area. Estimated well spud in 2017–18.

My Biggest Disappointments

Finding out all grabens do not contain source rock and uncalibrated seismic data cannot distinguish between porous sands, oil, or gas.

Anecdotal Story

I got my first international assignment in Indonesia on a project in Irian Jaya. We were operator of a large offshore concession with production in an aerially extensive Miocene carbonate.

As the junior interpreter, I was assigned the eastern map sheets in Bintuni Bay. The

Kais limestone was easy to map in most of the concession because it was overlain by a soft shale, but in my area the data were very poor.

After I left Indonesia, ARCO discovered the Tangguh gas field in a Mesozoic anticline beneath the Kais Formation I was mapping. The field has 17 TCF of dry gas and recently the FID for a third LNG train has been submitted.

My company was aware of the Mesozoic play and had previously drilled several dry holes west of the area and given up. I now believe the poor seismic reflection data in my area were due to hydrocarbon leakage from the giant gas field, and the structures with dry holes were in a migration shadow of the giant accumulation.

Sometimes bad data are good geology, so don't curse your luck. Don't walk away from a good idea and call it sour grapes. I've found some big discoveries where companies did just that.

My Advice to You

- Petroleum is where you find it, not where you'd like it to be.
- Let the data tell you the story; don't force it to fit someone else's model.
- You can't expect to get everything right, but you always need to plan for success.
- A reputation takes a lifetime to build, but only a moment to lose.
- If you find something good, share it; that way the good spreads.

James M. Funk



Career History

Born 1949, in Akron, OH

1971	BA Geology, Wittenberg University
1973	MS Geology, University of Connecticut
1977	PhD Geology, University of Kansas
1976	Geologist, Shell Western E&P, Alaska and California
1983	District Exploration Manager, Shell Western E&P, Rockies and Michigan
1986	Division Exploration Manager, Shell Offshore
1987	General Manager Geology, Shell Oil Company; GM Exploration, Shell Offshore
1991	Vice President, Shell Offshore, Inc., Shelf
1998	President, Shell Continental Companies
2000–2003	Senior VP Equitable Resources (EQT) & President Equitable Production Co.
2004–2016	President, J.M. Funk & Associates, INC.
2000–2016	Director, Westport Resources (2000–04), Matador Resources Company (2004–08), Sonde Resources (2009–13), Superior Energy Services (2006–), and Range Resources Co. (2008–)

My Proudest Accomplishments

First, being directly involved in the early stages of Shell's deepwater exploration technology and drilling programs. In my various roles in the late 1980s and early 1990s, I was blessed to work with world-class technical

teams that drilled discovery wells at Mensa, Auger, Kepler, Mars, and Ursa to name a few. In addition, I recommended that Shell should form a "task force" to do a worldwide study of both ancient and modern turbidites, which clearly put Shell ahead of our competitors in capitalizing on deepwater opportunities. Over the last 25+ years Shell has found multiple billions of barrels of reserves in the deep water and it all started in the Gulf of Mexico in the late 80s and early 90s, based on early discoveries and technology.

Second, working as a consultant with Mike Forrest, we were asked to do a comprehensive review of Range Resources Corp. exploration potential in the Appalachian Basin. Over the course of a couple days we saw all the potential play opportunities that were being considered. Late on the second day, as I remember it, one of the last plays we looked at was a potential unconventional play in the Marcellus shale that was enthusiastically presented by Bill Zagorski, Range's regional geologist. I have to admit that I knew nothing about the Marcellus at that time, but I knew a bit about the Barnett and other developing shale plays, and the Marcellus looked very interesting based on Bill's description of gas shows, historical blowouts, etc. Based on this review, I recommended to Range's executive team that they should test the Marcellus potential, which they did....and the rest is history. Range discovered what may end up being the biggest gas field in the world.

My Biggest Disappointment

The lack of commercial success in any of the frontier basins in Alaska and California that I worked on during the early part of my career have to be both my biggest disappointments and the source of key learnings that continue to guide my exploration decisions today. In spite of having industry-leading data sets, management and research support, exceptional technical teams, a lot of overtime work, and successful lease bids, the drilling results were all negative. In retrospect, what a great

learning experience this was; the first principles related to charge systems, trap integrity, and reservoir quality are always critical for success and that risked economics are always suspect.

Anecdotal Story

After 40 years in the E&P business I have many stories, but my favorite, and probably most significant, is the drilling of the Auger discovery well. The Auger blocks had been bought in the 1984 and 1985 lease sales and was already on the drill schedule when I was transferred to Shell Offshore in 1986 as Division Exploration Manager. New to the Gulf of Mexico and knowing the importance of success in deep water for Shell, I was fascinated by my first technical review...a 100-MMBOE prospect in 2900 ft of water. The shallow objectives were good amplitudes, but had limited areas, and the deep one was potentially big though controversial...was it a sand or the top of salt?

As drilling proceeded through the shallow objectives, the results were discouraging; poor-quality sands with retrograde condensate and faults. As we drilled deeper we found additional hydrocarbon-charged sands. So at the time, I concluded that we were drilling a good-quality trap on the flank of a salt-related structure and that clearly we should keep drilling to test the deep Pink event. However, as things go in the patch, some folks in upper management thought that it was time to quit and move on to the next prospect. Their logic was that we'd been on this well for a long time without clear success, we'd spent a lot of money, and drilling ahead was challenging.

Now for the rest of the story, with the help of a first-class operations team and the support of a few drillers, we were able to drill ahead, and in September 1987 we hit the Pink event (S-sand) and found about 200 ft of oil at a depth of 19,000 ft. This was the field-maker reservoir, and Shell sanctioned the development of Auger in December 1989. The early success at Auger bridged the gap between exploring in deep water and developing fields there. To date, the Auger platform has produced approximately 300 MMBOE.

My Advice to You

Understand that we work in a cyclical business; build skills and networks to capitalize on future opportunities for yourself and your company.

Acknowledgments

I have been blessed and helped throughout my career and I have many to thank for their advice and counsel along the way. First, I want to thank the love of my life, Sherree, for all her support during my many, many nights away, and for always being eager to stop and look at an outcrop to ponder what it means. Second, I want to thank my early bosses and mentors at Shell, Marlan Downey, Mike Forrest, Tom Tourek, Joe Gittleman, Dave Haglund, and Tom Hart. Last, I am thankful for knowing John Bookout, Charlie Blackburn, Jack Threet, Rich Pattarozzi, Dick Nickolas, Mike Baranovic, Wes Lilley, Dave Johnson, Ken Butler, Bill Dirks, Scott Cameron, Dave Lawrence, and the many, many, great geoscientists whom I have worked with during my career.

Julie Garvin



Career History

Born 1960, in Ft. Smith, Arkansas

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|------|--|
| 1983 | BS (Honors) Geophysics from University of Texas at Austin; during college was Secretary of AAPG Student Chapter and received Texas Oil and Gas Leadership Award |
| 1983 | Marathon Oil Company; Began career as an exploration geophysicist developing prospects for Gulf of Mexico lease sales, Argentina Bid Rounds and Onshore Gulf Coast. Exploration Manager for Gulf of Mexico Deepwater, Geoscience Advisor for Worldwide Exploration |
| 2005 | President, Roxanna Oil Company |

My Proudest Accomplishments

My involvement with the Marathon Oil exploration teams that consistently delivered major discoveries in the deepwater Gulf of Mexico, including Troika, Petronius, Lobster/Hercules and Stones. I had the honor of being involved in the projects from the inception of the concept, through the initial test wells, and later in the appraisal program with Texaco, Shell, and BP. I was one of a handful of female geoscientists in the early 80s and 90s who were on seismic vessels, land rigs, and deepwater drilling rigs, and one of the first women in Marathon to achieve a management level position in exploration.

After the birth of my two children, Matthew and Grace, I made a personal decision to leave Marathon. This led to the pinnacle of my accomplishments, running our family oil company founded by my father, Marlan Downey. Over a 10-year period, we successfully grew the company to over 500,000 acres of working and royalty interests, creating a reputation in the industry for technical excellence and integrity, and a proven track record of exploration success.

My Biggest Disappointment

My biggest disappointments have been about projects that we generated, but never were developed. In most cases, it was a matter of timing, and has taught me an important lesson about the value of rapid execution. In exploration, we are working under the ticking clock of primary term leases, usually having only 3 years to test your concept and determine commerciality. Sometimes, in the interest of science, too much time is spent gathering and analyzing data that doesn't replace the value of information gleaned from a flowing well.

Anecdotal Story

A great exploration project is simple and elegant, and you'll know it when you see it. We had the idea of a Woodford shale oil play on the Anadarko shelf, in spite of industry dogma that it would be thin and immature. We ran our own samples through geochemical analysis, created isopach maps of the intervals, and numerous dip and strike cross sections. This work showed the Woodford to be in the peak oil window, and for the first time, explained why the Mississippi Lime above was oil saturated in fine pore throats and fractures, and had low water cuts due to the proximal charge. Our depositional model clearly laid out the basis for a Woodford thick on the shelf, due to the pinchout of the Hunton. In a 25-page PowerPoint presentation, we were able to tell the entire story, in a way that left little doubt about the quality of the play. Today this is known as the Stack

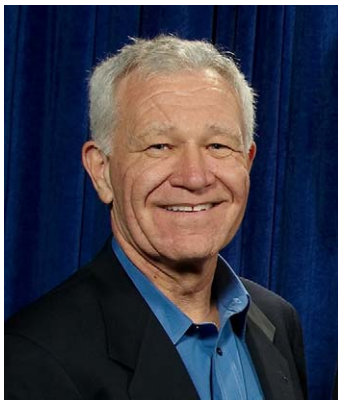
Play, and we are fortunate to have been one of the first companies in.

My Advice to You

Do your homework, and look at all the data, lots of data. Then question the data. Ask yourself, “Why was this a dry hole?” or “Why didn’t they complete the well in spite of oil shows?”

Be curious and follow your nose. Then be creative. Exploration is an inexact science, so there is a lot of room for interpretation if your technical evaluation is sound. Once you’ve landed on a well-thought-out concept, be passionate about your play. No one wants to invest money in a prospect that the originator wouldn’t invest their own money.

Paul (Mitch) Harris



Career History

1971	BS Geology, West Virginia University
1973	MS Geology, West Virginia University
1977	PhD Marine Geology and Geophysics, University of Miami
1977	Getty Oil, Houston, TX
1978	Gulf Oil, Houston, TX
1985	Chevron, La Habra, CA; San Ramon, CA; Houston, TX
2014	Visiting Scientist at University of Miami CSL—Center for Carbonate Research and Visiting Professor at Rice University Department of Earth Science

My Proudest Accomplishments

I retired from Chevron with more than 37 years of industry experience as a widely recognized specialist in stratigraphic, depositional, facies-related, and diagenetic problems that pertain to carbonate reservoirs and exploration plays in most carbonate basins worldwide. I very much appreciate the recognition that I received along the way from my universities, employer, and favorite societies:

- West Virginia University: 1995 Distinguished Alumni Professional Achievement Award and 2012 Alumni Recognition Award
- University of Miami: 2008 Iron Arrow Honor Society
- Chevron: 2001 Chevron Fellows Program (Technical advisor and mentor)
- AAPG: 1987–1988 Distinguished Lecturer, 2000–2001 International Distinguished Lecturer, 1988 Pratt Memorial Award, 2004 and 2006 Dott Memorial Award, 2009 Shelton Search and Discovery Award, 2012 Honorary Membership, and 2015 Powers Memorial Award
- SEPM: 2002 Honorary Membership, 2010–2011 President, 2011 Honorary Life Award from the Permian Basin Section, and Special AAPG/SEPM Oral and Poster Session “A Celebration of the Career of Paul “Mitch” Harris” at the 2015 ACE.

My Biggest Disappointment

Retiring from an industry career that was not just my job, but also my hobby and passion.

Anecdotal Story

Keeping an open mind, grabbing that opportunity when it’s there, never losing the desire to learn, and thinking broadly about what you are learning—I did and it changed my life forever!

My MS degree was in siliciclastic deposits, but after a field trip to the Florida Keys, I headed to the University of Miami in 1973 with a mind wide open to learn more about carbonates and an idea to do further research in Florida Bay.

While on a field trip to the Bahamas in 1974, I sat alongside my dissertation advisor Robert Ginsburg on a beach of the Joulter Cays in the Bahamas, gazing at the beautiful white sands. In that moment, when Ginsburg said, “Florida Bay has been looked at already. Look at this place; it’s beautiful! Nobody has ever worked here, and it’s a reservoir in the making!” I grabbed this opportunity and made the most of it.

The University of Miami–CSL was an ideal laboratory, not just for studying carbonates, but for understanding the industry interests and viewpoints and for building industry relationships. There were endless opportunities to meet with industry visitors, and take short courses and field trips with them. All of this allowed me to develop my own “industry view” while I was still a student and it definitely influenced me in my own research direction and findings from that point forward. What I learned at the CSL resonated throughout my career and provided themes that I carried through further industry research focused on carbonate reservoirs and exploration plays.

My Advice to You

Be active in the societies—I joined AAPG and SEPM in 1974 while I was a PhD student. I was attracted to both societies by the annual meetings and conferences, journals, and other publications, and especially the quality of their membership—seeing all of these as the perfect opportunity for potential scientific interaction and personal growth. I now realize that it was the interaction with other society members that provided me with the most enjoyment and personal growth.

I hope you find the same attractions to AAPG and SEPM that I did; it will be worth your effort to stay involved with and be active in these great societies over the span of your career. Three important things to consider:

- **Work/life balance**—We all have a career—a full-time job, which does indeed take full time to be good at it. Contributing to AAPG, SEPM, and other societies is time generally above and beyond that, so there are inevitable work/life balance issues to

be addressed. I want to stress that this is a genuine issue, greater for some, and harder to navigate through for many—you will be using personal time and taking extra business trips as you get more active in the societies. So find ways to address your work/life balance situation as your career progresses!

- **Your employer**—I could not have had a better employer than Chevron. I liked their technical focus, exciting and challenging projects, and people—and obviously for me, their unending support of my outside activities. You spend personal time on society contributions, but let’s be honest, a good deal of this effort infringes on your work time—it is inevitable! If your company doesn’t genuinely support your participation in these outside activities, your efforts will be extra challenging if not impossible. Find a way to present the value proposition to your company for what you want to participate in, there is one, and hopefully you can convince them that it is important for them to have you actively involved.
- **Your colleagues**—My passion over my career was to organize and actively participate in publications, core workshops, short courses, conferences, and field trips that created opportunities for earth scientists from industry and academia to focus on varied aspects of carbonates. Very few of these career activities were individual efforts! I cannot thank enough the long list of coworkers and colleagues who I was privileged to interact with and learn from as we worked on preparing talks, posters, and papers for various meetings and publications. Find people to interact with, those you like and will have fun with, those you think you will learn from, those who will get you to think and do things differently! A fruitful collaboration will make it worthwhile.

I can only hope that you find an employer as supportive as mine was, and colleagues as interesting as mine were, to make your career as fun and satisfying as mine was.

John R. Hogg



Career History

Born 1958, in Hamilton, Ontario Canada

1981	BS Geology McMaster University Hamilton, Ontario Canada
1981	Exploration Geologist–Arctic Canada, Gulf Canada Resources, Calgary, Alberta
1984	Exploration Geologist–Offshore Atlantic Canada, Husky Oil Operations Calgary, Alberta
1988	Petro-Canada Inc., Calgary, Alberta; Exploration Geologist– Offshore Atlantic Canada, Development Geologist Doe Creek “T” Pool Geological Specialist– Offshore Atlantic Canada
1997	PanCanadian Energy/EnCana, Calgary, Alberta; Team Lead/ Exploration Manager–Atlantic Canada, PanCanadian Energy/ EnCana; Vice President, Exploration–Atlantic Canada & Greenland, PanCanadian Energy/ EnCana
2005	Burlington Resources/ ConocoPhillips Canada Calgary, Alberta; Exploration Manager, New Ventures Western Canada; Exploration Manager, Arctic and Atlantic Canada
2007	MGM Energy Corp. Calgary, Alberta; Vice President, Exploration and Operations– Canadian Arctic; Corporate Officer
2014	President and Owner, Skybattle Resources Ltd. Calgary, Alberta
2015–2016	99th President of the American Association of Petroleum Geologists (AAPG)

My Proudest Accomplishments

- Discovering the Deep Panuke gas field, offshore Nova Scotia Canada; the first Jurassic carbonate reef field on the western Atlantic margin.
- Pushing an organization to drill a prospect below a producing field when every other Jurassic carbonate play on the Canadian margin had been a dry hole.
- Leading and mentoring young and mid-career geoscientists and building great exploration teams who were never afraid to fail.
- Being the 99th President of AAPG.

My Biggest Disappointment

I have been directly involved in drilling many offshore wells in Atlantic Canada. To me, drilling a successful wildcat is not as memorable as drilling a dry hole; they stay with you forever.

I was involved in the early 2000s in exploring in the Flemish Pass Basin, offshore Newfoundland with a group of companies. The original program was designed to test three distinct play types; we drilled one well, which encountered a noncommercial oil reservoir, and then one of the three partners gave up on the program. The two other partners could not muster the capital to continue, the lands reverted to crown and a decade later the prospects that we would have drilled were drilled by a competitor and were successful.

When I relive those events I still feel the frustration and pain of not completing the original program.

Anecdotal Story

I was fortunate in my career to work on many projects that were truly high-risk ventures. My career started in the Sverdrup Basin, in the high Arctic of Canada, north of 74°. In my third year of working that basin, 1984, I had worked up an offshore prospect that was selected by the consortium to be drilled; Panarctic et al. Buckingham O-68, west of Cameron Island. To me, the prospect was a slam-

dunk stratigraphic trap play, visible on seismic, and confirmed by well control; a no-brainer.

Well, it was a bust, a dry hole because the unconformity surface that I picked was truncated by a younger unconformity and the Jurassic sands were missing. I was devastated and humbled very early in my career; this turned out to be a good thing.

The Buckingham well taught me a great lesson for my exploration career: no prospect is ever a slam dunk; as grand as your idea is, as much technical assessment as you have done; what can go wrong, will go wrong, so take all criticism as constructive, be ready to turn 180° with new information or ideas and learn from your past mistakes.

My Advice to You

As professionals, part of your career should be to give back to others. Volunteer at your local, section, regional, or national level within your geoscience community; it will help your career and your network.

As a lifelong explorer, one key piece of advice that I give to young explorers is: don't just ask why a basin or a play is the way it is; ask the question "What if?" What if the reservoir was thicker, what if the bounding fault seals the entire structure, what if there is deeper prospectivity than the current TD?

"What if?" provides the ability to think outside the box, moves you away from the current state of the prospect to rethinking and challenging the paradigms build by others, and will make you a better explorer.

Dan A. Hughes



Career History

Born 1929, in Monroe, Louisiana

1951	BS in Geology from Texas A&M College, College Station, Texas
1951	U.S. Army, Artillery Officer, Korea
1953	Union Producing Company, New Orleans, Louisiana
1954	Union Producing Company, Beeville, Texas
1961	Consulting Geologist, Beeville, Texas
1964	Hughes & Hughes Partnership, Beeville, Texas
1980	Dan A. Hughes Company, LP, Beeville, Texas

My Proudest Accomplishment

My proudest accomplishment is founding and operating an international oil and gas com-

pany with success around the world, from a small South Texas ranch town, and staying there.

My Biggest Disappointment

Having had many minor disappointments in my career, it is hard to pick the biggest one to single out. However, in recent years, I worked an area in the shallow Upper Cretaceous in South Texas in an area that had some very profitable fields producing from small graben fracture-type structures. Using 3D seismic, I was able to find an area that had many of these prospects. After leasing a couple of these, a well was drilled that came in flowing 120 BOPD at 1,900 ft. I immediately began leasing all the other prospects on the map. The next eight of these that were drilled were all dry holes or noncommercial.

Anecdotal Story

In the mid-1990s, the oil business was in the doldrums again and it was decided that our company should again look outside of the United States for exploration. Our past record in Canada and Australia had been very profitable.

We gathered a group of investors and began visiting various South American countries. After a couple of years of analyzing geological basins and the political situations, we decided that Colombia would be the best country to explore. A company was formed and named Hupecol (Hughes Petroleum Colombia). One shallow prospect was drilled that produced but was too small to sustain a foreign operation.

A concession, called Cara-Cara, was found in the Llanos Basin that was owned by a small Colombian group that appeared to have a lot of merit. The Colombian group had drilled three wells that we calculated to be productive, but this nonoil Colombian company had junked the wells in an attempt to complete them. The concession required another well to be drilled in the near future to maintain its terms.

We made a deal to put up \$2,000,000 to drill this well to earn 50% interest in the concession. To make a long story short, the

Colombian group disappeared with the \$2,000,000, the concession expired and reverted to Ecopetrol (the Colombian National Oil company), and efforts to recover the money proved futile.

Most of our investors in the South American project dropped out of the venture at this point. Hupecol was reorganized and exploration continued. A few months later, to our great surprise, a Colombian government agency awarded Hupecol the Cara-Cara concession on much better terms than those of the old contract. After drilling a series of 5,000-ft wells, the production on the Cara-Cara concession reached 26,000 BOPD.

My Advice to You

The oil business is a series of “boom and bust” cycles, depending on the price of oil and gas. During the boom cycle, pay off your banks and get out of debt, as the bust is sure to follow. You will be ready for the next boom, whereas many of your friends will go bankrupt.

W. Herbert Hunt



Career History

Born 1929

- 1934–74 Schooled in oil business by father, H. L. Hunt
- 1951 BS Geology, Washington and Lee University
- 1951 Independent associated with numerous Hunt entities in the upstream, midstream, and downstream

Present Petro-Hunt, LLC, Advisor to Management; AAPG, serve on Corporate Advisory Board

My Proudest Accomplishments

Resulting from a college course assignment, I developed and drilled my first discovery, which lead to the small West Oretta Field, Beauregard Parish, Louisiana. I quickly learned that discovering oil and gas is a team effort. Fortunately, I have been involved in the discovery and development of numerous giant fields such as the Salt Creek Field, Kent Co., west Texas (1950); Dixon Bay Field, Plaquemines Parish, LA (1955); Fairway Field, east Texas (1960); along with British Petroleum the super-giant multibillion barrel Sarir Field in Libya (1961); and Black Lake Field, Natchitoches Parish, Louisiana, (1964). Other fields with working-interest ownership include the Nesson anticline fields of North Dakota and Prudhoe Bay on the North Slope of Alaska.

My Biggest Disappointment

Having Sarir Field—the largest field on the African continent—expropriated by Muammar Gaddafi.

Anecdotal Story

During the late 1950s through the 1970s, the Hunt interests were involved in an international search that resulted in discoveries in Pakistan, where there was no market, since developed by others; offshore South Africa again with no market, since developed by others; gas off the South Island of New Zealand in more than 2,000 ft of water, still undeveloped; and along with Dome Petroleum, the Kopanoar Field, Beaufort Sea of Canada, which still remains undeveloped. These all confirm that when discovering crude oil and natural gas, it certainly helps to have a market at prices and regulations that make it possible to bring into production.

During the 1990s there was an industry trend to consolidation by disposing of marginal and outlying areas with a movement to overseas endeavors. Hunt interests acquired

Little Knife and Charlson Fields in North Dakota because they fit with other Hunt operations and offered the opportunity to consolidate operations and recover additional oil. Since industry recovers a small percentage of the oil in place, it offered the opportunity for possible additional secondary recovery. Fortunately, in the late 2000s, new technology applications have enabled the industry to actually recover and produce from the shale source beds. Therefore, while the industry will never recover all the hydrocarbons, horizontal drilling technology and fracking has created new life for many areas.

My Advice to You

The discovery and production of oil and natural gas is an exciting business. For the best chance of success, I would encourage all of you to be part of a team that represents all technical and operational aspects of the industry. This will provide the best chance to capitalize on our ever-developing and changing industry technologies.

Andrew Hurst



Career History

Born 1953, Stoke-on-Trent (UK)

1972–1973	Technical Assistant, Field Studies Council
1977	BS Geology and Mineralogy, University Aberdeen (UK)
1977–1980	PhD Sedimentology Research Laboratory, University of Reading (UK)

1979	Post-doctoral Research Fellow, University of Bergen, Norway
1981–1990	Sedimentologist, Statoil, Norway
1990–1992	Regional Exploration Geologist, West of Shetland, Unocal, (UK)
1992	Professor of Production Geoscience, University Aberdeen (UK)
2015–2016	Blaustein Professor, Stanford University

My Proudest Accomplishment

My perception is that science is a journey and not a destination (with apologies to the Buddha!) and because of that I suspect that by default my proudest moments will always be in the future. It seems better to me to have pride in the way one does something rather than focusing on the product. I believe strongly that every cloud has a silver lining.

My accomplishments have undoubtedly benefited from the quality of my excellent collaborators. Many events in my professional

life have given me pride—scientific and professional awards, producing new exploration concepts, some of which lead to discoveries, developing and adapting technology, finding “fit for purpose” solutions, peer recognition, representation on scientific and professional panels, and building successful research groups. But where I derive the most pleasure is from interaction with peers where I use my skills and experience to tackle scientific and applied problems. It is always a good feeling to feel that my efforts helped. In scientific endeavour I particularly enjoy the challenge of being near the bottom of my learning curve and some might comment that is not difficult! With students I experience a similar buzz as they engage with my courses and demonstrate understanding and appreciate the relevance of my teaching to their goals. Am I proud of this? Well, it is my job, for which I am paid; I love it and am very grateful for that.

In academia and in the oil industry it is always relevant to ask “why,” to challenge paradigms and to identify dogma. Since joining academia I dedicated time to schemes that develop the “local geoscience content” in developing economies, a list that includes Brunei, Ghana, Tanzania, Cyprus, and Botswana. It is so easy to make a difference by spending time and sharing knowledge in these countries with their academic communities, professionals, and government ministries and, hugely rewarding on a personal level.

My Biggest Disappointment

I have a single disappointment, which was during the period when I was engaged as an expert witness for the prosecution in the Deepwater Horizon trial. This reminds me that sound geological understanding should always underpin any subsurface activity undertaken in this industry and that an understanding of the uncertainties the subsurface can throw at you is fundamental.

My “silver linings” from that experience will not expunge the tragedy from my memory. However, I am a realist and I believe strongly that we are all bound to make mistakes and that we should learn from them. By effectively constraining and communicating

geological risk to our colleagues, we serve our society in a noble manner.

Anecdotal Story

I started my career as a petroleum geologist during the major period of growth in North Sea exploitation, a defining time for the role of geology in exploration and field development. My journey began as a clastic sedimentologist with Statoil where I was given the freedom and encouragement to acquire, develop and apply science and technology to subsurface characterisation. I shared responsibility for appraisal and reserve estimation on Sleipner Vest, Sleipner Øst, Oseberg and Snorre fields, collectively >4.4 Bbbl of oil/oil equivalent; then venturing to work on Statoil’s first Arctic discoveries, Askeladden and Snøhvit (>1.35 bbl of oil equivalent). Concurrently I was able to specialise in geological applications of wireline logs, develop nondestructive methods for analysis of porous media, codevelop and apply mineral-chemical stratigraphy of sandstone reservoirs, and design of some of the earliest 3D geostatistical reservoir modelling software. Subsequently, with Unocal UK I worked in a regional exploration team that discovered >100 MMbbl reserves by opening new plays west of Shetland.

In my academic career I maintained a close association with the petroleum industry, both through student education and research supervision in petroleum geoscience and by research collaboration and research consultancy. An example of successful collaboration with industry involved the Alba field (UK) where we identified large sandstone intrusions, the mapping of which led to a redesign of field development and the start of my research on natural sand fluidisation and sand injectites. In 2001 my research group mapped sandstone intrusions that led to the first deliberate exploration of a giant sand injection complex and discovery of Volund field (Norway, >135 MMbbl). In the same period (1994–2000), I became Founding Chief Editor of *Petroleum Geoscience*, a new journal designed to provide rapid peer review and publication of material that is immediately relevant to petroleum geoscientists. Because

an idea shared often becomes a better idea, I have convened and coconvened more than 20 international conferences and published approaching 200 peer-reviewed papers, including several books. Currently I am working on the AAPG digital publication *Outcrops that change the way we practice petroleum geology*. Communication is so important.

Throughout my career I have tended to embrace the challenging areas that lie on the periphery of geology—clay mineralogy, probe permeametry, mineral-chemical stratigraphy and, more recently, sand injectites. I have referred to myself as being on the “lunatic fringe of geology” which, unfortunately, does none of my collaborators any justice! Of course, it is a joy to tackle problems a little beyond my reach, to step out of my comfort zone, and to have a steep learning curve ahead of me. These are the words of a very happy professional who thinks that he has the best job in the world. So when my daughter, at the age of 17, told me that she had decided to study geology, she shared with me that she was doing so “because she could see how much I got out of my life and she wanted some of that.” To say that I was overwhelmed is a huge understatement and perhaps it was no surprise when later my son followed suit.

My Advice to You

My advice to you is to never give advice! One reason for that is that we have different personalities, backgrounds, and motivations. However, I encourage you to follow your heart and let your head mediate. Avoid taking easy options and put yourself in challenging situations. Seek to work with the best and most successful professionals as nearly always they want to work with you, and be prepared to work hard, very hard. It is better to give it your all and fail than to hide behind phrases like “I knew I couldn’t do that anyway.” We geologists are blessed by the wonder and diversity of our science and we should seek to share that with others and bolster the importance of geology in society. I believe that it is important to retain intellectual and practical agility so that we are well prepared to react to change.

Acknowledgments

Acknowledgments could go on for ever because I enjoy huge support from hundreds of academic and professional colleagues spanning from my student days until now with my own students and post-doctoral research fellows. My BS mentor Nigel Trewin told me that doing a PhD would be the best years of my life; Nigel was correct except every year thereafter got even better! During my PhD, Andrew Parker and the late Bruce Sellwood steered me patiently while encouraging me to “spread my academic wings,” an experience that introduced me to Knut Bjørlykke who instilled in me the importance of pursuing fundamental science. Then I have my trio of AAPG Powers Medal winners, all true legends in their lifetimes and my close friends. In my professional life Marlan Downey, Ken Glenzie, and Koen Weber have been hugely influential and inspirational friends. I am grateful to all colleagues past and present; thank you.

Howard D. Johnson



Career History

Born 1950

1971	BS Geology, University of Liverpool
1975	PhD Clastic Sedimentology, University of Oxford
1975–77	Research Fellowships (Universities of Leiden and East Anglia)
1978	Shell, Koninklijke Shell Exploration & Production Laboratory, Shell Expro UK; Sarawak Shell Berhad, Sabah Shell Petroleum Co. Ltd.
1993	Shell Chair of Petroleum Geology at Imperial College London

My Proudest Accomplishment

To work and study in several world-class institutions, learning from some of the best and most dedicated professionals in the world and then having the privilege to educate some of their successors. This allowed me to work with, and to learn from, some towering and inspirational geologists, especially Harold Reading (Oxford University, formerly with Shell), Koen Weber (Shell) and Bob Sneider (Shell/RM Sneider Exploration). I am immensely proud of the strong influence that Shell has exerted in all aspects of my career—both the industrial and academic parts.

My Biggest Disappointment

This is more sadness than disappointment, but seeing the decline in the North Sea and realizing that I had worked there during a golden era of unprecedented E&P activity, which will never be repeated. At the peak of activity, Shell UK was operating around a

dozen rigs for several years, devoted exclusively to exploration and appraisal drilling—it all seemed quite normal and even unremarkable!

Anecdotal Story

I was initially shocked and stimulated, in equal measure, when at my final Shell interview I was told that the company needed sedimentologists to train as production geologists. Then, a few years after joining the research center (KSEPL), the company acquired one of the few Cray supercomputers in the world. This resulted in the chance to build one of Shell's first fully 3D numerical reservoir simulation models, specifically to consider alternative recovery processes in a complex fluvial reservoir (Statfjord Formation in the Brent Field). I quickly learned of the importance of close integration with reservoir engineers—and why it was helpful to know about reservoir sedimentology!

My Advice to You

I have spent the second half of my career educating young graduates and trying to inspire them in a similar way that I was inspired by the likes of Reading, Weber, and Sneider. They taught me that there is no substitute for technical excellence, life-long learning and a burning desire to educate others. In this way, young graduates will continue to successfully serve the profession, the industry, and the global community.

Michael S. Johnson



Career History

Born 1926

1947	BS degree Geology, The Ohio State University
1949	MS degree Geology, The Ohio State University
1949	Amerada Petroleum Corporation
1950	U.S. Army
1952	Amerada Petroleum Corporation
1958	Apache Oil Corporation
1963	Independent geologist

My Proudest Accomplishment

In 2006, I helped discover Parshall oil field (Bakken reservoir) in North Dakota, one of the largest oil fields in North America. The idea was based on meager geologic data and the potential of then-new horizontal drilling technology-to lease about 44,000 acres in Mountrail County, mostly for \$1 to \$10 per acre. At the time, none of the acreage in this area was under lease and no Bakken wells had been drilled for more than 12 years. The oil trap that my research suggested was unlike any oil trap in the entire Rocky Mountain region, at the contact between the mature and immature Bakken shales, the source beds (TOC average 12%). The recently discovered Elm Coulee field (a stratigraphic-type, Bakken trap located 110 mi westward in Montana), was the only Bakken, horizontally drilled oil field in the Williston Basin; it was our analog. Our acreage block, owned by a private investor, Henry Gordon and me, was subleased to EOG Resources, who drilled the discovery well. All the acreage was developed and was commercially productive, even

though the major reservoir objective was absent, the source rocks that form the trap were (and are still) considered to border on being immature, and the resistivity of the new pay zone was less than 100 ohm, compared to over 1000 ohm at Elm Coulee. The North Dakota Industrial Commission estimates that it will require more than 55,000 wells to fully develop this Bakken oil accumulation, which covers approximately 6 million acres. It fits the concept of a huge unconventional resource play. My estimate of producible oil reserves for Parshall Field is 15 Bbbl. Research indicates that there are fewer than 20 oil fields in the world with oil reserves exceeding those of the Parshall.

My Biggest Disappointment

My 5-year tour with Apache Oil Corporation was my biggest career disappointment. It was one of the first drilling funds created in the U.S. in the early 1950s. With federal tax rates at 80 to 90%, wealthy investors participated with 10- to 20-cent after-tax dollars in Apache's yearly drilling programs. Apache was led by Raymond Plank, one of the smartest oilmen I have ever known. For investors who would otherwise be burdened with operating expenses and income streams lasting 10 to 20 years, Plank created a tax-free exchange of Apache program working interests for Apache stock, with exchange rates approved by banks and engineering firms. It allowed investors to defer income tax until they sold their Apache stock at long-term capital gain rates.

Apache's yearly drilling programs required yearly success, which in the Rockies was hard to attain. In 1963 that challenge led to Apache's closing their Denver office and putting me on a small retainer. Two years later, Apache would discover Recluse Field, one of the largest oil fields in the Powder River Basin, setting the stage for Apache to become one of the most successful and most highly regarded oil companies on the New York Stock Exchange. My regret and disappointment is that I did not compensate them

for all that I had learned about the oil business during my 5-year tenure. My Apache years were not my finest hour.

Anecdotal Story

In 1967, thanks to a referral from Apache, I got a part-time retainer with Wessely Energy Corporation in Dallas and The Headington Oil Company in Oklahoma City. Wessely was headed by Arthur Wessely, who had achieved some initial success in the mid-continent and was backed financially by Buddy Fogelson, owner of a huge New Mexico Ranch and the husband of movie actress Greer Garson. Headington was owned by brothers Clare and Ed, two very fine oil people. Clare's son Tim would later become president of their company, overseeing the development of Montana's Elm Coulee Field, which sold for over \$1 billion.

They were interested in participating in Rocky Mountain drilling prospects. The first two prospects that I recommended to them were located in the Powder River Basin. I named them Clabaugh and South Bishop Ranch, both Minnelusa reservoir objectives. They were unconformity-type traps at depths of 9600 to 10,300 ft. After I acquired leases on 2000 acres at Clabaugh, it proved to be a dry hole. I deeply regretted disappointing Wessely-Headington, but focused, as usual, on moving forward.

South Bishop Ranch was a better prospect, on trend with Minnelusa fields both north and south. I leased some state and federal lands totaling 480 acres. I also negotiated a drilling option on a 160-acre tract owned by Chevron. But another key 160-acre lease, an unleased federal lease, was not available. That problem was eventually solved thanks to a golden opportunity that existed for oil speculators in the 1960s—inexpensive lotteries for leases of federal lands. The Bureau of Land Management (BLM) offered unleased federal lands with clean titles, cheap yearly rentals, and 10-year terms at monthly drawings that cost applicants only \$10 to enter. The then-popular oil slogan “The best bargain in the oil business is a new federal lease” was patently true. Prized leases sold for thousands of dol-

lars, plus the lease winner typically would reserve an override, assuring him or her of oil and gas income if the lease proved productive. A few months later, our lease came up in the drawing. Several hundred people filed for it including my wife and me. On the day of the drawing, I called the BLM and got the name of the winner, a woman who lived on a ranch near Cheyenne, Wyoming, and quickly negotiated a sublease from her, beating out slower bidders for her land.

We staked the first well on the federal lease. When we reached the Minnelusa reservoir at a depth of 9600 ft, it was oil-saturated. We ran a drill stem test and recovered over 7000 ft of oil fill-up with no water. We had a water-free oil discovery probably capable of producing 500 bbl of oil per day. Wessely called and offered congratulations; Clare was pleased; Ed was overjoyed. We made the front page of *Petroleum Information*, the Rockies' largest oil news publication. The well was officially completed in August 1968, for 610 bbl of oil per day.

Nine years later in 1977, Wessely-Headington received a record-breaking offer and sold all their interest in the field to Polumbus Petroleum Corporation. I also sold my override for \$160,000, the most I had ever made on one project. I was so pleased at the closing that I stopped on my way to the bank to make a copy of the check for framing. When I got to the bank I found that I had the copy but I had left the check at the printing shop. I believe I broke the record for the 100-yard dash, racing back to find the check still in the copy machine! The cumulative production for South Bishop Ranch now stands at 5,170,378 bbl. The discovery well on the federal lease produced 818,641 bbl and is now abandoned.

South Bishop Ranch was a turning point in my career. I had come up with the geologic idea, sold it to Wessely-Headington, leased the lands, negotiated the Chevron option, secured the important federal lease, obtained the drilling permit, sat the well (as well as the three development wells), and represented Wessely (the operator) at the spacing hearing before the Wyoming Oil and Gas Commission. My override paid a lot of bills for 9 years. I

had done the whole deal. These results gave me the experience, confidence and financial support to go forward.

My Advice to You

Whatever success I have had I attribute to perseverance and tenacity. If you have a good idea, don't ever give up—keep trying. Once, we netted a commission of a half-million dollars from a geologic idea that emerged from a 40-year-old publication I found. The indus-

try's inherently high risk requires intelligence and honesty in order to compete with integrity and skill. Also, you need to be able to experience and overcome the disappointment of many dry holes for, hopefully, the thrill of an oil discovery. We have the good fortune of living in the greatest country in the world giving us many opportunities, two of the best being mineral ownership of lands by its citizens and government support of entrepreneurship.

Hans H. Krause



Career History

Born November 1937

- | | |
|------|--|
| 1955 | Junior assistant in Chemical lab, Compañía Shell de Venezuela (CSV) |
| 1956 | MS Geology, Imperial College of Tropical Agriculture, Montana State University & University of Kansas on a CSV scholarship |
| 1963 | Production Operations/Production Geologist, Exploration Manager, CSV |
| 1976 | Exploration Manager, Maraven (formerly CSV, after nationalization), |
| 1997 | Retired from Maraven as Exploration and Production Manager |
| 1998 | Vice-president and Director, Shell companies in Venezuela |
| 2002 | Consultant, active in Venezuela and Colombia |

My Proudest Accomplishment

Training the Venezuelan E&P professionals who followed me, just as I had been trained by those who preceded me.

My Biggest Disappointment

Drilling dry exploration wells. It could be argued that a few were in the “necessary dry hole” category, that later led to discoveries. But others could have been avoided with better 3D seismic coverage.

Anecdotal Story

In 1991, I was appointed Maraven's Exploration and Production Manager. My main task was quickly finding new light- and medium-gravity oil to sustain the company's production of 960,000 bbl/day. We examined our options and decided that the most promising opportunity lay in reexploring existing fields in western Venezuela, some on land but most in Lake Maracaibo, and began this by recording a 3,500 km² 3D seismic survey over our entire lake acreage. At the time, it was one of the larger 3D surveys in the world—and likely one of the most difficult to record because of the intense production operation activities simultaneously going on there.

To interpret the data, we created teams staffed with production geologists, reservoir engineers, and geophysicists. Sensing a technical disconnect between the reservoir engineers and the geophysicists, we arranged for the former to attend a week-long course in 3D interpretation, and some became very skilled seismic interpreters! This created the desired

technical link among all three specialties and very soon the teams began to identify new opportunities, some for adding new oil and others for improved management of the known fields. In the 5 to 6 years that followed, the company was able to add every year about 200 to 300 MMbbl of light- and medium-gravity oil to its reserves with these new finds in its production areas.

My Advice to You

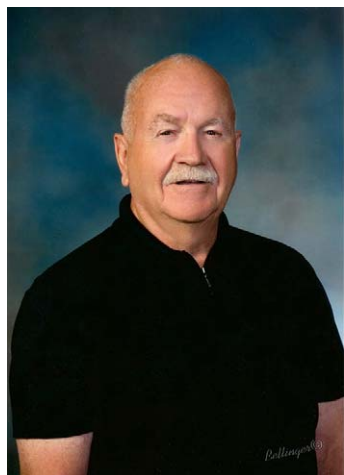
Make sure that you enjoy what you do. Associate with smart people, deal with them fairly and challenge them intellectually. Be interested in many different things, and find links

between them. Remember that difficult problems generally require very imaginative solutions. And don't let hubris ruin the rewards of a successful career.

Acknowledgments

I am indebted to many individuals who helped me along in my career. But I owe the greatest debt to G.C.K. "Stalky" Dunsterville. He was a brilliant Shell petroleum engineer, later president of CSV, with whom I shared an interest in orchids during my later teenage years, and who invited me into the fascinating world of oil and gas.

Ben E. Law



several international countries, including Canada, Brazil, Germany, Hungary, Romania, England, Ireland, Switzerland, Ukraine, Russia, China, Australia, New Zealand, South Africa, Mauritania, Mali, India, Pakistan, and United Arab Emirate, as well as several states.

My Proudest Accomplishment

The proudest moment in my life is to have married Susan in 1960. Together, we are very fortunate to have our son's family (David, Molly, Kaeden, and Camden) and our daughter's family (Kristin, Perry, Adam, and Ryan).

Career History

Born 1938, in Drain, Oregon

1958–1962	US Marine Corps, First Force Reconnaissance Co.
1967	BS degree Geology, San Diego State University
1967	USGS summer geological field assistant
1969	MS degree Geology, San Diego State University
1969	Texaco, Denver, Colorado
1971	U.S. Geological Survey, Denver, Colorado
1994	Honorary Doctor of Science degree from the All Russian Petroleum Research and Exploration Institute (VNIGRI), St. Petersburg, Russia
1998	Formed Pangea Hydrocarbon Exploration, LLC and worked in

In terms of my career, I have a couple of accomplishments that I'm particularly proud of. In 1975, while employed by the USGS, I became aware of the occurrence of hydrocarbons in nonstructural and nonstratigraphic accumulations on the north plunge of the Rock Springs Uplift in southwestern Wyoming. Not only were the hydrocarbons not trapped in conventional structural or stratigraphic traps, the hydrocarbons occurred in lithologies with very poor permeability and porosity. In 1979 I, along with coauthors Charles Spencer and Neely Bostick, presented the results of that work at a geological conference in Oklahoma. Since then I have published several papers focusing on unconventional resources (then referred to as basin-centered accumulations). As a conse-

quence of those published papers, I have received several domestic and international invitations to work with or make presentations concerning unconventional resources.

My Biggest Disappointment

I have been very fortunate to have not experienced any serious disappointments during my geological career.

Anecdotal Story

Fortunately for me, my very first employment opportunities were greatly enhanced through the leadership and mentoring by Fred (Pete) Peterson and Charles (Chuck) W. Spencer. During the summers of 1967–68, I was a geologic field assistant with the US Geological Survey, under the leadership of Pete Peterson. In that capacity, I worked in the Kaiparowits Plateau region of southern Utah and northern Arizona. I was so impressed with the geology and scenic wonder of the area that it solidified my dreams of being an explorer working in remote and unexplored areas.

Then, immediately after graduating from San Diego State University and undergoing a few job interviews, I met Chuck Spencer, the Division Geologist for Texaco's southern Rocky Mountain region. The experiences I had with Chuck were extremely beneficial while working in different areas of the Rocky Mountains. Chuck introduced me to the world of formation pressures in the context of exploration. After leaving Texaco in 1971, our paths crossed again at the USGS where we worked together on several domestic and international projects. Over a period of many years his family and my family became very good friends.

During my tenure with the USGS I had a 5-year work assignment in Russia. The project involved exploring for conventional and unconventional resources in Russia. In order to effectively conduct the work, I worked with several Russian geologists looking at several basins, primarily located west of the Ural Mountains. To be more effective in this project, I decided to learn Russian. So, during the following months, I took a few Russian language courses. Eventually, I became fairly

good speaking and understanding Russian, if the person I was talking to was patient and spoke slowly. I think the mere task of trying to speak Russian impressed my Russian colleagues and made them more relaxed, comfortable, and willing to discuss any subject. However, on one occasion my attempt to test my Russian didn't work out so well. While staying in a St. Petersburg hotel and using my best Russian, I needed to inform the hotel clerk that I was expecting a Russian visitor who was going to take me for a short cruise on the Neva River and that I would be returning in the late evening. She listened attentively and then responded in English by saying "*you would be better understood if you spoke in English.*"

My Advice to You

- Be honest, sincere and tenacious.
- Listen objectively to the views and opinions of others.

David T. Lawrence



Career History

Born July 27, 1955

1977	BA in Geology from Lawrence University, Wisconsin
1978	Geology Instructor, Yavapai College, Uranium Geologist, Plateau Resources
1980	Coal Geologist, United States Geological Survey, Wyoming
1982, 1984	MS & PhD in Geology and Geophysics, Yale University
1984	Research Geologist, Shell Development Company
1992	Chief Geologist and New Play Manager, Deepwater, Shell
1995	Vice President Shell Offshore Properties and Capital; GM Shell Find and Develop Co.
1999	Vice President Exploration and Development, Shell Exploration and Production Co.
2002	Vice President Strategy & Executive Vice President Investor Relations, Royal Dutch Shell
2006	Executive Vice President Global Exploration, Royal Dutch Shell
2009	EVP Exploration and Commercial, Americas, and Global Head of Exploration, Shell
2014	Chairman, Lawrence Energy Group

My Proudest Accomplishment

In my career, I'm proudest for working hard to make a difference for our industry, whether it was research, bid rounds, drilling wells, working with professional associations, or meeting with companies, stakeholders, or investors. I'm fortunate to have had the chance to help some great people explore, discover, and

develop new plays, prospects, and fields onshore and offshore across six continents and to do it safely. The world needs the energy our industry provides and I'm grateful to have been given the opportunity and proud to contribute my part.

My Biggest Disappointment

My greatest disappointment is that I wasn't able to drill some important and very prospective new plays I wanted to drill over the years. Regrettably, you can't always win the game if you can't win the politics. The lost opportunities eventually were replaced by projects in other countries.

An Anecdotal Story

In my early career a great mentor at Shell, Jim Clement, pulled me aside right after my twin daughters had been born and told me "You'll work on a lot of prospects and drill a lot of wells, but your daughters will only be young once. Treasure each moment."

I remember when I went to my first AAPG conference. I was overwhelmed by the energy of the attendees, by the technology and equipment on display, by the number of people and the sheer magnitude and scale of it all. I wondered how I would ever manage to compete in such a world filled with so much expertise. But I tried to learn as much as I could, on everything from (of course) petroleum geology and geophysics, to rigs and reservoir models to engineering and finance, and in a few years I felt like I belonged. I've never looked back.

When I moved to New Orleans in 1992 to be Chief Geologist and New Play Manager for Shell in the deepwater Gulf of Mexico, a senior manager at the time took me aside and told me "Dave, I've got good news and bad news. The good news is you're in charge of everything in water depth greater than 4,000 ft." I asked him what could possibly be the bad news. He said "You've got no money." This is how I learned the land side of the offshore business and the value of good partners. Na Kika, Perdido, Boomvang, and Luna (King)

were some of the offspring of that early venture.

My Advice to You

- If you are more focused on your career advancement than finding oil you are likely to fail at both.
- I've never regretted having a good technical background when evaluating oil and gas prospects and deals. Continue to learn all aspects of the business throughout your career. And if you are evaluating a prospect and don't understand something, ask questions until you do. Otherwise, let the prospect pass.
- "Drill deep in pay" applies to more than just oil and gas.
- Be the one person who figures out a way to get a difficult task done rather than being one of the 99 people who say it is impossible.
- And, as I always remind myself, the fans didn't pay to see Babe Ruth bunt!

Robert G. Lindblom



Career History

Born 1925

1943–1946	WW II, US Army Air Corps
1948	AA degree, Duluth Jr. College
1950	BS degree Geology, University of Chicago
1950	Geology Summer Field Seminar, University of Wyoming
1950–1951	Graduate Studies, geology and petroleum engineering, University of Minnesota
1951–1990	Standard Oil of California later named Chevron Corp.
1975	Began association with Stanford University as lecturer on oil and gas field development and formation evaluation in the Petroleum Engineering Department now named the Energy Resources Engineering

(ERE) Dept, School of Earth, Energy and Environmental Sciences.

1985 Appointed Consulting Professor (ERE), now Adjunct Professor, and teaching two courses in Well Log Analysis.

1991 Petroleum Consultant

1992 Oil and Gas Advisor to Stanford Managements Company on concerns relative to University lands with mineral rights given by alumni and friends to the University.

1992–2000 Appointed by California Governor Pete Wilson as Petroleum Geologist member of the State of California Board of Registration for Geologists and Geophysicists. Vice President 1993–1994 and President

1994–1996 My tenure on the Board was one of my proudest accomplishments as a petroleum geologist in being able to serve the citizens of California relative to their health, safety and welfare.

My Proudest Accomplishments

After college, I accepted the job offer from Standard Oil of California to be a geologist in Bakersfield, California. I had been to California twice during my college and Army Air Corp years but never to Bakersfield. I later learned Bakersfield is the Houston of California for the oil and gas business.

It was the start of 40-year career with SOCAL, later named Chevron. I had the opportunity to travel to remote areas such as Alaska for wellsite and fieldwork and shorter

travels in California to drill ships in the Santa Barbara channel and offshore Long Beach and Huntington Beach. The various work efforts were challenging but always with very equal rewards.

The work in the oil and gas business taught me how important it is to respect and interface with other disciplines to arrive at a complete picture of an exploration or development prospect necessary for management approval. I stress that to my students in my introductory lectures in well logging when I show slides of the derrick floor with two to three roughnecks coming out or going in the hole with drill pipe, and how important team work is to a safe, speedy, and successful job.

There are many specific skills a geologist must have to do his job in a most positive way that are not taught in college. Working for a large integrated oil company gave me opportunities through trips, courses, and seminars sponsored by Chevron that were valuable and true learning experiences.

And so important were the lifetime friendships made in my 40 years with Chevron. This included both within Chevron and outside Chevron working on various oil and gas projects—and also on the golf course! Then there is my 64-year membership in AAPG, which has been so very important with friendships, advancing my geologic skills, and giving back to my profession through volunteering and serving the Association in many ways.

I became a member of AAPG on January 1, 1952, 6 months after beginning my job as a geologist with Standard Oil Co. of California (now Chevron) in Bakersfield, California. However, my first introduction to AAPG was in 1950 during my senior year at the University of Chicago. The annual meeting of AAPG was held in Chicago and I and other students from the geology department had the opportunity to attend the meeting and it was an experience I still remember. I met some of the officers of AAPG including President C.W. Tomlinson, Vice President Theodore Link, and Henry Toler and Alfred Bell. And then to see and hear the giants of geology such as Frank Morgan, Lewis Weeks, Robert Dott,

and Kenneth Landes at that meeting, I knew when I started my career as a petroleum geologist I would join AAPG. I have attended more than 40 AAPG annual meetings and since the 1986 meeting in Atlanta, I have not missed an annual meeting in the past 30 years. The annual meetings allow attendance at technical sessions to hear timely and important presentations on many subjects relative to our industry and the exhibits show the latest technical development of a variety of tools and their application to the exploration and development for oil and gas. And, importantly, the lifetime friendships and camaraderie fostered at these meetings are not forgotten and are renewed each year. One of my most rewarding efforts with AAPG was serving on various committees as member and a chair. I also was most fortunate to be elected Vice President of AAPG in the 1993–1994 term and was honored to receive the Distinguished Service Award in 1992, Honorary Membership in 1999, and the HoD Distinguished Member of the House Award in 2010.

I have lived in California during my career with Chevron and after retirement. This has allowed me to be active in the local Pacific Section AAPG. I served as an officer in the San Joaquin Geological Society and President of the Pacific Section, and have been a member of the AAPG House of Delegates representing the Section and local societies for more than 15 years.

My Biggest Disappointment

Following a lengthy career in any discipline, one must think of their accomplishments and missed opportunities. While at Chevron, I had the opportunity to accept a position in both Sumatra and Bahrain. However, I did not take the offers when given for specific reasons—our children were young, but primarily it was the job position and activity I was doing at the time. The first time I was very active with the development of a Chevron discovery in the west Los Angeles urban area including Beverly Hills. There were two discoveries, the East Beverly Hills and the San Vicente fields, both discovered in the mid-1960s and developed following the building of drill sites

designed to fit/blend into an urban area. The East Beverly Hills field has produced over 130 MMbbl of oil. The second offer came at time when I was the Districts Development Geologist in the Sacramento Valley. The seismic development of acoustic velocity offset with the bright spot and amplitude anomaly for gas identification was used by Chevron in the discovery and development of significant gas reserves. With two to three rigs active following the discovery and in joint partnership with other operators, more than 95 wells were drilled and completed.

Anecdotal Story

After 5 years in Bakersfield, my boss told me they were doing a special study of the Cretaceous Forbes Formation for natural gas development in Chevron's Sacramento office, and I was being transferred there. I told him I was enjoying my work in Bakersfield and would like to stay, and he said, "Bob, your paycheck will be in the Sacramento office at the end of the month—if you want it, be there." It was one of the best and most significant moves I ever made at Chevron. Also, Tom Wright is a very close friend and a colleague for more than 20 years at Chevron, and I asked him to write my citation for the AAPG Distinguished Service Award that I received in 1992. He accepted and I quote a part of the citation "...to his efforts on behalf of petroleum geolo-

gists and our industry, Bob Lindblom has brought the same qualities of common sense, integrity, perseverance and good humor that earlier made him a perennial champion in oil patch golf tournaments on the West Coast. With these talents, he has sustained AAPG and its Pacific Section as they traversed the economic traps and roughs of the past decade."

My Advice to You

I must emphasize the following:

- Training and giving advice from an experienced geologist to younger geologists, as they are called today Young Professionals, are so important and allow extreme satisfaction for both the giver and the receiver.
- The opportunity to serve the community in ways that reflect the importance of geology to its safety and welfare should be considered in a positive manner with its many challenges and equal rewards.
- Always respect the various disciplines necessary to the success of an oil and gas venture, from exploration through its development or with other industry-related projects. This discipline interface is very important and one must listen rather than talk—you always learn when you listen.

Richard A. Lorentz



Career History

1979	BS Geology, Oklahoma State University
1981	MS Geology, University of the Philippines
1981	Development Geologist, Funk Exploration, Oklahoma City
1986	Exploration Manager, Anglo Suisse Pakistan, Karachi
1988	Production Geologist / New Ventures Manager, Asamera Oil / Gulf Indonesia, Jakarta, Indonesia
1998	Manager Asia Pacific: Elf Aquitaine, Singapore
2000	Cofounder & Director, Pearl Energy, Singapore
2009	Cofounder & Director, KrisEnergy

My Proudest Accomplishment

I wrote the business model (on six bar napkins that are now framed) to build a sustainable oil and gas company in South East Asia. This has been tested and proven successful in the formation of two publicly traded companies—Pearl Energy and KrisEnergy—which over the last 16 years have employed hundreds of staff and supported countless family members. Employment and education for these families from dozens of countries are my greatest accomplishment.

My Biggest Disappointment

I've had a wonderful career and finding a real disappointment is difficult. Not all the wells I have been involved with have been successful, but there are way more winners than losers.

Anecdotal Story

There are so many, but two come to mind. While working for a company in Indonesia, Asamera (which was renamed Gulf Indonesia), with acreage in north and south Sumatra, two exploration wells are particularly memorable: the first a spectacular failure; the second a huge success, both drilled in the early 1990s.

We drilled the Kuala Langsa—one well to test a very large carbonate feature in the North Sumatra Production Sharing Contract (PSC). Everything worked perfectly, more than 500 ft of 30% porosity filled to spill, and a little over 13 TCF. All that remained was testing. Those were the days when we relied on SSB communications, and on the day of testing, the presidents of Pertamina, Asamera, and Gulf Canada, among others, were crammed into the radio room to hear the results. Initial flow rates were near 300 MMft³/d, when somebody spoke the immortal words: “What do you mean it won't burn?” 82% CO₂.

On a happier note, we drilled the Dayung—one on a large structure distal to all known reservoirs. It was just too big not to drill prior to relinquishing that part of the PSC. As expected, no tertiary reservoirs were encountered, and at what was supposed to be TD, pre-Tertiary schist was tagged, just like

every other well in the region. In this case, for reasons we have never been able to determine, the drilling continued for another 50 m, where the well drilled into a gas-filled granite wash with more than 1,500 m of column and almost 2 TCF of resource. The discovery of the Dayung Field opened a new play type with well over 15 TCF discovered thus far, and was the field that kicked off one of the largest pipeline projects in Asia.

Isn't Mother Nature fun!

My Advice to You

Participate actively in as many industry societies as possible; the network of friends and contacts you will develop will last years. Always treat your colleagues and employees with the utmost respect and fairness and always put your own reputation at the top of your personal values.

Jeffrey W. Lund



Career History

Born 1947, in Jamestown, New York, on the Devonian Shale, 50 miles north of Drake's Well

1969	BS Geology, Case Western Reserve University, Cleveland, Ohio
1969–1974	Amoco Production Company
1973	MS Geophysics, University of Houston
1975–1978	Clark Oil Producing Company
1977	MBA Finance, University of Houston
1978	Southland Royalty Company merging into Burlington Resources
1991	Ashland Exploration
1998	Kerr-McGee Oil & Gas
2004 -	Access Exploration
2009	Lay line Energy and Corridor Oil & Gas LP

My Proudest Accomplishment

Connecting with and helping young geologists through my roles in oil companies, the Houston Geological Society, AAPG, and SIPES. As President of HGS in 1998 I promoted the concept that “geology is our profession, not just our job.” Our profession of petroleum geology, as Michel Halbouty taught us and Scott Tinker reminds us, is unique in its contributions of energy and other natural resources to society. We should be proud of our profession and communicate that attitude to future generations!

The best way I found to communicate this concept was the merging of a photo montage

of the 1924 AAPG Convention attendees with a photo of the HGS NeoGeos to help in marketing the 2002 AAPG Annual Meeting and HGS scholarship fund raising. That photo demonstrates how our profession grew to embrace young people, women, and a more relaxed outlook (no starched collars and fedoras).

My Biggest Disappointment

Not being able to convince the corporate management of Ashland to delay their strategic exit from upstream oil and gas until we had a chance to demonstrate how horizontal drilling and 3D seismic could extract huge value from Ashland's offshore Nigeria production-sharing licenses. The sale occurred anyway, and the acquiring company implemented our business plan (without hiring me or my staff) and increased production from a few thousand BOPD to more than 100,000 BOPD in a short timeframe.

Anecdotal Story

I have had the good luck to see multiple new plays and major projects materialize on legacy acreage positions once considered valueless:

- Early in my career I was bitterly disappointed to find out that I was being assigned to the Permian Basin instead of the exciting new Offshore Gulf of Mexico exploration team (this was around 1971). I worked the Midland Basin for 2 or 3 years, learning about carbonate reservoirs and how to use subsurface cross sections as a critical exploration tool. In 1974 I changed jobs to finally get in on all the offshore romance. Forty years later a prospect in the southern Midland Basin crossed my desk, which was a dead-ringer for a stratigraphic Wolfcamp field I had worked at Amoco. Recognizing the potential, which was not captured in the generator's presentation, I convinced business partners and clients to take the deal in 2009. We're still drilling development wells!
- Burlington Resource's predecessor company had the commanding mineral owner-

ship position in the Williston Basin, a legacy of the building of the Northern Pacific Railroad. The Williston was considered an unexciting place until our CEO made the Billings office drill the first horizontal Bakken well in the late 1980s. Few observers today recognize how the Bakken story started.

- The same company inherited El Paso Exploration's San Juan Basin Cretaceous Mesa Verde production, which had the annoying trouble zone called the Fruitland Formation. Another unexciting place until the same CEO made the Farmington office try a completion in the Fruitland, and the most prolific coalbed methane play in history resulted.
- Ashland exited the "dead" Appalachian Basin where it operated thousands of marginal Devonian Shale shallow vertical wells, some dating back to the 1800s. The purchaser flipped the acreage and the successor found they owned a huge position in the "new" horizontal Marcellus Shale play.
- A few years ago, a consulting assignment led me to help a fellow geologist sell a deep prospect in south Texas. A disappointing expensive wildcat proved noncommercial and was plugged. However, it had mud log shows in the Eagle Ford Shale and some offset operators were apparently actually making Eagle Ford completions east and south. After some technical homework, lease renewal, and searching for new participants, we ended up with an Eagle Ford oil window development project with dozens of horizontal producers.

Conclusions: Serendipity, patience, a little new technology, and a diverse geological background for reference can produce amazing results where there was past disappointment and pessimism!

My Advice to You

- Young people: if you are attracted to geoscience, pursue it, no matter where we are in the economic commodity cycle!
- Our profession is unusual in that it is a calling that bonds us with colleagues through the shared body of earth science

knowledge and our curiosity about nature. We bond with geologists of other cultures and we bond across generations.

- When I return to a college reunion, I can't find anyone who has had as much fun in their career as me. It's hard to explain to an accountant, an engineer, or a lawyer why a field trip is fun!
- Finally, in your daily work, use all the available data and make subsurface cross sections rather than pretending seismic lines answer all your questions.

Fiona MacAulay



Career History

Born 1963, in Walsall, United Kingdom

1974–1981	Queen Mary's High School for Girls & Queen Mary's Grammar
1981–1984	BS (Hons) degree in Geology from University College London
1984–1985	MS degree in Sedimentology from Reading University
1985–1989	Mobil North Sea Limited (London)
1989–1990	Amerada Hess Limited (London)
1990–1996	British Gas E&P (London, Komi, Vietnam, Trinidad, Singapore)
1996–2010	Consultant and BD for Quad, Swiftdale, OCS and Independent
2010	Rockhopper Exploration PLC (London), Chief Operating Officer
2015	President Elect, AAPG European Region

My Proudest Accomplishment

My proudest accomplishment has been my contribution to the opening of a new hydrocarbon province of the North Falkland Basin, which we now believe will ultimately yield a billion barrels of oil. Having joined Rockhopper immediately after the Sea Lion discovery well in 2010, I was lucky enough to play a key part in the ensuing appraisal program, and not just from a subsurface perspective. As a small UK AIM-listed company with 100% equity in the licence, it is not enough to just come up with well locations—you need to raise the money to drill them! Over a 2-year period, we drilled 10 wells as operator with

100% equity, partnered in an additional six wells, acquired 3D with two vessels, performed two full test programs, cut 455 m of full core, farmed in to additional acreage and, most importantly, raised US \$450 million to pay for it all. That is about as frantically busy as it gets in the E&P industry! The Sea Lion Complex has audited contingent 2C resources of over half a billion barrels of recoverable oil and, notwithstanding the current oil price environment and associated challenging industry outlook, is looking towards a project sanction leading to first oil in 2020.

My Biggest Disappointment

Je regret rien—not entirely true, but close! In the exploration world, there is always the “one that got away” and for fear of upsetting my colleagues I’m not going to go into the biggest of those, but they will know what it is.

As petroleum geologists, we often use the term “technical success” for a well that has provided us with some useful information to work out the story. However, for every technical success there is a commercial disappointment and it’s probably good not to forget that.

Anecdotal Story

I thought it would be good to focus on something a little different, and that is how technology has helped, hindered, or even blurred our roles over the last 30 years or more. Back in 1985 I was probably one of the first graduate intakes for whom computers would revolutionize their working life—no desktops back then, but a computer room (and, yes, the computer did indeed take up the whole room) in which a digitizing tablet was attached to a terminal, enabling us to come in day or night and digitize the GR, resistivity, and sonic logs received by fax from the rig. We were able to run some basic petrophysics, instead of using our hand-held HP calculators with the programmable cards (already a status symbol).

Today, with real-time technology, we can sit at home watching the LWD logs and drilling parameters as we edge toward and through the targets (I still can’t help myself

getting up several times a night for an important well), whether we are the operations geologist whose job it is to be tracking the results, or the interfering boss who just can't keep their nose out of the action.

And this, of course, is just one example of how things have changed during my career—so is it a good thing or a bad thing? Of course, progress is fantastic but does it take away some of the autonomy and responsibility with which we were so “lucky” to have been charged? The answer is yes, it does; and consequently, writing this piece has given me a new personal goal, which is not to interfere and to give back some of that responsibility to our hugely competent next generation, and to remember that despite the technology, we still need the skill sets to understand the underlying geological processes that created the pore spaces and fluid fills that define our roles as petroleum geologists.

My Advice to You

I am often asked what my advice would be to women in what is still inherently a male-dominated environment, particularly at board level in the energy sector in the UK. My answer is always the same: in your career you should strive to be a professional, a person and not “a woman.”

Take every opportunity that you feel comfortable taking while maintaining your highest standards, and remember that every good day should include both learning and mentoring but, more than anything, fun.

Remember that every day is “women's day.”

Acknowledgments

First, of course, to my long-suffering husband and family who put up with the absences, the travel, and the disruptions of weekends and holidays with the mention of “I've just got a quick conference call!”

Getting into geology in the first place revolved around my desire to attend the boys' school instead of the girls'—geology being the only subject that enabled that ... followed, of course, by the encouragement of my first geol-

ogy teacher, Steve Law, who persuaded me to ditch my career choice of physiotherapy to study geology instead; to my first taste of the industry as a summer intern with Vic Colter, an amazing mentor; and to my second great mentor, Richard Hodgkinson—‘Hodge’—of Mobil, and to Katrine Holdoway, who was the most capable female geologist and role model I knew; and to all my colleagues and peers along the way of all disciplines. And latterly to Sam Moody and Pierre Jungels who believed in me enough to appoint me to the board of Rockhopper.

Mazlan Madon



Career History

Born 1961, in the state of Johor, Malaysia

1984	BS Geology, Southampton University, UK
1992	MS Geology, University of Malaya, Kuala Lumpur, Malaysia
1996	PhD Earth Sciences, Oxford University, UK
1984	Petronas Laboratory, Sedimentology
1993	Oxford University
1996	Petronas Research, Regional Studies and Basin Analysis
2009	Petronas Carigali, Basin Analysis
2010	Petronas E&P Technology Centre, CO ₂ storage
2012–2017	Commission on the Limits of the Continental Shelf
2013	Petronas Malaysia Petroleum Management, Basin analysis
2013	Fellow of the Academy of Sciences, Malaysia
2014–present	President of the Geological Society of Malaysia

My Proudest Accomplishments

Professional: Completing my PhD at Oxford in 3 years. Wrote most of the chapters in the Petronas book *Petroleum Geology and Resources of Malaysia* (1999). In the early 1990s, as a pioneer member of Petronas geoscience skill group committee, I was involved with designing the skill development program that is currently being used. I also developed and delivered the training courses on basin analysis and sedimentology and conducted many sedimentology field trips for young

Petronas geoscientists, as well as students from Universiti Teknologi Petronas. In 2011 and 2013, I was awarded “Best Line Trainer-Role Model” for my contributions to skill development. In 2012 I was nominated by Malaysia as a candidate for the UN Commission on the Limits of the Continental Shelf (CLCS), and was elected as a member for the term 2012–2017. I was also elected Fellow of the Academy of Sciences Malaysia in 2013.

Personal: Married to Flora Shahab in 1985 and raising our daughter, Nadhila, born 2 years later.

My Biggest Disappointment

My biggest disappointment was not seeing any significant development in geoscience research activity despite having endured several leadership and organizational changes throughout my 25 years in the organization.

Anecdotal story

I believe in giving my best to make the most of a situation. After graduating with a BS in geology from Southampton in 1984, during a downturn in the oil industry, I managed to get a job doing routine lab analyses of well samples at the Petronas laboratory. I quickly trained myself in sandstone petrography and diagenesis, but soon saw an opportunity to pursue a master’s degree at the University of Malaya in Kuala Lumpur. In 1987 I registered as a part-time student to work on the sedimentology of clastic reservoirs in the Malay basin. When my supervisor, Dr. Azhar Hussin, went on a sabbatical a year later, the then head of the geology department, Professor Charles Hutchison, took over that role. Studying part-time was quite a struggle but I finally received my MS degree in 1992.

Being in the research organization provided me with the opportunity to further my studies under a staff development program. I reasoned that if a PhD was going to make a big impact on my career and skill development, I had to be learning something totally new. Hence, in 1993 I took leave to work on my PhD on the tectonics of the Malay basin at

Oxford University under Professor John F. Dewey.

What happened upon my return was even more impactful. In 1996 Petronas decided that a book on the petroleum geology of Malaysia was long overdue, and having just rejoined with a PhD, I was quickly assigned as one of the three full-time authors. "Petroleum Geology and Resources of Malaysia" was published 3 years later in 1999 and has become an important reference, including for my own training courses.

I remained in research for the next 10 years, leading projects on domestic and international basins while continuing to be involved in the skill development program. In 2009 when Petronas Research was reorganized yet again, I asked to be seconded to Petronas Carigali, which allowed me to work on overseas opportunities. The assignment lasted only for a year, as by the end of 2010 I was back in research and reassigned to a task force on a CO₂ sequestration project, until 2013 when I moved to MPM's basin analysis and promotion department.

In 2008–2009 I had the privilege to take part in a government's project to prepare Malaysia's submission of its extended continental shelf claim to the CLCS, as provided under the UN Convention on the Law of the

Sea (UNCLOS). Subsequently, because of my prior involvement in Malaysia's own submission, I was nominated as Malaysia's candidate and got elected to the 21-member scientific body on 6 June 2012 for the term (2012–2017).

My Advice to You

Be humble and kind. Always enjoy what you're doing, and be honest with yourself and who you work with. Expand your knowledge outside your expertise. Get involved in professional societies and meet with people outside your own familiar environment. Attend any relevant courses if you can, but there is no substitute for reading.

Acknowledgments

I was fortunate to have worked with individuals who have helped me along the way: Azhar Hussin and Charles Hutchison at Universiti Malaya, John Dewey and Tony Watts at Oxford, and Khalid Ngah, my former boss at Petronas Research, who provided me with the opportunities to develop. I am also grateful to the late professor Neville Haile, who was our research advisor and later became a family friend while I was at Oxford. Many thanks also to Dato' Abu Bakar Jaafar, my predecessor at CLCS (1997–2012) and Ab Rahim Husin, former under-secretary of the National Security Council, for their support and trust.

Bill Maloney



Career History

Born October 1955, Bronx NY

1979 BA Geology, Hunter College
1981 MS Geology, Syracuse University
1981 Shell Oil Company
1986 Pecten International,

International Division of Shell Oil Co.
1995 Director International E&P, Davis Petroleum
1997 Exploration Business Unit Leader FSU & Middle East, Texaco Inc., Houston
1998 V.P. Exploration & New Ventures, Texaco Inc., London
2002 Senior V.P. Global Exploration, Statoil ASA, London, Stavanger & Oslo
2010 Executive V.P. Development & Production North America, Statoil ASA Houston
2016 Non-Executive Director, Trident Energy; and Energy Advisor, Warburg Pincus

My Proudest Accomplishment

My time at Statoil from 2002–2015 has to be the period in my career that I am most proud of. In 2002, I started with the ambition to revitalize exploration in Statoil. The journey began by establishing the Global Exploration (GEX) Leadership Team, a team that changed a bit over time but was consistently a wonderful group of smart and caring individuals. Together we built a portfolio composed of acreage in USA Gulf of Mexico (GoM), Brazil, Canada, UK Faroes, Algeria, Libya, Egypt, Indonesia, Tanzania and more, in addition to existing international holdings in Nigeria and Angola. Statoil has had exploration success as a partner or operator in USA GoM, Canada, Brazil, Angola, UK, Algeria, and Tanzania. Some of these discoveries have been sold, some are producing today, and some are waiting for development.

After a sabbatical, I returned to Houston in 2010 to be the leader of Development & Production North America, and a member of Statoil's Corporate Executive Committee. Once again, I was very fortunate to have a terrific leadership team. When we started in 2010, production from the US and Canada was about 75 KBOE/D. When I retired from Statoil in September 2015, US and Canada production was over 250 KBOE/D and rising. Fields in the deepwater GoM started to come on line. Production efficiency in the Bakken, Eagle Ford, and Marcellus consistently improved. During this time, Statoil acquired Brigham Exploration, yielding a strong position in the Bakken as well as a great team to join Statoil in Austin, Texas.

As I look back on my time at Statoil I'm thankful for the opportunity to work with many impressive individuals who collectively made a difference.

My Biggest Disappointment

This one has more to do with regret than disappointment. Over the 35 years that I have worked in the oil and gas industry, nothing has had as deep an impact on me than layoffs. As a young supervisor at Shell, being asked to carry out a staff reduction was when I first realized the pain and disappointment associ-

ated with such an action. In the late 1990s at Texaco's London office, I was again faced with the same situation. In this instance, I better understood why these actions needed to take place, but that did not mitigate the feelings of sadness, frustration, and regret that accompany such events. The experience of any downsizing is certainly felt hardest by impacted employees, but still quite sad for all concerned. Unfortunately, we presently find our industry in another downturn, with some companies having to reduce staff. While I am not directly involved in the current actions, my feelings of sadness and regret remain.

Anecdotal Story

In 1995 I had a job interview with Marvin Davis. This is something I will never forget. Marvin sent his own 737 to Hobby Airport to pick me up and take me to Palm Springs, CA. There was a town car waiting on the tarmac to whisk me off to Marvin's weekend retreat. The view upon entering was breath-taking: a large sitting room with floor to ceiling glass windows looking out onto a lovely pool, beyond that a sunken tennis court, then the golf course and lastly the mountains. Once I sat down with Marvin we spoke for over 3.5 hours and at the end he asked me if I wanted the job. My response was I would seriously think about it. He then asked if I could stick around a bit longer as there was someone he wanted me to meet. Some moments later the front door opened and there stood former President Gerald Ford! Marvin introduced us and then President Ford started telling me how over the years he had invested in some of Marvin's oil and gas ventures and did quite well. I could not believe it. Here is President Ford promoting Marvin to me! It was the most unique job interview I have ever had.

My Advice to You

No matter where you find yourself in your career, it is important to maintain a good work-life balance. The time you spend away from work is vital to you and your family. It will only make your hours on the job even better. So, take time for yourself and your family, do the things you love to do, and do them often.

Ernest A. Mancini



Career History

Born February 27, 1947, Reading, PA

1969	BS in Biology, Albright College, Reading, PA
1972	MS in Zoology, Southern Illinois University, Carbondale, IL
1974	PhD in Geology, Texas A&M University, College Station, TX
1974–1976	Exploration Geologist, Cities Service Oil Company, Denver, CO
1976–2009	Professor in Geology (Assistant/Associate/Full), University of Alabama, Tuscaloosa
1982–1996	State Geologist & Director of Geological Survey of Alabama and Oil and Gas Supervisor; and Director of State Oil and Gas Board of Alabama, Tuscaloosa
1995–2007	Regional Director, Eastern Gulf Region, Petroleum Technology Transfer Council
1998–2009	Director of Center for Sedimentary Basin Studies, University of Alabama, Tuscaloosa
2005–2009	Distinguished Research Professor in Geological Sciences, University of Alabama, Tuscaloosa
2010–2012	Research Professor in Geology and Geophysics, Dan Hughes Chair in Geosciences, and Director of Berg-Hughes Center for Petroleum and Sedimentary Systems, Texas A&M University, College Station, TX
2010	Professor Emeritus, Geological Sciences, University of Alabama, Tuscaloosa

My Proudest Accomplishments

- As a professor, seeing my graduate students defend their thesis and dissertation research, receive their degrees, and

achieve success in the geoscience profession.

- As State Geologist, completing our geologic mapping project for the state that culminated in the publication of the first statewide geologic maps for Alabama since 1924, at 1:250,000 and 1:500,000 scales.
- As a researcher, hearing from oil and gas operators in the Gulf that the research findings we presented at technology transfer workshops contributed to their success in drilling a wildcat well or producing additional oil from an existing well.

My Biggest Disappointment

From 1974–1976, I worked offshore Alaska and California for Cities Service Oil Company in Denver. Our main assignment was to prepare for Outer Continental Shelf (OCS) lease sales, including the St. George Basin, Bering Sea. I spent parts of two summers collecting samples on the Alaska Peninsula for biostratigraphic and potential reservoir and source rock analyses. I also made trips to Anchorage to study well cuttings and cores for wells drilled on the Alaska Peninsula in preparation for the sale. Our team recommended OCS blocks for lease consideration that we determined had the highest potential based on our interpretation of the geologic history of the basin. We eventually published our geologic interpretation of the area in *Geology* in 1978. Unfortunately, the sale was cancelled, and thus, we do not know if the St. George Basin contains commercial quantities of hydrocarbons.

Anecdotal Story

In 2007, we were nearing completion of a 5-year USDOE project on sedimentary basin analysis and petroleum system characterization and modeling for basins in the central and eastern Gulf Coastal Plain. At this point in such projects, we usually conducted knowledge transfer workshops as part of our Eastern Gulf Region PTTC program to share our research results and to obtain a sense from industry regarding our findings. We knew

that industry had information, particularly seismic data, that could support our interpretations. Although industry could not share these proprietary data, they would typically ask questions regarding our conclusions. At this particular workshop in Tuscaloosa, I proposed that the principal source rock in the eastern and central Gulf was Upper Jurassic Smackover lime mudstones and that secondary source rocks were Upper Cretaceous Tuscaloosa and Eagle Ford marine shales and Lower Cretaceous carbonates. I further stated that we were having difficulty modeling a source rock for the natural gas produced from Cotton Valley sandstones. An independent operator participating in the workshop suggested we look at the Upper Jurassic Bossier shale beds as a potential source rock. We followed the operator's advice and collected core samples from the Bossier. We had the samples analyzed for source rock potential and performed petroleum system modeling studies using the Bossier stratigraphic, geochemical, and thermal history data. We found that the Bossier had potential to be a source rock for the natural gas produced from Cotton Valley reservoirs and had potential to be an unconventional reservoir, because the modeling indicated that much of the gas generated was not expelled but rather was retained in the Bossier. Thus, we interpreted the Bossier-Cotton Valley Group in Louisiana as a self-sourcing confined unit and, in part, an unconventional petroleum system. In 2008, industry announced the discovery of an unconventional gas play in Louisiana referred to as the Haynesville-Bossier Shale.

My Advice to You

- Formulate a career plan and have a strategy to execute your plan successfully, but be prepared to modify your plan as new opportunities and challenges arise.
- Remember that learning does not stop when you receive your degree, but is a life-long endeavour. Remaining at the front of your field requires continued reading of current scientific and engineering papers and attending technical presentations, short courses, and technology workshops, and then discussing the information and

concepts you learned from the papers and workshops with your colleagues.

- Most importantly, continue to build a mental catalog of the outcrops studied, cores described, and seismic data sets interpreted. This is your expanding database from which you will generate new ideas and concepts.
- In making decisions, keep an open mind and remain flexible, evaluate the information available, and make a timely decision knowing that the drilling of the next well may require reevaluation of your decision. But, nevertheless, make a decision.
- There will always be surprises. Differences in the observed geology associated with new discoveries from the expected geology based on information prior to drilling illustrate the uniqueness of our science compared to other sciences, because we formulate an interpretation from our experiences and existing data and then when we see a new outcrop, core, or seismic line we revise our interpretation and enhance our knowledge. These opportunities contribute greatly to our profession being challenging and enjoyable.

Acknowledgments

I thank my colleagues and students for the opportunity to work with them these many years. I learned a great deal from them and the collaboration was stimulating.

Randi Martinsen



Career History

1971	BS in Earth and Space Science, State University at Stony Brook, NY
1975	MS in Geology, Northern Arizona University, Flagstaff, AZ
1974–1979	Geologist, Cities Service Company, Denver, CO, both Exploration and Production
1980–2011	Consulting Geologist, Laramie, WY
1981–1995	Lecturer, Dept. of Geology and Geophysics, University of Wyoming, Laramie
1995–2014	Senior Lecturer, Dept. of Geology & Geophysics, University of Wyoming, Laramie
2011	Principal, Hydrocarbon InSight, LLC
2015	Lecturer Emeritus, Dept. of Geology & Geophysics, University of Wyoming, Laramie
2014–2015	President, American Association of Petroleum Geologists

My Proudest Accomplishments

Professionally, I feel very honored to have earned the respect of the many AAPG members who elected me AAPG President. The *experience of being AAPG President* was very rewarding, especially being able to interact with AAPG members within the U.S. and abroad.

Although I've given numerous presentations and written several papers that I hope have contributed to our understanding of petroleum geology and inspired a number of Wyoming students to enter the petroleum

industry, I believe my most valuable contribution to the profession has been the creation of the Rocky Mountain Rendezvous (RMR) job fair. I started the RMR in 2002 as part of the RMS-AAPG annual meeting activities. It was so successful we decided to make it an annual event. We have had up to 450 students from 55+ universities and colleges attend. As many as 26 companies (mostly oil and gas) sponsor the event each year, and I've been told by recruiters (many of whom got their job at the RMR) that it is one of their favorite recruiting events. It is so uplifting each year during the RMR to engage with so many talented geoscience students from across the country who are eager to enter the petroleum industry and to be able to help them obtain jobs.

My proudest accomplishment is having maintained my career while raising three glorious children, along with my husband Jim Steidtmann, who is also a geologist. Consulting and academia provided the flexibility for me to continue working as a petroleum geologist while actually raising children. In fact, I was the proverbial soccer mom...having been coach to my children's various soccer teams. I feel very fortunate to "have had it all."

My Biggest Disappointment

Although I proposed and drilled quite a few wells while I was a production geologist, I never got to drill any prospects while an exploration geologist for Cities Service. Cities was a very data- and technical-oriented company, but a little risk averse in terms of wildcatting. I wish I had had experience during my early years with a more exploration-oriented company or been fortunate enough to have worked with or under a true wildcatter. However, it's never too late and the game isn't over yet.

Anecdotal Story

I had never been a good public speaker in college, but I knew if I wanted to get ahead I'd have to change that. Toastmasters didn't interest me so I took acting lessons, which were a lot of fun and really helped me. After

having done a lot of work on Hartzog Draw I decided to submit an abstract for the RMS-AAPG meeting. I was very surprised when my abstract was rejected. However, shortly afterward a member of the technical program committee called me and told me that my abstract was rejected because the technical program chair thought Hartzog Draw was too important a subject for a female to present. After thinking things over for a bit I started calling the geologists that were working Hartzog for various companies. I explained what had happened and asked them if they would refrain from sharing information with the “designated speaker.” To a person, no one shared anything and the “designated speaker” had to go back to the technical program chair and say he couldn’t put together a presentation. Subsequently, the RMS-AAPG came back to me and asked if I would present the paper, which I did. The strong support I received from my Hartzog “network” that stood by me and tight-holed the designated speaker is one of the most rewarding and positive experiences of my career. Receiving the Levorsen Award for the presentation was icing on the cake.

My Advice to You

Never be afraid to take a new path in your career or your life. You never know where the path will go. When I got married and moved from Denver and the fabulous Denver geoscience community to Laramie as a consultant, I felt I was putting my career on a back burner. Shortly after I moved to Laramie, the Geology and Geophysics Dept. asked me if I would teach a course in petroleum geology. At the time I was extremely busy, but I thought a connection to the department would be good, so I agreed. I did not have a PhD but I’m sure it helped that I had published papers, given presentations at technical meetings, taught workshops, led field trips, and was the recipient of AAPG’s Levorsen Award. I had established myself as a successful Rocky Mountain petroleum geologist by being active in various professional societies and by actively contributing to the profession. At the time I did all those things because I loved petroleum geology, not because I thought they would help my

career or build a network. But that is exactly what they did and I subsequently came to understand how important being professionally active is to a career. Then in the mid-1980s, the industry experienced a significant downturn and my consulting business dried up. Many of my colleagues in Denver lost their jobs and some ended up changing careers. Fortunately, I had my position with the University that eventually evolved to becoming a full-time lecturer and researcher. So, while I had feared my career would suffer from my move to Laramie, it broadened my career to include academia as well as consulting, and perhaps even saved it during the downturn. And when I moved to Laramie I never dreamed that one day I would become AAPG President, which has been the highlight of my career. *So, do not be afraid to take a different path. You never know where it will lead you.*

Acknowledgments

I have been fortunate to have some very important mentors in my life. The first was my mother, who not only told me that I could do and be anything I wanted, but demonstrated it with her adventurous and curious spirit and by providing opportunities that opened my eyes to the wonders of the world. I am indebted to many geologists who over the course of my education and career have supported me, encouraged me, and taught me so much. If Pete Rose hadn’t convinced me to take his introductory geology class, which hooked me, I would never have become a geologist. Even though he left my university and academia after only 2 years, he continued to mentor me through graduate school and my early career. At Cities I had three very important mentors: Bob Colby, Vernon Hill, and Rod Tillman. Much of whatever success I have had I owe to them. Not exactly a mentor, but Robbie Gries has been a role model for me and for many others. Most importantly, I’m grateful for my husband, Jim Steidtmann, who has always supported and encouraged me.

Michael McWalter



Career History

- 1976 BA Natural Sciences (Geology), University of Cambridge, U.K.
- 1976 Voluntary service overseas at Catholic Mission Fatima, Banz, Western Highlands Province, Papua New Guinea (PNG)—a young philanthropist far from home teaching sciences, social sciences, mathematics and English at a remote provincial high school.
- 1978 Post-Graduate certificate in Education (Physics), University of Cambridge, U.K.
- 1980 MA, University of Cambridge, U.K.
- 1980 Exploration Logging Int. Inc. in Philippines, India, Pakistan, Bangladesh, China, and Papua New Guinea—a young geologist on exploration wells in rice paddies, tea-plantations, deserts, and offshore, including Typhoon Alley (off Hainan Island)—learning at the thrilling end of the business
- 1987 Government of PNG: Senior Petroleum Geologist; Chief Petroleum Geologist; Director, Petroleum Division; and then Advisor—inspecting, monitoring, promoting, managing, assessing and regulating the petroleum business of a young developing nation and training its people
- 2004 Petroleum Advisor for USAID, Asian Development Bank and World Bank variously in PNG, Cambodia, Bangladesh, Turkmenistan, Sao Tome & Principe, Liberia, Ghana, Uganda, Seychelles and South Sudan—taking one’s omnibus experience of

leading a Government petroleum agency in a developing nation from oil and gas discovery to initial oil production, commencement of refining, and nurturing the development of its natural gas for LNG development—on the road to help nations manage and regulate their petroleum resources with good governance

2016

Advisor to Port Moresby Petroleum Co. Ltd.—a new start small independent petroleum exploration company, based in PNG, where a much older Government oil man has now crossed the Rubicon to the investment side of the petroleum business and is trying to have fun looking for oil and gas himself!

My Proudest Accomplishments

- Being on the oil discovery well—Iagifu 2-X in 1986 that discovered the Kutubu oil fields in Papua, New Guinea, which underpinned the commencement of Papua, New Guinea’s oil production in 1992
- Building a cadre of local petroleum officers in the Papua, New Guinea Dept. of Petroleum & Energy with experience, skills and excellent qualifications that has percolated into the entire PNG petroleum industry and beyond
- Planning and promoting natural gas development from discovery through post-drill resource appraisal and economic, fiscal and policy analysis to eventual LNG production in Papua, New Guinea. which started LNG shipments in May 2014
- Organizing and chairing all four of PNG’s Petroleum Conventions in 1990, 1993, 1996 and 2000, which are memorialized in four splendidly edited technical volumes
- Taking my experience of leading a government petroleum office to developing nations and helping them to develop a firm foundation for good petroleum industry management, regulation and governance
- Being appointed as a Commander of the Royal Order of Sahametrei (C.S.) by Royal

Government of the Kingdom of Cambodia for distinguished services to the Cambodian National Petroleum Authority

- Receiving the Order of Loguhu (O.L.) from the Governor General of Papua, New Guinea in 2016 for “service to commerce through contributions to the regulation and development of the oil and gas industry (of PNG) and to the community.”

My Biggest Disappointments

- Finding most of the overthrust and foreland structures in the Papuan fold and thrust belt in Papua, New Guinea were full of natural gas rather than oil—at least, for the most part, the gas was *wet gas*!
- Witnessing the advent of corruption in the industry and the misuse of Government petroleum revenues for self-aggrandizement and malfeasant expenditures rather than for the good of all the people of a nation, in far too many places.

Anecdotal Story

“*Drill Towards the Oil*”—as Director of Petroleum for the Government of PNG, I worked with and directed Chevron during their appraisal of the Moran oil field in the mid-1990s to drill a side-track well across the axis of the Moran anticline to test the back limb oil-bearing potential, to “drill towards the oil”: meaning more along-strike towards the known oil up-dip and nearer the oil-bearing culmination of the structure; i.e., towards the oil, rather than simply perpendicular to strike and into what was to be the water-wet back limb. Chevron even made T-shirts to celebrate such clairvoyant and prognostic advice from the Government, “**Drill Towards the Oil**”—they heralded, which was later proven to be right! A Chevron drilling engineer said they liked the concept, but were not always sure where the oil was! Perhaps the Government could help?!

My Advice to You

Never stop learning; the petroleum industry is a marvelous business that demands a wide range of professional skills and disciplines as well as absolute integrity and accountability

(if you want to sleep at night). If you are a geologist, learn a little about petroleum law and regulations; if you are petroleum lawyer, learn some petroleum geology.

Try to understand the enormity of the business, so you can appreciate the value of your industry colleagues in their different disciplines, but always keep abreast of your own professional discipline and pet subjects.

And, if you have the chance, never stop teaching; take your science and knowledge to the younger petroleum professional so that they may learn from your experience—it is so rewarding and satisfying to nurture and mentor the next generation, and of course it is the best manner of learning!

Acknowledgments

I owe my initial interest in the oil and gas industry to my father, a learned science teacher, who one day brought home from school some brochures of Standard Oil (published in the UK by Esso, most likely) which depicted the quest for oil and gas around the world; it all seemed so adventurous.

Later, I recall building a 7-ft-high working oil rig out of *Meccano*, a model construction kit similar to the *Erector Set* in the USA, for which I had to fashion a wooden Kelly to pass through my rotary drive powered by a 9-volt Meccano electric motor; I won the school hobbies exhibition prize that year, but I found no oil!

I idly collected rocks as a teenager without the framework of geology before going to Cambridge to study physics, but daunted by the extreme indulgence in mathematics by my physics teachers at Cambridge, I opted to pursue geology instead, which seemed more tangible and less stratospheric than physics. I must acknowledge my geology teachers at Cambridge who, despite my resistance, instilled the principles of geology into me that I find so valuable today.

As a young petroleum geologist in the Philippines, I was guided by Eric Jacobsen, a former geologist of the then Chevron and Texaco affiliate, Amoseas (Philippines) Inc., who together with Professor Manny Tamesis at

the University of the Philippines and the small Filipino company called Oriental Petroleum Inc., introduced me to AAPG and its wonderful bookstore, which I perceived to be a treasure trove for a knowledge-hungry young petroleum geologist.

This has led me to cherish AAPG and its stock of great petroleum geologists, many of whom I have encountered at so many AAPG events around the world and whose dedication to our science has inspired me to follow suit.

Susan M. Morrice



Career History

Born 1952, in Belfast, Northern Ireland

- | | |
|------|--|
| 1976 | BA, Trinity College Dublin in Natural Sciences |
| 2002 | Cofounded Belize Natural Energy, BNE, Attended Educo Seminar |

My Proudest Accomplishment

My proudest accomplishment was cofounding Belize Natural Energy (BNE) utilizing the Educo Model, and discovering the first oil in Belize when everyone said it was impossible. This true story is now a beacon showing everyone they too can follow their dreams, with laser beam focus, and make a positive difference in the world.

My Biggest Disappointment

My biggest disappointment was realizing that not everyone wants to make a difference. The silver lining is understanding that it is a series of mindsets imprinted onto our unconscious mind that covers our spirit and hold us back. Once we understand this aspect of our mind then we can be the imprinter/the Visionary, and not simply a passenger, but take the

wheel in partnership with Life and make a difference for the good of all.

Anecdotal Story

When asked about my concept behind the tremendous success of the International Pavilion at the AAPG Convention in 1994, I was perplexed that I could not explain. I did not know what makes one person go for their professional goals, while others settle for less or even stagnate. For more than 5 years I researched everything to gain an insight into how the human mind functions. What is the secret to success? At this same time the statement of the famous oilman Wallace Pratt rang so true “Oil is found in the minds of men.” I was determined to understand how to more fully utilize our minds and I wanted to find a model or system with research that supported Socrates’ concept of “Know thyself.” I wanted a course that was University proven with practical known results and one where the originator walked the talk. I found what I was looking for in 2002; the Educo Seminar. Immediately after completing the seminar, I cofounded Belize Natural Energy with my Belizean partner Mike Usher and a group of like-minded people. We were armed with the steps to transform a fragmented dream into an invincible Vision: to discover oil and make a difference in Belize.

Against all odds and with the very first well ever drilled by BNE...on June 24, 2005, we discovered the first oilfield in Belize. Sadly, my dear partner Mike Usher passed on June 24, 2004, *exactly* one year prior. All the wells in the original field are named after him and he is constantly with us.

BNE has produced over 10 Mbbl of light crude in 10 years from 10 wells. We are the

number one revenue generator in the country and are 99% Belizean. We have expanded our Vision to be “**the total energy solution throughout Central America and the Caribbean.**” We are welcoming visiting dignitaries from all over the world to tour BNE and learn about the Holistic Business Model. Visitors instantly notice the energy and creativity of our workforce and the pride they have knowing they are making a tremendous difference in their country. Today, we are 175 strong at BNE and have been committed from the birth of the company to train everyone in all things related to energy. Each employee has the added advantage of attending the same Educo Seminar I attended 14 years ago.

Our expanded 2020 Vision and our holistic business model attracted the attention of the leaders of the UAE. The Model inspired them to join forces and pioneer an historic country-to-country partnership, signed at the United Nations on October 1, 2015.

My Advice to You

When we discover how our mind works and draw out/live our full potential, we are not only more useful to ourselves but to humanity. Wallace Pratt’s wise words motivated and inspired me to research how our mind works for its peak performance and this has enabled me to pass on the discovery behind all discoveries... at BNE we call it “the oil within!”

Kenneth E. Peters



Consulting Associate Professor,
Stanford University

- 2009 Alfred Treibs Award, Geochemical Society
- 2011 AAPG Honorary Member Award
- 2016 Alfred Wegener Award, European Association of Geoscientists and Engineers

My Proudest Accomplishment

I contributed to a paradigm shift from (1) the general belief that petroleum geochemistry is a niche science with little practical value to (2) broad acceptance of geochemistry as a key tool in exploration, production, and development. I have authored many books and papers, but made a point to publish ~40 papers in *AAPG Bulletin* or *AAPG Hedberg Conference* volumes that emphasize the value of geochemistry for our readership. Over the years, I have taught geochemistry and basin and petroleum system modeling (BPSM) to many hundreds of college and industry students and I have mentored many PhD candidates at Stanford University.

Part of my contribution to the broader acceptance of geochemistry has been to popularize computerized BPSM. This tool offers management predictive capability and, at least as important, assessment of the degree of certainty in the predictions. An aphorism attributed to the statistician George Box

Career History

- 1972 BA Geology, University of California, Santa Barbara
- 1974 MA Geology, University of California, Santa Barbara
- 1978 PhD in geochemistry, University of California, Los Angeles
- 1978 Senior Research Geochemist and Geochemical Coordinator, Chevron; and Consulting Professor, U.C. Berkeley, Stanford University
- 1993 Associate Geochemical Advisor, Mobil and Oil & Gas Consultants International (now PetroSkills)
- 1999 Senior Research Associate, ExxonMobil
- 2002 Senior Research Geologist, U.S. Geological Survey and Consulting Associate Professor, Stanford University
- 2008 Science Advisor, Schlumberger; Instructor, Schlumberger NExT;

reads: “All models are wrong, but some are useful.” BPSM allows us to build models that reconstruct the geohistory of the rocks and fluids in basins. These models are never perfect because of the complexities of nature, but certainly many models are useful tools that reduce the risk associated with finding and developing petroleum. BPSM is a quantitative extension of the qualitative petroleum system concept popularized by Les Magoon and the late Wally Dow. The value of BPSM is reflected in the fact that many petroleum geochemists now call themselves basin modelers. Geochemistry is critical input for BPSM, but also plays a key role in calibrating model output. Even in these difficult times, young PhDs from our Stanford University BPSM program are in high demand by industry.

My Biggest Disappointment

I have experienced many disappointments, but continue to learn from them. However, one disappointment seems to defy a solution. After 38 years in our profession, I recall scores of mostly young geoscientists who lost their jobs during economic downturns. Downturns are a fact of life, but it remains perplexing to me why our industry seems to be unable to plan for them and mitigate their effects. For example, during downturns many leveraged university research programs fail, not because they lack innovation, but because the industry funds dry up. Every company handles this issue differently, but I continue to search for evidence that our industry can plan for the next downturn to reduce the magnitude of the hire-fire cycle and maintain support for leveraged university research.

Anecdotal Story

When I entered the profession, geochemistry was not generally accepted as a critical tool by most geologists. In many companies, drilling more wells was more important than using the petroleum system concept to high-grade decisions. I recall a Senior Vice President who crossed paths with me in the hallway at a company meeting in the early 1980s: “*Say, you’re Ken Peters the geochemist aren’t you?*” Yes. “*Isn’t it true that geochemistry is a mature science?*” Not really... In retrospect,

my off-the-cuff answer was underwhelming. I doubt that any science is mature, particularly petroleum geochemistry. Today, there are a huge number and variety of geochemical questions that remain unanswered and most have major implications for chance-of-success in the exploration and exploitation of conventional and unconventional resources.

My Advice to You

- Do what you love with courage and honor; you may not become wealthy, but you will be happier and healthier. You may even outlive the tax collector, but don’t count on it.
- Give back to your profession: volunteer to serve as a reviewer, lobby management to allow you to submit an abstract for the next AAPG meeting, mentor young professionals, or teach eager students. Your management may not credit you for these endeavors, but you will be investing in the future of others, your profession, and your development as a geoscientist.
- Remember that the search for new petroleum resources remains one of the most challenging and rewarding of all professions!

Acknowledgments

I have been blessed by the community of petroleum geoscientists (and possibly by a bit of serendipity), but I owe special inspiration to the following colleagues (in alphabetical order): Stuart Archer, Ken Bird, Steve Brown, Ian Bryant, Alan Burnham, Jeremy Dahl, Gerard Demaison, Jerimiah Forsythe, Steve Graham, Thomas Hatchel, John Hunt, Ian Kaplan, Keith Kvenvolden, Tom Lorenson, Les Magoon, Mike Moldowan, Oliver Mullins, Drew Pomerantz, Scott Ramos, Brian Rohrbach, Allegra Hosford Scheirer, Martin Schoell, John Snedden, Oliver Schenk, Vikram Unnithan, Bjorn Wygrala, Cliff Walters, Dietrich Welte, and John Zumberge. Last, but certainly not least, I acknowledge the support of my wife Vanessa and my son Brent, who continue to tolerate my work ethic.

Henry Pettingill



Career History

1983–1995	Exploration Geologist and New Ventures Geologist, Shell
1996–2002	Subdirector, Exploration Portfolio, Exploration Manager, Spain and Algeria, Repsol YPF
2002–2013	Director Exploration, Noble Energy
2013–2015	Director Business Innovation, Noble Energy
2016–present	Chief Geoscientist, Noble Energy

My Proudest Accomplishment

I was able to play an important role in Noble's entry into the undrilled deepwater Levant basin, where we subsequently discovered more than 40 TCF of gas, giving two countries their own sources of energy for the first time. I was able to do this because of my relentless pursuit of a long-lived passion for deepwater exploration, and many years practicing that craft around the world. I am also proud of having built Noble from a staff of 40 geoscientists to a diverse staff of more than 150, which included starting a college recruiting program that has transformed more than 60 geos (from 35 grad programs) into successful oil and gas professionals.

But my proudest memory is about human beings. My first two days at Repsol in Madrid were rather unique. Initially set to work off-shore Spain, I was transferred twice my first day, ultimately arriving in the Algeria Business Unit. The next morning at the coffee

machine, glancing at the message board, I saw a long letter from the labor union protesting the hiring of "an American Geologist," which cited that such a person was not qualified to work Spain. As the company had only a few employees who were not Spanish and no Americans, I immediately knew the challenge I faced. I had become very confident with rocks, but not with human relationships, and now I had to excel in that realm, in a culture I did not know, and which spoke a different language. But I loved Spain, so I went to school on their culture, their history, and everything else. I was relentless in approaching my Spanish coworkers to spend time with them. Every one of them eventually accepted me in one way or another, probably because they could see the effort I made. My wife Rosario took on an active role, helping me with Spanish while bonding closely with our hosts. It was a long slow journey, but through time, I had a positive impact, ultimately achieving things I never could have imagined. I only came to understand this accomplishment when my colleague Juan Mallo Garcia pulled me aside and explained, "We call you 'the integrator' because of the ease with which you integrate with our Spanish staff." My last assignment there was as Exploration Director of Algeria and Spain. I will never forget the send-off the organization gave me, capped off when my younger staff (all in that same Union!) presented me a Real Madrid jersey, then kept Rosario and I out dancing until 4 AM.

My Biggest Disappointment

I will never forget the day I was informed of my transfer into Gulf of Mexico Operations. I had gone through an incredible 6-year period of personal and professional growth, generating prospects and then emerging as a true expert in deepwater reservoir prediction. I was ready for something even bigger, but that seemed like the opposite. But then Paul Brizolara, Shell's Operations Manager, explained to me that the company had a growing set of surprises with their deepwater wildcats, a problem that I was uniquely positioned to

impact. I subsequently learned that my team leader, Sue Waters, had a particular genius for leading well operations, and along with the geophysicists within my network, we were able to unlock some of the earth's secrets. At the same time, I gained the critical skills that can only be obtained from real-time interpretations during drilling. I also gained the level of understanding of Operations that I would need later as an Exploration Manager. But the most valuable lesson I learned was that the impact I can have is always defined by the needs of those around me, not by my fragile ego. Shell expressed its gratitude to me 6 months later when I was transferred into the Research Lab to implement a world-wide turbidite outcrop study for a multidisciplinary team. Looking back, my biggest career disappointment was one of the best things that ever happened to me.

My Advice to You

First and foremost, *follow your heart*. Only your heart can keep you on the road to happiness and allow you to pursue your destiny. Second, *be excellent today*—in all you do, and are asked to do. Otherwise, you will not have to worry about career development. Third, start every week by taking a moment to *decide the impact you will have* by the end of the week—to your life, your work, your company, and your world. Maybe just a small outcome, or a small step toward a bigger outcome. If you relentlessly focus on that outcome, you'll find a way to make it a reality, no matter how difficult it seems. Finally, *take on things that are too big for you*, or maybe even seem impossible. Walt Disney once said "doing the impossible is fun." Be inspired by the challenges that seem bigger than your current ability—those that you don't know how you'll achieve. That is the mindset of an Explorer...

Bradford E. Prather



Career History

1979	BS degree Geology, University of Kansas
1981	MS degree Earth Sciences, University of New Orleans
1982	Exploration Geologist, Team Leader and Regional Chief Exploration Geologist, Shell
2014	Consultant, CarTerra, LLC
2015	Adjunct professor, Kansas University

My Proudest Accomplishments

I am most proud of the turbidites research team we built at Shell. I have never worked with such a creative and talented group of geologists, engineers, and geophysicists at any other time in my career. I am also proud to have been selected as the first recipient of AAPG Robert R. Berg award for outstanding research, as this was the culmination of my two-decade commitment to understand and share what I learned about the global deepwater play both within Shell and to a lesser degree with the industry.

My Biggest Disappointment

I can't really say I have had a big disappointment.

Anecdotal Story

When I worked for Shell in the early 1990s, we always referred to any Southwest Airlines flight between Houston and New Orleans as the "spy train." These flights were full of industry people and I was, as well as my fel-

low travelers, eavesdropping on any conversation within earshot—as if we could actually learn something important—well, we were all young and foolish then. This was universally recognized in Shell at that time so we were advised not to discuss business while onboard these flights.

It was on one of these flights that Jim Booth and I happened to find ourselves sitting together. Up until this moment we had been working on a project whose objective was to better predict mudrock composition in Late Neogene intraslope basins in the Gulf of Mexico, but hadn't spoken for weeks. As we whispered to each other, making sure no one could hear us, we came to the realization that our attempts to calibrate mudrock composition of certain seismic facies to help with “trend-curve entry”—this is what we at Shell called the technical process of predicting sandstone bounding lithology used in quantitative

amplitude analysis, actually was more indicative of where we were finding reservoirs. Moreover, we realized that if one would differentiate a convergent seismic facies class from an earlier scheme devised by Gary Steffens and Adrian Alley, into convergent by thinning from convergent by baselapping types, we could not only polarize reservoir risk but have a means of quantifying reservoir uncertainties as well. By the end of the flight we had worked out a redefinition of seismic facies classes and a classification key, ultimately leading to advances in our understanding of the stratigraphic evolution of intraslope basins. As we prepared to land in Houston I remember looking at Booth and saying “You know, Jim, I think this could be important.”

As a technical guy I found these moments of epiphany, when the science and business converge, extremely exciting.

My Advice to You

Save your money when times are good, because in this industry a downturn will be just around the corner.

Clayton H. Riddell



Career History

Born 1937

- 1953 Summer student field geology assistant, Manitoba Mines Branch (while still in high school)
- 1959 BS Honors, Geology, University of

- 1959 Manitoba, Canada
Geologist, Western Cordillera, Arctic, The California Standard Oil Company (later Chevron)
- 1968 Consulting geologist, Surface mapping party chief; prospect development
- 1972 President, Cavalier Energy Ltd.; Canadian junior public oil and gas company
- 1975 CEO, Paramount Oil & Gas Ltd., private startup oil and gas company that I established
- 1978 Paramount goes public raising \$5 million on Toronto Stock Exchange
- 1978 CEO of Paramount Oil & Gas Ltd., spun off three additional public companies
- 2014–2016 Executive Chairman, Paramount Resources Ltd., handed CEO duties of Paramount and other public companies controlled by the Riddell family to my children.

My Proudest Accomplishment

I am certainly proud of being recognized by the CSPG with the Stanley Slipper award and by the AAPG with the Outstanding Explorer Award. My 58-year career has seen many accomplishments of which I am proud, but the first big natural gas discovery by Paramount is certainly the most important event in my career. We acquired large land tracts along the Devonian Grosmont subcrop in northeastern Alberta. The first drilling season I took several partners to pay for the drilling of nine wells, all dry holes except the last, which had a sniff of natural gas so I completed it. For the next 9 months, we puzzled over the results and finally figured out it wasn't the Grosmont reservoir or its contents, but rather our drilling technique that led to the abandonments the previous year. The following winter I convinced partners to drill another well near the one we tried to complete. This well, using new drilling technology, encountered the pay zone at a depth of only 800 ft and a reservoir pressure of 135 psia, but when completed it had an AOF of 30 MMcf/d. We had found the answer and being such a small entity, were able to exploit it with little competition for a few years because nobody paid attention to what we were doing. The discovery was almost 100 miles from pipelines, and took five very worrisome years to get first production.

The Liege gas field has since produced 1 TCF of natural gas, and this discovery was followed by several other discoveries made by Paramount along the Grosmont trend, each with significant natural gas reserves.

My Biggest Disappointment

Once again, there have been many. I have been responsible for my share of dry holes! I spent much of my early career surface mapping in the Arctic and always had an interest in this frigid area. In 2007, Paramount formed a subsidiary and began exploring in the Mackenzie Delta in the high Arctic. We made significant discoveries over the next few years, finding over 1 TCF of natural gas, and had acquired extensive land tracts to explore and develop much more natural gas; but interminable regulatory delays, aboriginal issues, and environmental challenges kept industry from building the Mackenzie Valley pipeline. It was finally approved, but too late—it could not go forward and compete because of gas prices brought on by the shale revolution. Maybe someday.

My Advice to You

I didn't originate this thought but it best describes my advice: "It's funny, the harder I work, the luckier I seem to get."

Hans Christen Rønnevik



Career History

Born 1945, in Haugesund, Norway

1971	University of Bergen cand.real (MS degree Geology)
1971	Research assistant in marine geology at UiB
1972–73	Petroleum geologist Ministry of Industry
1973–83	Petroleum geologist in various positions in the Norwegian Petroleum Directorate
1983–84	Senior petroleum geologist in Norske Shell
1984–99	VP Exploration in Saga Petroleum implementing an organic growth strategy
2000–04	Exploration Manager and geologist in a revitalized DNO in Norway
2004–15	Exploration Manager and geologist in Lundin, Norway

2013	Honorable prize, Norwegian Academy of Technological Sciences
2015	Senior G&G advisor in Lundin, Norway
2015	AAPG Norman Foster Award

My Proudest Accomplishments

Being part of the team that from 1972–83 developed the Norwegian Petroleum Directorate into an active and unique national petroleum resource management institution.

We implemented a revitalized organic growth strategy for Saga Petroleum that resulted in an average discovery rate of more than 40% and a reserve replacement of 150% from 1984–99. An essential part of the strategy was the delegation of decision authority to the VP of Exploration within budget frames agreed with the board.

Formulated and implemented a cash flow protected organic growth exploration strategy for DNO in 2000 and Lundin Norway in 2004, which resulted in the discovery of more than 3 Bbbl of oil and a success rate of more than 40% from 2003 to 2014. The main breakthrough discoveries are Alvheim in 2003–04, Edvard Grieg in 2007, Johan Sverdrup in 2010, Gohta in 2013, and Alta in 2014.

Developed efficient exploration teams based on diversities, trust, and freedom for individuals to pursue their own ideas—within a common purpose—since 1984. The basis for organizational development has been the need for continuous fact-based knowledge and continuous better practices.

My Biggest Disappointment

The biggest disappointment was the takeover of Saga Petroleum by Norsk Hydro and Statoil in 2000. Several such mergers in the industry in the 1990s reduced the diversity and opened up for new companies with experienced people with organic growth focus. The impact of the revitalized DNO in 2000 and exploration activity by Lundin Petroleum from 2004 demonstrate that values and knowledge are created by action and change within a context of diversity.

In January 1989 Saga Petroleum experienced an underground blowout in well 2/4-14.

Petroleum flowed from a highly pressured Jurassic reservoir through casing into a shallow sand layer. The well was finally killed by a relief well in December 1989 after it became operationally impossible to kill the well by top entry. The experience of continuous learning under stress and uncertainty was well documented from a technical and human side and shared with the industry in a seminar in 1991. The operational handling of this event created a trust with the safety authority that was essential in being approved as operator in DNO and Lundin.

Anecdotal story

I took part in the virgin regional mapping, prospect generation, and evaluation of the early discoveries on the Norwegian Continental Shelf from 1972–83. In the mid-1970s I estimated the resource potential of the NCS to be 72 Bbbl. I am proud to be wrong on this estimate and see the proven resources surpass this number in 2016. In 1972, I defined the block numbering system that is used in the Norwegian and Barents Sea.

This resource mapping formulated the basis for a balanced national organic growth strategy that was implemented by awards of licenses with multiple play concepts and firm drilling commitments. Diversity in play types both at regional and local scales is a must for sustainability. Early focusing on the known will always lead to self-fulfilling prophecies that there is nothing more to be found.

In the 4th concession round it was decided to award several of the potential best blocks and the result was several of the major discoveries in the Norwegian North Sea Norway.

A major task was the planning, execution, and analysis related to NPD's operated geophysical and geological mapping in the Norwegian Sea and Barents Sea prior to activity opening for the industry. This mapping led to selection of areas for gradual opening for petroleum activities in these areas from 1979 onward in a holistic context.

The last thing I did in NPD before leaving for Shell in 1983 was to map, evaluate, and formulate the work program for the main

Snorre block 34/7. When I joined Saga in 1984, I had to fulfill my own work program. I was responsible for delineation of the giant Snorre Field and the discovery of four additional large fields: Vigdis (1986), Tordis and Borg (1987) and Tordis East (1993). In addition, the Lavrans field in 1994 and Kristin field in 1996 were discovered in the Norwegian Sea. All these fields were seen as “impossible” before proven otherwise by the drill bit.

At the end of the 1990s the NCS was considered by many to be mature in relation to organic growth. This view was not shared by the authorities who opened up for new organic-growth-focused companies and stimulated increased drilling activity.

The revitalized Det Norske Oljeselskap became the first independent oil company to be approved as an operator on the Norwegian Shelf in the new regime. The major part of DNO assets was acquired by Lundin Petroleum in 2004

In DNO we were instrumental in unfolding the oil potential of the clustered Alvheim Field with Marathon as operator after Norsk Hydro’s sale of the asset. Prior to proving otherwise by the drill bit, this 300 MMbbl oilfield was considered as gas satellites to the Heimdal Gas Field. Proper organic growth needs focus on the subsurface potential and not poorly defined asset models that look rational on paper.

In Lundin we focused our exploration on the Haugaland High, securing acreage through consecutive concession rounds leading to discovery of the significant Edvard Grieg Field in 2007 and the giant Johan Sverdrup Field in 2010. The area had been drilled sporadically by several majors since 1967. It took 40 years for the industry to unfold the potential. The key was to put the diversity of facts from existing wells in a large holistic context. All the reservoir facies were new to the NCS and the oil nonbiodegraded and under saturated.

In 2007 Lundin started an area exploration campaign on the Loppa High in the Barents Sea, an area which was also prematurely aborted as an exploration area for oil. Drilling

updip from 1980s wells resulted in the Gohta oil discovery in 2013 and Alta discovery in 2014. These discoveries have reservoirs in karstified Permian–Carboniferous carbonates with overlying Lower Triassic clastics. These were old concepts that were proven by the drill bit for the first time on NCS.

My Advice to You

Teams with will, skill, and dedication toward common purposes are those that create value over time.

Will:

- Develop new concepts in parallel with using the existing concepts
- Realize that insufficient facts can support several equally likely concepts
- Create concepts using Hutton, Walter, Wheeler, and Vail principles prior to computer modelling
- Understand that modelling and calculation do not compensate for input ambiguity
- Be diverse (and not more of the same), which is important for any creative process
- Be aware of the limits of data, technology, and tautology of theories, from which better practices will emerge
- Learn by decision making in the context of insufficient models and procedures
- Human self-referencing, which is reduced by facts and diversity, is the main obstacle for learning
- Engage in continuous honest dialogue between the people involved.

Skill:

- Seismic imaging is being developed toward broadband
- Drilling, coring, and sidetracks are keys to increased knowledge
- Continuous learning takes place on all parameters during operations
- Continuous processing and analysis during drilling should take place by the people who did the prognosis
- Adapting plans to reality (not vice versa)

- Performing corrective actions during operations comes from being flexible.

Dedication:

- Envision and share knowledge as a basis for a holistic strategy process that includes all stakeholders
- Create a relational culture based on honesty, openness, and trust

- Walk the talk
- Ask deeper questions and seek alternate solutions
- Challenge conventional truths and procedures
- Realize the nonlinearity of reality and the human perception of it.

Mark G. Rowan



Career History

Born 1954, Santa Monica, California

1976	BS, Biology, California Institute of Technology
1982	MS, Geology, University of California, Berkeley
1991	PhD, Structural Geology, University of Colorado, Boulder, CO
1982	Exploration Geologist, Sohio Petroleum Company, Denver, CO
1985	Associate/Senior Geologist, Geologic Systems, Boulder, CO
1989	Consulting Geologist & Technical Director, Alastair Beach Associates, Glasgow, Scotland
1992	Research Associate and Research Assistant Professor, University of Colorado, Boulder
1998	President, Rowan Consulting, Boulder, Colorado, providing teaching/training, consulting, and research development to the global petroleum industry

My Proudest Accomplishment

Seeing eyes widen and lightbulbs go off when teaching or otherwise explaining salt tectonics and other structural concepts. What I love about the teaching and training I do is that people take the classes because they want to rather than because they are told to, that they bring their own experience and expertise to the classroom and thus can engage in spirited discussion, and that they will apply their new understanding immediately in their exploration and production efforts or their university research. There is nothing as rewarding as the knowledge that you have made a difference and helped others be better at what they do.

My Biggest Disappointment

Ignoring faint hints on seismic data that I discounted as noise rather than anything real, simply because I didn't understand them, and then conveying that to clients. In the case I regret the most, I missed important clues that might have stopped a company from drilling an unwise, unsuccessful well; I was the one person who should have seen the risk. The moral? All of us, especially those of us in positions of influence, need to remember that just because we don't understand something doesn't mean that it's not real or can't happen. Trust the data.

Anecdotal Story

In consulting projects, the advice I give to clients usually provides moderate improvements to interpretations and to understanding the

implications for exploration and production. It is relatively rare that I have a chance to make a major impact that completely changes how the client views the potential of an area. However, one example is when I examined new, long-offset 2D seismic data in a frontier basin for an NOC. The existing exploration concept comprised supra- and subsalt plays similar to those in the northern Gulf of Mexico. I started moving systematically through the data along the margin, making notes and gathering my thoughts, but was bothered by a nagging sense that something wasn't right. After an hour or so, I came across the smoking gun in the form of faint reflections that suggested an entirely different model. With a growing sense of excitement, I found and documented other evidence supporting my idea. In essence, I had discovered that what had been considered to be diapirs, salt sheets, and minibasins was actually a complexly deformed, layered evaporite sequence, and that the primary opportunity was a presalt play similar to Tupi, at that time a recently discovered super-giant in the Santos Basin of Brazil.

I relayed my findings to the team when we met for lunch. Afterward, I put together a slide deck, including analog geometries from Brazil. By the end of the day, I was presenting my preliminary interpretation and the implications for exploration to senior management. The problem then became one of managing expectations since the presence of a working presalt petroleum system, with source and

reservoir, was unknown, but that is another story. In any case, the company subsequently drilled several presalt exploration wells that proved the validity of my interpretation and the revised exploration potential.

I continued to work with the team over the next several years as 3D data were acquired and wells were drilled and evaluated. While it remained a fun and challenging project, nothing quite matched the excitement of that first morning. It's not often that you get to have that much impact as a consultant.

My Advice to You

- First, never stop learning. Go to those conferences, go take those courses, go on those field trips. If you learn one thing that helps you make better decisions in your job—and you will—it has paid for itself many times over.
- Second, think critically. Be skeptical, challenge, and examine the underlying assumptions. Apply this to others but especially to yourself and your own models and interpretations.
- Third, learn to say “I don't know.” It's honest and it's liberating; it frees your mind to pursue alternative solutions.
- Finally, whatever you do, do it with passion. Have fun and remember how lucky we are to work with great data, on challenging problems, and with wonderful colleagues from around the world.

Elizabeth Schwarze (“Liz”)



Career History

1987	BS in Geology, Duke University
1990	MA in Geology, Univ. of Texas–Austin
1995	MBA, Tulane University
1989	Intern, GOM exploration, Chevron New Orleans
1990–present	Production geologist, development, new ventures, finance, business development and planning, and cross-functional team leadership, general manager-exploration, Chevron

My Proudest Accomplishment

A recognition that I am particularly proud of is having been selected to be one of Chevron's Earth Science Sponsors in 2008. This job put me in a global career advising role to others and a leadership role in developing organizational capability. Technically, one of my proudest moments was selling the value of a 3D seismic survey over one of the fields I worked after I left the Gulf of Mexico. I was able to convince my management as well as partners of the value proposition and the survey data made a huge difference in understanding the subsurface of the field. Lately, I take great pride in seeing the people I've hired or supervised over the years rising through the ranks to technical or people leadership roles, and I hope that some of my advice helped them be successful.

My Biggest Disappointment

I don't really have any disappointments. My geological interpretation hasn't always been correct, and I haven't always gotten the next

job that I thought I wanted, but it's all been rewarding.

Anecdotal Story

In the early 1990s, I went offshore fairly frequently out of Port Fourchon. On one helicopter ride, the pilot asked me if I was the "rig mover woman." At first I wanted to say no, but then I thought, "Yes, I'm the geologist and I have a big role in where the rig moves next!"

My Advice to You

Keep learning. I am a member of AAPG and SPE and both of those organizations are a great source of networking and learning. Seek advisors and be respectful and thankful to all who give you advice even if you don't use it. Welcome change and challenge. Do your best every day so you can go home and say "today I did my best." The industry has its ups and downs and a lot of what happens in a career is not controllable. But, if you focus on doing the right things well, you can set yourself up to take advantage of whatever opportunities come your way.

John W. Shelton



Career History

Born 1928

1949	BA, Baylor University
1949	Married Doris Smith; two children, four grandchildren
1951, 1953	MS, PhD, University of Illinois
1953	Shell Oil Company
1963	Oklahoma State University
1980	ERICO, Inc.
1990	Masera Corp., Datapages, Inc.
2000	Consultant

My Proudest Accomplishment

My proudest accomplishment has been being part of the start-up and development of AAPG Datapages. In 1988, Ron Hart at AAPG asked why we did not digitize publications. In London, Peter Wigley showed Gary Howell the possibilities of digitizing technical publications. After Gary made arrangements for a demo to the AAPG Executive Committee in Fall 1989, Masera received agreement from AAPG to digitize and market its publications in digital format. We tried a piecemeal, in-house approach, beginning in 1990 and financed by Paul McDaniel, Masera's owner. We were stumbling along until two events changed a rather dismal outlook: (1) Dave Jenkins, Conoco, asked when we were going to digitize all AAPG publications, and (2) Frank Stumpf, Byrd Press (later Cadmus Communications), demonstrated a digital *Geophysics* at a SEG convention. We hired Byrd/Cadmus to digitize AAPG publications.

Immediately thereafter, I accompanied Paul to Houston to ask companies to sponsor the digitization. Conoco, Exxon, and Marathon tentatively agreed that day to be partial sponsors of the digitization. We were able to digitize the AAPG publications with six sponsors, but a full year was required to obtain the last three. Subsequently, we received permission to digitize SEPM's JSP/JSR and then GCAGS *Transactions*. Datapages, a spin-off of Masera, was sold to AAPG at the end of 1999. It has continued to experience growth in offerings and use.

Search and Discovery, planned by Ted Beaumont, Ron Hart, and me, started in 1997, as part of Datapages. It was suspended with the sale, but was reactivated by AAPG in mid-2000. Like Datapages, it was on life support for a considerable time, but in 2005, when we received permission to post a fair number of convention oral presentations, it experienced a significant increase in postings, followed by a drastic increase in 2008, as acquisition and processing were streamlined by Administrative Editor Mary Kay Grosvald.

My Biggest Disappointment

My early career disappointments were mainly technical. They include failure to recognize the possibility of accumulation when pinchout was mapped of a unit of Dakota Sandstone in the Denver basin, failure to recognize the total depth of erosion before deposition of Miocene sand in shallow offshore Louisiana field, and failure to focus on extensive depositional slope of mud-rich Upper Cretaceous in Montana. Later in my career, the main disappointment was the initial problems in digitizing AAPG publications to get the Datapages project off the ground.

Forty years ago, a manager in London turned down my offer of an ERICO report on the Lower Cretaceous of the North Sea region for US \$30,000; yet a few months later he purchased the same report, offered by the ERICO owner, for US \$40,000.

Anecdotal Story

More than 60 years ago, a Shell farmout in the northeastern part of the Denver Basin

had a reported show in the Permo-Pennsylvanian section. That report was immediately followed by strong leasing and acquisition of minerals even as problems persisted with drillstem tests. Anxiously, a Shell rig was used to offset the farmout, but the offset proved to be dry. The alleged show, checked by very competent stratigraphers, turned out to be a surface dune-sand that a roughneck had bagged as proxy for no returns from an evaporitic section.

My Advice to You

Make the most of opportunities. Be flexible and persistent. Take full responsibility for your own professional development, and recognize your personal limitations.

Acknowledgments

I have been the recipient of immeasurable help and support from many people, especially from Doris, my wife, Harold Wanless and George White of the University of Illinois, James E. Wilson, Bob Nanz, and Rufus LeBlanc of Shell, Gary Stewart from OSU, Paul McDaniel, Peter Wigley, Rick Fritz, Steve Allen, Ron Hart, Larry Gerken, Jingyao Gong, and Mary Kay Grosvald, from ERICO/Masera/Datapages.

Orion Skinner



Career History

Born 1956

1980	BA Geology, University of Wyoming
1982	MS Geology, University of Wyoming
1982	Tenneco Oil Company
1989	Axem Resources
1998	Westport Oil and Gas
2002	Cimarex Energy
2004	Whiting Petroleum

My Proudest Accomplishment

Of all the successful projects I have been associated with over the past 34 years, identifying a new, highly productive area covering numerous townships along the southern edge of the Bakken petroleum system in the Williston Basin is the project I am most proud of. That interval, now formally known as the Pronghorn Member of the Bakken, is the newest addition to the Williston Basin stratigraphic chart, all the more significant as this is a very mature basin. The success of this project and the methodology behind the discovery ultimately earned me the Rocky Mountain Association of Geologists Explorer of the Year award in 2012 and the AAPG Norman H. Foster Outstanding Explorer Award in 2014. While that industry recognition is, in itself, extremely gratifying, it is the integrated regional geologic effort with the help of some incredibly talented coworkers behind the success that makes this project float to the top of my list.

Highly detailed correlations using several thousand wells throughout the Williston Basin tied to nearly 200 cores that had been

reviewed for facies, lithologies, and recognition of any significant depositional/erosional surfaces in the Bakken and Three Forks intervals formed the basis for the success of the Pronghorn effort and other projects in the Bakken. It was primarily through our extensive mapping and core review effort that we had formed a strong basis for the zones and facies that should have been present, including their mapped extents. While extending our core review to the southern part of the Williston Basin, we encountered an interval we had never recognized before with an open marine limestone overlying a burrowed dolomite that was stratigraphically below the Lower Bakken Shale but was clearly not Three Forks. This was the interval that ultimately was formally recognized as the Pronghorn Member. Over much of the basin where this unit is preserved it is nonreservoir and very clay rich. Source rock presence and maturity, paleogeographic reconstruction to identify where the best reservoir may still be preserved, SEM, and thin section petrography, and trace fossil paleoenvironmental interpretations all needed to be integrated with the detailed regional maps and the core-derived surfaces to identify the multiple township area where we ultimately decided to lease and where our first two horizontal wells averaged 2000 BOEPD with ongoing development.

My Biggest Disappointment

Missing opportunities or missing clues that could have resulted in more successful projects account for my greatest disappointments but also avenues of greatest learning. We are all at the mercy of our experiences and paradigms and it can be challenging to look past weak production (or dry holes) and anticipate results that could be obtained using the ever-improving and evolving drilling and completion efforts. My case in point also revolves around the Bakken play in the Williston Basin. Early tests in the central part of the Bakken play were poor producers—roughly 150 BOPD with equal amounts of water. The

reservoir didn't look like what I expected it should and those production rates could not support the costs of horizontal drilling so I ignored a very large area of the basin and its potential because of an erroneous conclusion that the production was optimized and as such couldn't generate economic wells. Then along came multistage completion efforts. Those 150 BOPD wells became 2000+ BOPD wells with the better completion methodology. By the time I was aware of these results we were late to the game and while we did get some acreage in the resulting land rush, we missed out on establishing a much more significant position.

Anecdotal Story

People have often asked me how I originally got interested in geology. I grew up in the small town of Pinedale, Wyoming, and spent my youth in the outdoors and in the wilderness areas of the adjacent Wind River Mountains. My parents would commonly take us exploring in the broad uninhabited areas around Pinedale and elsewhere in the state. I would often come across interesting and beautiful rocks and would think "I wonder what kind of rock this is?" with an answer of "I don't know." After 7 years in college and 34 years as a professional petroleum geologist, I continue the family tradition with my wife and kids—we still find other beautiful rocks and ask the same question, with the same answer. Hard rock was never my forte, but

the intense curiosity initiated in my youth to explore and see what is over the next hill or river and to try to answer the geologic mysteries embedded in the rocks continues to fuel my intense passion for geology. It is what drives me to map the next township, the next county, the next state, or possibly in the next country to try to understand the detailed stratigraphy at all levels and get a better understanding of how the basins were filled and how that sequence impacts potential hydrocarbon exploration. I always believe if I can understand the regional depositional sequence well enough, that also honors and incorporates far more detailed correlations than most geologists attempt to map, I have a better chance of finding the big play or prospect area. I'm a detail-oriented person at heart. I'm a splitter not a lumpner when it comes to correlations and mapping and commonly split fine enough to use a 2-ft contour interval for my maps even over a regional scale. Through my career, I have often found that those fine details can help identify fundamental differences in targeted horizons that may be contrary to the thoughts of the rest of industry. In those differences lie opportunities.

My Advice to You

Be passionate in what you choose to do, always embrace curiosity at all levels, and be willing to put in the extra hours that may be needed to follow the path curiosity leads.

John W. Snedden



Career History

Born 1954

1977	BS/BA Geology and Psychology, Trinity University
1979	MS Geology, Texas A&M University
1979–1983	Exploration Geologist, Mobil Exploration and Production
1986	PhD Geology, Louisiana State University
1986–2011	Mobil and ExxonMobil, Exploration, Production, Research
2011	The University of Texas Institute for Geophysics

My Proudest Accomplishment

I became project director of the Gulf Basin Depositional Synthesis research project at UT–Austin in 2011. We just celebrated our 20th year of continuous industry funding, in spite of this protracted oil price downturn. We have retained sponsors, supported new graduate students, and expanded our research on Gulf of Mexico Basin Cenozoic and Mesozoic deposition. It is notable that most oil and gas companies see the value of academic research, even during such bleak times, and that science-based decision-making is usually the best. I also greatly enjoy seeing the light bulbs go on in young student minds, after explaining some fundamental science concept and how it is applied in a practical application with seismic and well log data.

My Biggest Disappointment

My biggest disappointment has to do with the early exploration rounds in the Barents Sea of Norway. I transferred to Mobil's Stavanger office in the 1980s, feeling like I was coming into the next great exploration arena with reservoirs, source rocks, and trap types all similar to the huge oil discoveries made in the North Sea Viking Graben in prior decades. In fact, the Barents Sea reservoirs are the same age and paleoenvironment as the famous Brent Group of Statfjord Field, the largest field in the Viking Graben. Mobil had made that discovery in 1973 and there was a lot of expertise and excitement in the office. The first wells were drilled and logged, and the results were both surprising and disappointing. Despite abundant oil shows, the logs and drill stem tests showed only residual oil remained. My first visual clue to the “uplift problem,” as we called it, was in a core I described in Harstad, north of the Arctic Circle. High-amplitude stylolites in the sandstone were a sign that the reservoir had once been buried much deeper than its current 2000 m drilling depths. Mobil and other companies kept drilling in the Barents over the next several years but the results were the same—wet reservoirs with residual oil. Later apatite fission tract dating determined that the traps had experienced up to 2 km or more of post-charge uplift in several tectonic

phases. Modeling showed that under these conditions, a trap can lose its oil column through seal failure. Subsequent exploration has concentrated in areas with less uplift, but the next Statfjord field has yet to be found.

Anecdotal Story

In the mid-1990s, I worked on a Mobil research team assisting our Jakarta office with evaluation of acreage on the Kutei basin slope, east of the Mahakam delta. Total and other companies had established shallow-water production from Miocene reservoirs sourced by in-situ coal beds with a propensity for generating waxy oils. Conventional wisdom was that proximity to these coal beds was critical and deep-water areas were far too distant to charge slope and basin turbidite reservoirs. Ken Peters, an organic geochemist, suggested that oil biomarkers pointed to a lowstand, deep-water kitchen. Combined with Rick Sarg's seismic analyses and my core interpretation from key updip wells, we made the case for transported terrestrial organic matter that could source slope reservoirs and open a new exploration fairway. We published this “nontraditional” model in the *AAPG Bulletin* in 2000. Unocal and partner Mobil proved this concept worked by making discoveries like the West Seno Field. Art Saller further documented this in his 2006 AAPG paper “Leaves in Turbidite Sands.” What I learned is that if you are going to challenge conventional wisdom, bring all the expertise and fearless teammates that you can muster.

My Advice to You

You can have mentors at any age. In graduate school, I was taught about modern depositional processes from Dag Nummedal. In mid-career, I learned seismic stratigraphic techniques from Rick Sarg. Later in my career, I led the reservoir connectivity team at Exxon-Mobil to figure out the internal plumbing of global oil and gas fields. After retirement from ExxonMobil, I have spent the last 5 years collaborating with Bill Galloway, a walking encyclopedia of Gulf Basin depositional systems. You should never stop learning and collaborating.

Stephen A. Sonnenberg



Career History

1974	BS Geology, Texas A&M University
1975	MS Geology, Texas A&M University
1976–1978	Exxon Company, USA: Exploration/Production Geologist
1981	PhD Geology, Colorado School of Mines
1981–1990	Bass Enterprises: Exploration Geologist
1990–1997	Consultant/Independent
1997–2003	EnCana/*PanCanadian/*NARCO: Team Leader, Exploration Manager
2003–2004	American Association of Petroleum Geologists: President
2004–2007	Anadarko Petroleum/*Kerr McGee/*Westport: Exploitation Manager
2007	Charles Boettcher Distinguished Chair in Petroleum Geology, Colorado School of Mines

My Proudest Accomplishments

While working in industry I participated in the discovery of several oil and gas fields (Harker Ranch-Morrow SS; West Prong Creek-Minnelusa; Mandella-D SS; Meadow Springs-J SS; and drilling lots of development wells). While working at the Colorado School of Mines (2007–present), I initiated four industry-supported research consortia (Bakken, Niobrara, Vaca Muerta, and MUDTOC). These consortia have funded more than 70 students to date on a variety of research topics. Being a mentor to several hundred students has been very rewarding. On the

professional society front, being President of AAPG has been an accomplishment I am very proud of. Receiving Honorary Membership and the Halbouty Medal from AAPG is also very important to me. Also, becoming a coauthor on Richard Selley's third-edition book, *Elements of Petroleum Geology*, is something I view as a great accomplishment.

My Biggest Disappointment

Not finding a giant field yet! I am still looking, however. Geologists tend to work forever! Overall, I have very few disappointments in my oil and gas career.

Anecdotal Story

In the 1990s while working as a consultant/independent, I was putting prospects together exploring for the D Sandstone. My partners and I sold a deal to a Fort Worth company with the concept that the area needed 3D seismic to pinpoint D valley-fill channel deposits (something I had previously published on). The 3D seismic was acquired, but shallower faulting in the Niobrara Formation significantly hindered interpreting things at the deeper D Sandstone horizon (essentially destroyed the deeper seismic event). After joining the Colorado School of Mines in 2007 and starting the Niobrara Consortia shortly thereafter, I got the 1990 3D survey donated to the Niobrara research project. The result of working again on the 3D survey was to come up with a brand new structural style for the Rocky Mountain Region: Polygonal Fault Systems. So, although the first work on the data did not work, the second interpretation resulted in a brand new structural style interpretation. The moral of the story is: take a second look, you might just find a hidden nugget or two.

My Advice to You

1. Separate yourself from the crowd
2. Live each day in a day-tight compartment
3. Go the extra mile
4. Look for the seed of good in every adversity

5. Never neglect the little things
6. Never hide behind busy work
7. Never allow anyone to rain on your parade.

Acknowledgments

Three of my greatest mentors have been Bob Berg, Bob Weimer, and Frank Sonnenberg. Bob Berg was my Master's advisor at Texas A&M University. He constantly challenged all his students to do the best research possible.

He was a true inspiration in my life. Bob Weimer was my PhD advisor at the Colorado School of Mines. He is a friend, mentor, and colleague and has also made a big impact on my life. Coauthoring papers with Bob has been a huge accomplishment and something I am very proud to have done. Finally, I am a second-generation geologist. My father, Frank Sonnenberg, was always extremely motivating and always had positive suggestions during my career.

Philip H. (Pete) Stark



Career History

Born 1936

1958	BS Geology, University of Oklahoma
1961	MS Geology, University of Wisconsin (UW)
1963	PhD Geology, University of Wisconsin
1962–1969	Mobil Oil Corporation, Wichita, KS; Denver, CO
1969 –	Petroleum Information, IHS Markit, Denver, CO
2002	UW Department of Geoscience–Distinguished Alumni Award
2011	AAPG–Honorary Member
2015	Colorado Oil and Gas (COGA)–Lifetime Achievement Award

My Proudest Accomplishments

It was my good fortune to build a 50+ year career as a petroleum geologist based on 110% effort with accountability, integrity, and respect for my employer, colleagues, and cus-

tomers. From years of focus on E&P databases and computer applications I am proud of two accomplishments: 1) The well and production databases that we developed at Petroleum Information during the 1960s still are the foundation for E&P databases used by leading U.S. companies. 2) The PPDM (Public Petroleum Data Model Association) data model, for which I served on the Board of Directors during a critical time during the 1990s, still flourishes as a global standard for E&P data. During my career, I also am proud to have shared insights on geological applications and evolving E&P trends and opportunities with thousands of geologists in more than 50 countries as a participant in the AAPG Continuing Education Program and as speaker/moderator of industry forums at AAPG APPEX, ACE, and ICE conferences, NAPE business conferences, and other worldwide industry events.

My Biggest Disappointment

Even though I am proud of accomplishments from involvement in petroleum databases and computer geology, I regret not investing in a second career as an exploration geologist. Wouldn't it have been fun to have a direct hand in a discovery based on one of the interesting trends and anomalies that we observed on computer-generated maps and analyses that were shared with others?

Anecdotal Story

A freezing rain struck during my morning newspaper route in Iowa City. After an hour,

my clothes and mittens were soaked and ice crusted. In tears, I abandoned the route and returned home to thaw out. I told my father that I was too miserable to continue but he insisted that I was obligated to complete my route. After changing clothes and with chattering teeth and freezing fingers I completed the route. The lessons learned served me well when facing challenging and uncertain times during my career.

In 1963, during my first year with Mobil Oil, I was asked to hand-post drillstem test results from hundreds of offset wells to a map of a large acreage trend. After a few days I decided there must be a better way and started to investigate how computers might do the job. This led to an assignment as an advisor to Petroleum Information's (PI) well database developments. Subsequently, I joined Jim Forgotson at PI to develop applications so that majors and independents could leverage the benefits of digital well and production histories.

Over the next decade, the US databases were in place, computer analytics and mapping services were humming, oil prices soared, and I yearned to resume a career in exploration. This desire was thwarted by the oil price collapse and economic crunch during the 1980s. But fortuitously, PI expanded internationally and acquired ERICO in the UK. The opportunity to collaborate with Paul McDaniel, John Shelton, and Peter Wigley in developing international geological studies and geological databases restored my geological zeal. Even in the face of adversity, opportunities arise that can revitalize your career. And, thankfully, the combination of PI/Dwights, Petroconsultants, and CERA under the IHS umbrella generated another career renaissance that persists today. For the past 15 years, I collaborated with Ken Chew, Bob Fryklund, and others on the IHS team to analyze game-changing industry trends ranging from the peak oil debate to the evolution of shale gas and tight oil plays.

Moreover, it was a pleasure and honor to be involved in continuing education throughout my career as speaker and moderator at industry forums, where we exchanged

insights on these trends and oil finding ideas with thousands of geologists. Keeping abreast of the rapidly evolving petroleum industry challenged my petroleum geology skills and at times felt like being involved in a continuous PhD thesis. Looking back, a multifaceted, service-oriented career that allowed me to share new tools, analytics, and insights with fellow geologists around the world has been incredibly fulfilling. How fortunate at age 80 to be actively involved with the incredible professionals in this fantastic petroleum industry. It seems like my career has just begun and I am still learning how to move from good to great under guidance from the IHS Markit Chairman, Gerri Stead.

My Advice to You

Hone your character/values along with geological and problem-solving skills and focus on your passions.

Acknowledgments

I am grateful for several outstanding mentors and managers who opened doors to shape my career, including: Dr. Lewis Cline and Dr. Stan Tyler at the University of Wisconsin; Owen Blexrud and Lou Castelli at Mobil Oil; the Goodin brothers at Petroleum Information; John Butler and Bob Hodgson at Gequest International; Rick Fritz at AAPG; and Scott Key and Gerri Stead at IHS Markit. Thanks also to the hundreds of IHS Markit and industry colleagues who make it a pleasure to come to work each day.

Dan Brent Steward



Career History

1967–1972	BS in Geology, Univ. of Houston
1972	Drilling fluids engineer, Dresser Industries, Magcobar
1974	Geologist, Shell Oil Co.
1981	District geologist, Mitchell Energy Corp.
2002	Consultant, Republic Energy, Dallas, TX
2007	AAPG Outstanding Explorer of the Year
2014	Advisor, INEOS

My Proudest Accomplishments

My biggest accomplishment as a geologist is twofold. First, being a part of George Mitchell's team to evaluate and establish a thermogenic shale as commercially viable, which has ultimately resulted in the United States becoming more energy self-sufficient and reducing our dependence on oil. Second, to be asked to write Mitchell's history in the Barnett play and having accomplished it to the satisfaction of George P. Mitchell. I have been honored with several awards during the last 10 years, which are gratifying and humbling, including the AAPG Outstanding Explorer of the Year 2007.

My Biggest Disappointment

My biggest disappointment as a geologist in the oil and gas industry is that we frequently fail to learn from past mistakes.

Anecdotal Story

In October 1981 I took a position with Mitchell Energy Corp. as a District Geologist for the North Texas area. My responsibilities required overseeing the drilling of Atoka wells, and beginning in 1982 working with exploration to select some of these wells to deepen, to build our knowledge of the Barnett Shale. Over time my position changed, as well as my areas of responsibilities. Whatever changes occurred, the Barnett Shale was one of my primary areas of responsibility.

The success of the Barnett Shale was proven through trial and error, accumulation, integration, and understanding the results of hundreds of wells. The repeating story of the Barnett was: be careful about believing what you think you know. George Mitchell persevered and proved all the naysayers wrong. I was blessed to be a part of Mitchell's Barnett team and look at the play's success as a gift from God. Not only for the timeliness of the crucial gas production but also for its critical role in the expansion of the shale revolution resulting from the knowledge, understanding and technological applications developed in the play. Mitchell Energy established the Barnett as the analog that would set the stage for many other resource play possibilities. When Devon merged with Mitchell in 2002 I joined Republic Energy in Dallas, Texas as a consultant to assist in the Barnett as well as the Marcellus Shale of Appalachia. I remain working with Republic Energy, and since 2014 have been involved with INEOS, the largest privately owned petrochemical company in the world, advising on potential UK shale projects.

The Barnett play had a 20-year life at Mitchell before the merger with Devon and the stories are many. There are two I felt compelled to share. First, in late 1996 Nick Steinsberger suggested using slick-water fracs on the Barnett Shale to reduce cost. The response from many in the company was tantamount to heresy. They did not understand that the Barnett in the area under develop-

ment did not have swelling clays. Most people in the industry have been taught not to put fresh water on shales and assume all shales are fresh-water sensitive. Nick's water fracs reduced cost, increased per well EURs, and made the Barnett commercial at spot gas prices. Second, in 1998 Mitchell hired Kent Bowker as our Barnett geologist after Chevron shut down their Barnett efforts in Johnson County, Texas. Kent looked at our data, including our gas-in-place numbers from a GRI-DOE study in the early 1990s. Based on his knowledge of the Johnson County gas-in-place volumes acquired from the one exploratory well Chevron drilled, he told us our numbers were wrong. In the 5 years that lapsed since our test and the Chevron test, many things were learned about evaluating gas in place. Our original number of 50 BCF per square mile and estimated 17% recovery efficiency were preventing infill drilling. The

new evaluation under Kent's supervision in 1998 came up with 150 BCF per square mile. This confirmed the need for much tighter well spacing and subsequently resulted in higher recovery efficiencies.

My Advice to You

My advice to you is to seek a job in geology that will fulfill your passion. Over the years, I have encountered professionals in all aspects of the oil and gas industry who were making good money but not happy in their job. Once you make a career choice, seek out mentors and expand your knowledge. Joining both local and national professional associations and societies within the industry you choose will provide a good source for networking and continuing education. A college degree proves you are capable of learning and willing to work hard with the skills acquired, but generally does not prepare you for the work place.

Richard K. Stoneburner



2013–2014 Senior Advisor, Pine Brook Partners

My Proudest Accomplishments

It was during my time at Petrohawk that I had the great fortune of leading a team of geologists, land men, and engineers who discovered the Eagle Ford Shale. We began the exploration process in January 2008, became confident enough with our geologic findings by April to begin putting together a leasehold position of approximately 165,000 acres, spud our first well in July, and completed that well in October for 7.6 MMcf/d and 251 bbl c/d in. We named it the Hawkville field. It was truly the “perfect storm” of an exploration process to be able to make such a significant discovery in such a short period of time, and it was a testimony to the hard work of the team and the aggressive nature of Petrohawk's management. Other wells had been drilled with the Eagle Ford as an objective prior to our discovery, but none had proven to be commercial prior to October 2008.

Career History

1972–1976	BS in Geology, Univ. of Texas–Austin
1976–1977	Geologist, Texas Oil and Gas
1981	MS in Geology, Wichita State University
1981–1985	Independent company owned by Floyd Wilson
1985–1996	Self-employed
1996–1998	Hugoton Energy
1998–2003	3TEC Energy/Plains Exploration
2003–2011	President COO, Petrohawk Energy

My Biggest Disappointment

My career as a petroleum geologist actually started from observing my father, Roger Stoneburner, throughout his illustrious career as an explorationist, which spanned from South Louisiana to the North Sea to Indonesia and many points in between. He was a fantastic role model, father, and mentor to me. I think the biggest disappointment in my career was that he was not alive to experience the success that I had while at Petrohawk, as he passed away in 2006. I would have loved to have shared it with him.

Anecdotal Story

Another great story that was integral to Petrohawk's success was the acquisition of what we called the Black Hawk area located in northern DeWitt County, which eventually was proven to be the most economical area of the entire Eagle Ford play. The acreage was owned jointly by Weber Energy and Geo-Southern Energy in late 2009. I was asked by the principals of the two companies to provide advice on how I thought they should complete their most recent Eagle Ford well because they had made a mess of the first well they had drilled and it had proven to be noncommercial. Ben Weber was the owner of Weber Energy and I had worked for Ben in the late 1980s during my period of self-employment.

After the meeting in late November when I offered the completion advice, I told Ben in a rather off-handed manner that if he ever wanted to sell his interest in the acreage block he simply needed to call. Three weeks later he actually called and asked if I wanted to come to his office in Dallas to take a look at the results of the completion. I quickly took him up on the offer and went to his office with three of my Petrohawk colleagues. It took less than 30 minutes of reviewing the data to become convinced that we needed to buy him out of his acreage position. I immediately went into his office and offered him \$3000/acre for his 50% interest in approximately 120,000 acres. He accepted the offer on the spot and that acreage turned out to be integral to our ability to merge with BHP 1 ½ years later for \$15 billion.

My Advice to You

My advice to anyone put in a position of making a major decision is that while you should not act on pure impulse, if the data support a level of conviction that causes you to be certain that the decision is a good one, then don't hold back for fear of failure. You may never get another chance to make a decision that was as impactful as the one I made in Dallas in late 2009.

Ione Lindley Taylor



Career History

1976	BS Chemistry, Guilford College	1985	Operations Geologist, Offshore Gulf of Mexico, Amoco Production Company
1978	MS Geology, University of North Carolina at Chapel Hill	1987	Regional Petrologist, New Orleans Region, Amoco
1985	PhD Geology, University of North Carolina at Chapel Hill	1989	Geotechnical Expert, Technical Services Group, Amoco, Houston
		1992	R&D Technology Director, Integrated Rock/Fluid Systems, Amoco Research Center, Tulsa
		1996	Manager, Strategic Regional Studies & VP for Amoco Overseas, Amoco Worldwide Exploration Business Group
		1998	Upstream Technology Group Lead, Worldwide Reservoir Description, BP Amoco
		1999	Science Center Director, Eastern Energy, US Geological Survey (USGS)

2008	Chief Scientist, Eastern Region, USGS
2010:	Associate Director, Energy and Minerals and Environmental Health, USGS
2014	Executive Director, Earth & Energy Resources Leadership Program, Queen's University, Ontario, Canada

My Proudest Accomplishment

I am certainly not a distinguished exploration pioneer and oilfield elephant hunter like many of those featured in the 1st volume of *Heritage of the Petroleum Geologist*. In my own way, however, I have been a different kind of pioneer facing other types of frontiers that include translating what I have learned forward across four major career leaps. I started as a trained chemist, my geologic path in hard rock, but by the time I finished grad school, the bottom had fallen out of the minerals industry. So, I recast my water-rock subsurface experience into “permeability prediction” skills and, fortunately, was hired by a major oil company during the 1980s downturn. After 15 years in the oil business, I moved to the US Federal government, working on national energy supply issues. After 15 years in public service, I decided to take what I and my colleagues had learned along the way (often the hard way and wishing we had learned much earlier in our careers), and build this into a new graduate degree program aimed at early-career professionals. So, I am coming back full circle into academics in a three-legged stool career model: industry-government-academia. Such leaps out of established comfort zones are not easy, but have sure broadened my perspective on our profession, made me scramble up steep learning curves, and allowed me to work with great new colleagues. I would never have been able to do this without the love, support, and flexibility of my husband, Al Taylor, our son and daughter, and families.

My Biggest Disappointment

Like many of my colleagues, my major disappointment has been the loss of important efforts, unique work environments, and dedicated teammates due to restructuring and downsizing of the industry, and furloughs due

to government shutdowns. Particularly poignant was my early 1990s excited arrival in Tulsa, OK (former “Oil Capital of the World”) at the Amoco Research Center, colloquially known as “The House that Frac Built” due to patents awarded for early work in this area to Stanolind, precursor of Amoco. Unfortunately, I arrived just at the end of a 50-year era. What occurred next was a period change that ultimately ended in the closure of that wonderful facility and dispersion of its world-class experts.

Anecdotal Story

I was a new hire at Amoco making my first well recommendation as an operations geologist for the offshore Gulf of Mexico shelf. I had agonized over every detail and squeezed all I could out of the limited available data. The play was an anticline on the downthrown side of a Tertiary-aged growth fault. The structure was there but was the hydrocarbon? In Committee, the exploration manager looked at me and said, “You’re the geologist, what do you think we should do?” I gulped and said, “I think we should drill it.” He then said, “The geologist says to drill it, so drill it.” Be careful what you ask for; either I was going to be proven right or wrong. Later, when the MWD log came in with that lovely resistivity kick, I was thrilled—my first discovery!

I went to work immediately preparing the well point-out for the next morning. I sailed into that meeting full of new pride as a proven “oil-finder” with the geologic story updated and estimates for net pay. Once I was done, a new engineer I had never met presented a preliminary development plan. I listened in disbelief as two six-slot platforms were proposed for an accumulation that I felt could easily be produced from one well. The engineer was followed by an economist who presented calculations for risk-weighted economics for the discovery, based on the engineer’s proposal. I stood there helplessly as my oil discovery dried up and blew away—burdened by such a development plan it was noncommercial—and a recommendation to plug and abandon. I didn’t agree with the recommendation, but was totally unprepared

and too inexperienced to present and defend another option. I found myself sputtering and extremely embarrassed that I had come up so short. I had failed to anticipate the next steps forward and when or how the engineering or economic aspects would play out.

I have never forgotten how clueless, out of my league, and rotten I felt and what I learned that day about zooming out to see the bigger picture of what you are working on and its interdisciplinary connections with other aspects of the business. In fact, this early lesson still stings and remains a major inspiration for my work today in helping early career professionals to have a less siloed, and much more integrated view of their work, avoiding some of the embarrassment that I felt.

My Advice to You

Engage with the next generation when you can. Over the last few years, I have been involved with the AAPG Visiting Geoscientist Program as a Coordinator and a Speaker. Yes, it is tough to face the millennials knowing that somewhere in a box on a shelf you still have your *Rubber Soul* album and yes, some never look up from monitoring their social media. But sometimes, some of them come up to you and ask, “How does the oil window open and close?” and “What do you do to stay on the critical path?” Then it’s worth the effort. I’ll end with a super piece of advice given to me years ago by the late, great geopressure expert, Dr. John S. Bradley, “Ione, remember that no matter how high tech you think you’ve become, the rocks can always bring you to your knees.” AMEN.

Acknowledgments

Special thanks to some of my favorite geologists: Chuck Chapin showed me in New Mexico what a geologist really does. Marybeth Donaldson and Laura Sarle believed in me and helped me get hired into Amoco. Laurel Babcock gave me my first management job at the Tulsa Research Center and Dick Larese taught me what I needed to know to succeed in it. The enthusiasm of Dave Russ and Dave Houseknecht for geology brought me into the US Geological Survey and Suzette Kimball,

Pat Leahy, and Marcia McNutt sponsored me into the Senior Executive Service of the US Federal Government. Jean Hutchinson warmly welcomed this American to a superb Canadian university. Two other geologists have been key supporters over the long haul. My husband, Al Taylor, sat down years ago at our kitchen table and showed this hard-rock geologist how to find that shale resistivity marker, pick fault cuts, and correlate logs. He remains my mainstay, along with our son and daughter and families. Jim Coleman has been a colleague, colerarer and coteacher through every stage of our careers. Finally, I am especially grateful for the changes that are making the oil business a more family-friendly workplace for everyone, and to Amoco specifically for providing an environment that allowed us working moms to stay in the workplace. Thanks to the joint effort of these female colleagues—geologists, geophysicists, engineers, and land men—Amoco Production Company became the first oil company ever to make the list of “The 100 Best Companies for Working Mothers” in 1997.

Scott Tinker



Career History

1982	BS in Geology, Trinity Univ.
1985	MS in Geological and Earth Sciences, Univ. of Michigan
1985	Champlin Petroleum
1996	PhD in Geological Sciences, Univ of Colorado–Boulder
1988	Marathon Research Center
2000–present	Director, Bureau of Economic Geology, Univ. of Texas–Austin

My Proudest Accomplishment

I believe that my proudest accomplishments are yet to come! My amazing wife and kids—the two older of whom are a geologist and a petroleum engineer, and two younger of whom are still in the process of discovering—give me the greatest pride. The relationships I maintain with family and friends provide a source of fulfillment. Mostly, I spend my time thinking forward and I believe this mindset has helped the Bureau be a leader in many important research areas. As such, my proudest professional accomplishment is the Bureau itself. *The Switch Energy Project* has been rewarding in ways I did not think possible. We are in more than 1000 universities and the film has been seen by more than 10,000,000 viewers—bringing industry, government, and academe together and potentially materially impacting those living in energy poverty. Finally, service to professional societies, like the AAPG and AASG, has provided me with lifelong friendships and molded my career in ways I could never have anticipated.

My Biggest Disappointment

Disappointment is usually for an opportunity missed, or the way I might have handled something differently, but I try not to dwell on disappointments as these are just experiences along the way. An area of discouragement is the lack of industry and government commitment to long-term research and the closing of many research labs. There is no shortage of hydrocarbons; research is vital. An area of concern remains the intense negative passion regarding carbon-based energy, the lack of public understanding of the tight relationship between energy and poverty, and the inevitable political machinations that result. But it just makes me roll up my sleeves and work harder.

Anecdotal Story

A life well lived is a collection of anecdotes, and they all have wonderful lessons to teach. Most are best shared over beer...like the time I used the tinted windows of Bob Sneider's office as a light table for Exacto knife splicing; or the time an agave spine broke off in my leg and squirted out two months later; or the rattlesnake bite on 9/11 on a remote section of the Pecos River; or...

My Advice to You

Say yes. Associate with smart people filled with integrity. Work harder than you think you can. Focus on solving rather than criticizing. Don't believe everything you think. Look at rocks. Live large. Laugh often.

Victor Vega



Career History

Born 1964

1989	BS Geology, Universidad Nacional de Colombia
1993	MS Geophysics, University of South Carolina
1993	Amoco Production Company
1999	BP plc
2011	Talisman Energy
2015	Shell

My Proudest Accomplishments

My proudest accomplishment has been having the opportunity to work for international companies like BP and Shell and to hold key management positions, including projects in Canada, Colombia, USA and Venezuela. With the AAPG, my proudest accomplishment has been working with other leaders in the region and contributing to the significant growth of the Latin America and Caribbean regions. This includes forming and reactivating 27 student chapters, six Young Professional Chapters, organizing International Conference and Exhibition events in Cartagena and Cancun, and hosting successful Geoscience Technology Workshops in five countries.

My Biggest Disappointment

My biggest disappointment was not finding commercial gas in a prospect drilled in offshore Colombia. We spent a couple of years preparing to drill and had to overcome many problems, including obtaining an environmental license, dealing with local communities

and facing intense pressure to succeed. This experience was especially difficult because of the high expectations that people in the company and industry had for the well and the fact that I had been involved in exploration efforts in this part of the world since 1998 with Amoco, BP, and Talisman. The experience left a profound long-term effect on me throughout my career by preparing me to deal with expectations and unexpected results.

Anecdotal Story

Professional: While working for BP in the Jonah/Pinedale Anticline team, I started traveling to Denver and attended a meeting of the Rocky Mountain Association where there was a presentation about basin-centered gas. We went back to the office and had a lot of discussion because we couldn't make sense of the concept. This was my first real exposure to trying to be open-minded about new concepts, even when they seemed to make no sense.

Personal: I was in transition during the BP-Amoco merger and an earthquake occurred in Armenia, Colombia. I was able to take a leading role coordinating relief efforts, which included working with people from Houston, Dallas, and San Antonio. As part of this effort we were able to send several containers with food, clothes, and other items and to rebuild a school that was severely damaged. Focusing on this effort helped me tremendously during the transition to the new company, particularly after having lost several friends who were part of the Amoco exploration team and left the company as part of the merger.

My Advice to You

Given the amount of uncertainty and volatility in our industry, I would like to encourage the younger generations to be persistent and proactive in managing their career. Always take the initiative in everything you do, and dream big. Stay connected by building a professional network that is going to help you during difficult times and that is going to provide you with significant opportunities to

meet other people and to learn about other cultures. Learn from your mistakes, and think

about the mark you want to leave and how you would like to be remembered.

Paul Weimer



Career History

1978	BA in Geology, Pomona College
1980	MS in Geology, Univ. of Colorado–Boulder
1980–1984	Exploration Geologist, Sohio Petroleum, North Alaska
1989	PhD in Geology, Univ. of Texas–Austin
1988–1990	Mobil Research & International Exploration
1990–present	Professor and Geological Consultant, Univ. of Colorado–Boulder

My Proudest Accomplishment

That is simple—having the privilege to work with so many outstanding people, both within and outside the university. I have published papers with more than 150 authors, which means I collaborated with a lot of people. I have been fortunate to teach short courses in 35 countries, and consult in an additional 10. Most of the projects have been on deep-water exploration. I had a tremendous amount of help along the way in my career, so I always try to give back 10 times as much.

My Biggest Disappointment

As I age, that is a difficult concept, because much to what I initially responded as a disappointment later turned out to be a blessing in disguise. Several things in my career for which my initial response was disappoint-

ment, later transformed into seeing a greater picture. A few disappointments became cul-de-sacs, but many ended up becoming transformative experiences. Perhaps the most informative disappointment early in my career was the dry hole at Mukluk. There was plenty of hubris regarding it being a “sure thing” and would replace Prudhoe Bay reserves. We discovered petroleum systems were a lot more complicated than what we originally considered.

Anecdotal Story

I still remember the week in August 1978 when I realized that I could succeed as a geologist. While on a series of field trips, my brain connected 3D and 4D thinking, and I could feel things click into place. It was only many years later that I realized that few people have the gift of thinking this way.

My Advice to You

In 2004, when I gave the SEG Distinguished Instructor Short Course, I provided the following answer for *The Leading Edge*:

- Be sure you're 110% in love with this profession, because it is extremely rewarding but it has a LOT of bumpy rides along the way.
- Plan your career as if you are going to be a consultant one day. This means stay current with the evolving geoscience concepts and technology, and make a major effort to get to know your colleagues in other companies and in the geo-community. Joining professional societies will help considerably. The development of the unconventional resources during the past 10 years has probably doubled our geo-database for young geologists to learn.
- Be aware that our industry operates in 2- to 3-year cycles. You're going to have to live through them so plan accordingly. On

a personal note, do not accrue any unnecessary debt.

- Be mindful that your interests will change throughout your career, sometimes quite significantly. Be aware of that and follow where your heart leads you.

- This new point was related by a former student: approach every partner meeting as if it is an interview. That's pretty insightful.

William A. Zagorski



Career History

Born 1957, Pittsburgh, PA

1980	BS Geology, University of Pittsburgh, PA
1980	Geologist/Chief Geologist, Atlas Energy Group, Inc
1982	Exploration Manager/Chief Geologist, Mark Resources Corporation
1992	MS Geology, University of Pittsburgh
1993	Sr. Geologist/Manager of Geology, Lomak Petroleum, Inc
1997	Vice President, Geology, Great Lakes Energy Partners
2003	Vice President, Geology & Chief Geologist, Range Resources Corporation
2009	Formally recognized as the "Father of the Marcellus" by the Pittsburgh Association of Petroleum Geologists (PAPG)
2010	Received AAPG Eastern Section's Presidential Award and Pittsburgh Business Times' Energy Leadership Award
2013	Recipient of the AAPG Norman H. Foster Outstanding Explorer Award presented at the AAPG 2013 ACE Meeting held in Pittsburgh, PA

My Proudest Accomplishments

- Being a pioneer and active participant in the discovery and development of the world-class reserves from the Marcellus Shale in the Appalachian Basin, driving what has become the second largest gas field in the world
- Leading the technical teams that drilled and completed the first horizontal discoveries in the Utica Point Pleasant play and Geneseo Burket shale plays in 2010 in the Appalachian Basin
- Successfully applying John Master's concepts of basin-center trapping in Western Canada to the huge Clinton/Medina play in Ohio and Pennsylvania
- Inspiring and mentoring many geologists to have successful discoveries and careers of their own
- Publishing and presenting through AAPG and other professional societies and research consortiums.

My Biggest Disappointment

I have had several disappointments. However, many of these taught important lessons that led to greater understanding and, later, greater successes. These include:

- My early unsuccessful attempts to commercialize the Devonian Shale play in Ohio and Pennsylvania
- Attempts to commercialize the Silurian Lockport Dolomites Trenton Black River plays in Pennsylvania; however, these provided key learnings to make future discoveries
- Not being able to expand on successes I had early in my career in the Bluebell Altamont play in Utah and later in the

shallow overpressured Trenton play in New York

- The original Renz Unit well deep target tests in Washington County, Pennsylvania.

Anecdotal Story

The one story that stands out is the drilling of the Renz Unit #1 well and the initial commercialization of the Marcellus Shale play in 2004. It's a geologic phoenix story. Originally planned as a deeper test of the Silurian Lockport interval, despite high hopes based on the size of the structure and quality of the shows, it just seemed that commercializing zones below the Marcellus was out of reach or perhaps never meant to be. After travelling to Texas to review a Floyd shale prospect with my friend Gary Kornegay, I had the Marcellus eureka moment after seeing the Barnett Shale analogs driving this Black Warrior Basin play, and compared it to the Devonian Shale studies and Marcellus gas shows in the Appalachian Basin. Despite the failures in the Renz wellbore I was so excited about the potential of the Marcellus when seen through Barnett eyes (so to speak). After convincing Range's CEO Jeff Ventura to champion the play (with lots of help) and support testing it, the rest is now history and the play is producing over 18 BCFEPD in 2016 with decades of growth left in it. It's a big story with lots of key players, but out of early failure rose one of our industry's biggest discoveries.

My Advice to You

Know what you don't know. It's what you don't know but what you ask that leads to major breakthroughs. A curious mind is critical, as is desire and passion. Challenge conventional wisdom as you are trying to find new oil and gas, not explain what has already been found. Appreciate scale in everything, from regional mapping to the pore level. Integration and use of multiple approaches and technologies are both very important. Use analogs to support and justify your hunches. Persistence is a huge key. Don't let fear of failure stop you from taking risks—that is the explorationist's job, as anyone can say no. Being a visionary can be a lonely job espe-

cially at first. Embrace a long-term viewpoint to your ideas and concepts. Ideas take time to develop and test. Know that many lessons learned now can potentially lead to future discoveries.

Acknowledgments

It has been an amazing blessing to participate in the renaissance of our petroleum industry and be honored for the role I shared in the early commercialization of the Marcellus shale. My gratitude goes out to family, friends, and leaders who inspired me, dedicated and enthusiastic coworkers, and the many mentors and advisors who provided vision and support. I thank my father Valentine A. Zagorski, for cultivating my love of geology and science. Early geology influences include Norman Flint, John Grego, Tom Anderson, Chris Laughrey, John Masters, Dan Busch, Mike Carlson, Bob Ryder, John Harper, Sam Pees, Dick Beardsley, and many others I wish I could thank individually here.

Many inspired me greatly leading to and after the shale revolution. My gratitude and thanks go to Jeff Ventura, Ray Walker, and John Applegath for their brilliant leadership, vision and support. Thanks goes to Jim Funk, Mike Forrest, Doug Bowman, Gary Kornegay, Greg Wrightstone, Jim Morris, Martin Emery, John Martin, and so many others. My love and thanks to my wife Stephanie and our sons for all of their love and support. I finally wish to thank AAPG for this great honor. My sincere thanks go to AAPG Past Presidents Ted Beaumont and Paul Weimer and incoming AAPG President Charles Sternbach for your support and encouragement.

Postscript

Charles A. Sternbach



Career History

Born 1957 in Queens, New York

1975	Graduate of Stuyvesant High School, Manhattan, NY
1980	BA Geology, Columbia University, Manhattan, NY
1984	PhD Rensselaer Polytechnic Institute, Troy, NY
1984–1997	Staff Geologist, Shell Western Exploration and Production, Houston, TX
1997–2004	Exploration Manager, JOG Corp, Tom Jordan Exploration, Houston, TX
2004–2014	President First Place Energy, Houston, TX (International and Frontier Exploration)
2004–present	President Star Creek Energy, Houston, TX
2014–2015	President, AAPG Division of Professional Affairs (DPA)
2016–2017	President-Elect, AAPG

My Proudest Accomplishments

In April 1997, I attended an AAPG event in Dallas that changed my life. The “Legendary Tale” round-table panel (organized by Jim Gibbs) featured: Tom Jordan (my future employer) and other industry legends who explained life philosophies and how they succeeded in the business of exploration. I sat in the front row, took 10 pages of notes, and wondered: “why aren’t there more programs like this?”

I am proud of fellow geoscientists who supported my efforts to organize motivational programs over the last 20 years. Members of the Houston Geological Society (HGS), AAPG, and DPA elected me to leadership roles. I used these positions to create, organize, and moderate HGS Legends Programs, AAPG Discovery Thinking Forums, and DPA Playmaker Forums. I thank the thousands of geoscientists who have attended these programs. Viewings on the AAPG and HGS websites number in the tens of thousands. Thanks to fellow organizers, these programs continue to grow and thrive. I am particularly proud of organizing 18 Discovery Thinking Forums at AAPG ACE and ICE meetings and the 115 men and women speakers (and coauthors) who fulfilled a decade-long promise to recognize “the one hundred who made a difference” for the AAPG 100th Anniversary Centennial. It has been a great privilege to know these amazing men and women, and to see many of them participate in this publication. <http://www.searchanddiscovery.com/specialcollections/discoverythinking.html>

I am also proud of friendships made on the journey. One of these was Michel T. Halbouty. I remember organizing the HGS 2003 Legends Program and asking Mike to speak. MTH: “Sorry Charles, I have an important business meeting in NYC on that date. No can do.” Me, imploringly: “Mike, this is right up your alley. We really need you.” Drawing a deep breath, then sighing, Mike said: “Who else you got?” Me: “Bill found 15 TCF gas in the Rockies. Marvin drilled 10,000 wells. Tom found a 100-MMBO oilfield while he was a graduate student.” Halbouty said (grinning broadly): “Oh, those guys are alright, but you need a real wildcatter!” Then he yelled to his executive assistant: “Mary, get New York on the line!”

We became close friends for 7 years. The 2003 Legends Program above was Mike’s last

major public appearance. Near the end, I visited Mike in the hospital. He asked me to speak at his funeral. I was dumbfounded. He would not let go of my hand until I said yes. I will never forget when the call came. At the funeral, I told a story. "Mike, we know you are in Heaven. By now you have gotten hold of St Peter's maps of all the undiscovered oil and gas fields in the world. Please remember your friends down here who still struggle and send us some clues!" Former President George H.W. Bush, was in the audience.

My Biggest Disappointments

An exploration journey often requires revisiting old areas with new information, technology, concepts, or economic conditions. A study of Wilburton field in the Arkoma Basin led me to understand seal and source rock parameters that created a 400 BCF gas field in Arbuckle carbonate reservoirs. Further analysis led me to a Texas Hill country area that possessed good fundamentals but no significant production. One of my early wildcat attempts involved drilling a large structure 100 miles from the Ellenburger production outside of the Permian Basin. It was a low budget operation. Our analog was Todd Oil Field (43 MMBO). Unfortunately, the well had mechanical problems with gas shows and was "junked" at the top of the Ellenburger.

Marlan Downey explains that Phase 1 explorers are that rare breed who open a new play or basin. While some explorers are happy to drill the 50th discovery in a producing trend, I wanted something more. Drilling basement tests on large structures in a non-producing basin, I realized I needed a "Phase 1" operator, someone who knew the thrill of that kind of victory. Doing the impossible was nothing new to Bob Gunn. When Bob and a talented team joined my quest, I knew we had the fortitude needed to drill large structures all the way to basement.

Eureka! We discovered a dry gas field in the Ellenburger. The enigma was that we were surrounded by Barnett Shale source rocks squarely in the peak oil window. Why were we producing dry gas and little oil? An AAPG paper cited one option as the "Squeeze

effect." The Ouachita overthrust discharged hot gas and fluids flushing underlying oil out of large structures in the oil window. Horizontal drilling, a transformative technology in karsted, "tight" Ellenburger reservoirs, remains an option to revisit our discovery. There are oil prospects away from leading-edge thrust sheets. So, twice denied, I guess I am still not ready to give up!

Anecdotal Story

I have had the good fortune to work as staff geologist for a multinational company at Shell with training and experience on world-class teams and data sets. I have worked with Tom Jordan, a legendary explorer, as an independent exploration manager. My dream to own my own company came alive in 2004. I have gained a lot from role adaptations, what some have called "paradigm shifts."

The pros of owning your own company: you are your own boss, you choose your projects and partners, and you have real skin in the game. The cons? Bills come in and they have your name on them. As I began my new company Star Creek, I wondered how I was going to keep the dream alive. Initially, the bill pile was high and things looked grim. The phone rang. A former car pool buddy said: "Hi, I just joined a new company. We are looking for exploration projects with running room. Know of anything?"

Fortunately, I did. A geophysical colleague and I leased prospects in Michigan with seismic attributes that we felt indicated gas-filled porosity in a strata-bound hydrothermal dolomite. On Easter Sunday 2005, I got the call that we had made a roaring discovery. That day we were on the right side of the signal/noise coin toss. Early success enabled Star Creek to survive. Looking back, we found the best well in the entire play. Then, 2 months ago, I got another call telling me they found new reserves to complete. Our Michigan field continues to grow and evolve.

My Advice to You

Identify key things that make critical differences and do them well. Some of the best innovations I have made came from "lateral

thinking” or associating analogs in new ways or places. Walk around and observe. Learn from experienced explorers. Education never ends. Shake new hands and attend AAPG and local society events regularly. Raise your hand at meetings. Ask questions like “why not?” Try many shots on goal.

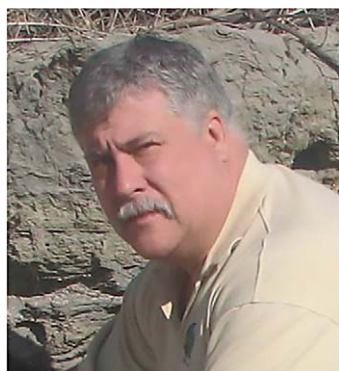
No one is poor who has friends. If you are given a spotlight, shine it on the good works of others. Help other people celebrate their moments. I have tried to do this by providing forums and publications for people to tell of *their* success, *their* discoveries, *their* proudest

and happiest of times. Their gift in return enables us to share in their glory, and perhaps to inspire us to our own great moments. That is what books like this are about.

Acknowledgments

Linda Sternbach, Tom Jordan, Norman Rowlinson, Gary Griffith, Bob Gunn, Marlan Downey, Jim Gibbs, Mark Hanson, Ron Snyder, Ted Beaumont, Larry Jones, Sigmund J. Rosenfeld, Deborah K. Sacrey, and many others.

Robert C. Shoup



Career History

Born 1955 in Winona, Minnesota

1978	BA degree in Geology, Winona State University
1980	MS degree in Geology, University of Oklahoma
1980	Shell Oil Company, New Orleans and Houston
1994	Shell China Petroleum Company, Beijing
1996	Shell Deepwater Inc., New Orleans
1999	Samson Offshore Company, Houston
2002	Hilcorp Energy Company, Houston
2004	Director, Clastic Reservoir Systems
2009	Instructor, Subsurface Consultants & Associates
2016	Chief Geologist, Subsurface Consultants & Associates

My Proudest Accomplishments

Since some of my proudest accomplishments were highlighted in the first edition of *The*

Heritage of the Petroleum Geologist (2002), I will focus on my proudest achievements in the last few years. On a professional note, my proudest accomplishment has been to become an instructor for the Subsurface Consultants & Associates (CSA) signature class Applied Subsurface Geological Mapping. This class, more than any other industry short course, teaches the interpretation, mapping methods, and techniques needed to help avoid drilling dry holes. Watching the expression of a student—young or old—who suddenly realizes the significance of a new method or technique, is priceless.

On a personal basis, my proudest accomplishment has been becoming a grandfather. Admittedly, I had little to do with that accomplishment, but I am able to serve as a role model for a precious little girl, a role that gives new joy and meaning to my life.

My Biggest Disappointments

My biggest disappointments were getting laid off/made redundant. Although getting laid off was not really in my control, it is disappointing nevertheless. However, in both cases when I was laid off, I ended up in better and more fulfilling positions.

Anecdotal Story

In the first edition of *The Heritage of the Petroleum Geologist*, I related a story of how one of my key mentors, Blair Parrot, helped me to find sharks teeth in an outcrop. This

story is also about Blair. In my first week at Shell, Blair walked into my office and put several folders on my drafting table (the 1980's version of a workstation) and told me to review these leads and see if any should be nominated for the next Gulf of Mexico lease sale.

At the time, I did not know what a lead was, and although I had a good idea of what a lease sale was, I did not know what a nomination was. I reviewed the contents of the folders, maps, logs and a few seismic lines, but I had no real idea of what to do with them. After panicking for an hour or so, I swallowed my pride and asked one of my team mates what leads and nominations were, and what was I supposed to do with the folders that had been dumped on my drafting table.

This was before the days of the open lease sales. My team mate explained that companies had to recommend, or nominate, blocks to the Minerals Management Survey (now BOEM) to be included in the next lease sale. The leads were potential prospects that had been recognized but not fully evaluated. My job was to evaluate the lead and see if it could be prospective. Whereas that seems simple and straightforward in hindsight, it was perplexing to a new hire fresh out of school.

With the help of my mentors, I learned how to evaluate a lead and prospect, and I was quickly off and running. One of those leads became my first discovery. The lesson learned is to seek out your mentors and ask for help when you need it. You are not expected to know everything, especially early in your career.

My Advice to You

Whether you work for a large company, or yourself, you should always consider yourself an independent contractor. You are the only individual who puts your career first and foremost.

Ours is a cyclic industry, one where layoffs are common. When you find yourself laid off, your job is to work hard to get the next position. It is often discouraging, especially when there are many applicants and few jobs, but

dedicate several hours of each day to finding the next position. I recommend you get AAPG's Division of Professional Affairs publication *Becoming an Independent*. It is an excellent career guide.

Acknowledgments

I am very truly grateful to many people, more than can be named in the space of this publication. But several significantly influenced my career and bear mention: Two professors, Dr. John Donovan and Dr. John Wickham infused me with a passion for geology. Blair Parrot and Billy Frank taught me how to evaluate and map prospects, and Dan Tearpock helped me bring those skills to a whole new level. Most significantly, I am grateful to my father who taught me by way of example that professionalism and ethics are a way of life, and that you get out of your profession only what you put into it.

Chandler T. Wilhelm



Career History

1979	BA Geology, Pomona College
1983	MS Geological Sciences, University of Colorado
1997	Certificate of Completion, University of Texas Global Finance Program
1981	Geologist, AGAT Consultants, Denver Colorado
1983	Geologist, International New Ventures, Pecten International Company (Shell subsidiary)
1989	Geologist, Texas Gulf Coast Exploration, Shell Exploration and Production Co.
1995	Business Planning Coordinator, Shell U.S.
1997	Exploration Team Leader, Deepwater Gulf of Mexico, Shell U.S.
1999	Exploration Team Leader, Deepwater Niger Delta, Royal Dutch Shell
2000	Global Deepwater Subsurface Evaluation Manager, Royal Dutch Shell
2003	New Ventures Manager, Americas Division, Royal Dutch Shell
2005	Alaska Exploration Manager, Royal Dutch Shell
2009	U.S. Onshore Exploration Manager, Royal Dutch Shell
2012	Vice President, Emerging Basins, Unconventionals Business Unit, Royal Dutch Shell
2016–17	President, AAPG Division of Professional Affairs (DPA)

My Proudest Accomplishments

As I look back, a few accomplishments—both professional and personal—stand out as those

of which I am most proud. On the professional side, I will always be indebted to managers who took a chance on me and placed me in positions that gave me significant responsibility. Two stand out in particular.

First, in 2000, Rich Sears gave me the opportunity to direct Shell's Global Deepwater exploration and appraisal evaluation program. At the time, Shell had a large, diverse, and immature portfolio, and was faced with the challenge of bringing evaluation consistency, rigor, and best practices to enable the portfolio to be managed as a unified business. This portfolio ultimately yielded several commercial discoveries that have helped underpin Shell's Deepwater business, including fields such as Bonga, Erha, Angola Block 18, Brazil BC-10, and the Perdido Fold Belt in the Gulf of Mexico. I had the rewarding experience of managing highly competent technical staff from more than 30 countries, and I learned much about not only what makes Deepwater projects succeed and fail, but also how to work with a highly diverse work force with very different backgrounds and experiences.

Many years later, in 2012, Dave Lawrence offered me the challenge of directing the derisking of an enormous and technically immature Unconventionals portfolio in the Americas. Shell was a latecomer to the Unconventionals revolution, and missed out on the prime sweet spots in the top early Unconventional plays such as the Bakken, Eagle Ford, and Barnett. However, with significant effort, an organic leasehold of ~10 million acres comprising ~30 emerging plays in five countries was built between 2010–12. Derisking a portfolio of this size and diversity had both successes and failures, but it eventually yielded the results that underpin Shell's current Unconventionals business. The five plays that comprise most of the value of the ~12 BBOE of resources that Shell has publicly disclosed (Duvernay and Montney in Canada, Wolfcamp and Utica in the U.S., and Vaca Muerta in Argentina) were discovered and appraised mainly during this period. Working in the Unconventionals business required

that I “unlearn” much about what made the Deepwater program successful, and so we developed fit-for-purpose evaluation workflows and project management paradigms uniquely suited for Unconventionals. I was also forced to deepen my understanding of financial management, because at the end of the day an Unconventionals project is judged on its financial performance, and it is not enough to deliver “technical resources” that don’t make money. Given the vast scope of the resources and the enormous pace of learning I personally think that this business will be a mainstay of our industry for the rest of the century.

Most importantly, however, during my 36 years as a geologist I have always had the good fortune to work with highly competent, motivated, and interesting people. Some of my proudest accomplishments are not of wells drilled or discoveries made, but rather have been to place talented individuals into challenging assignments and give them the coaching and support they needed to deliver superior business results. My fondest memories will be the faces of the many wonderful colleagues that I have known.

My Biggest Disappointments

If a geoscientist has never had a disappointment over the course of a career, then in my opinion it is likely that he or she has never really taken a big risk. I do not think that it is possible to push the boundaries of our profession by always playing it safe. Accordingly, I have had some major disappointments during my 36 years, and all caused me to have to face failure and ask myself the hard question of what I should have done differently to get a different result. I will describe two that have caused me the most reflection.

The first disappointment was Shell’s highly publicized failure in Alaska. I led the building of the exploration portfolio between 2005–08, during which we acquired the first industry streamer 3D seismic in U.S. arctic waters and leased a diversified exploration portfolio consisting of three distinct plays, including several under-appraised legacy discoveries. The strategy was premised on get-

ting one or more of these legacy discoveries to production to establish the infrastructure necessary to unlock the basin. But a hostile regulatory and stakeholder environment caused enormous cost increases and schedule delays, and led to a decision to drill only a single prospect (albeit really big) rather than fully test the portfolio. The result was “gambler’s ruin” and a large financial loss. Alaska was my first experience working in a really hard regulatory and stakeholder environment. The “above ground” challenges were, in retrospect, as big as the subsurface risks for the venture, and a better approach might have been to start small and demonstrate the ability to successfully navigate the regulatory maze and execute a drilling campaign before growing the portfolio. The paradigm of “profitability before materiality” has since proven to be valuable in managing risk in our Unconventionals business.

The second disappointment was an Unconventionals project in the heart of the Eagle Ford gas condensate window in south Texas in which Shell purchased a single lease of 106,000 acres that lacked any modern seismic or wells. A very high bonus was paid for this acreage, but it was a fair and competitive price at the time, and we narrowly won the bid against some tough competition. We shot contiguous 3D seismic, built early evacuation infrastructure, and brought 12 wells to production during the initial 15-month exploration campaign. The initial drilling results provided some reservoir surprises, but enough of the acreage remained prospective to move the project to development. However, with more production the early type curve modeling did not hold up, and a decision was taken to sell the project at a material loss. From this experience I learned about the limitations of model-based evaluations in Unconventionals, particularly in multiphase liquids reservoirs. The outcome also further reinforced the merits of a more phased approach to project risk management. But that is not the end of the story. The project now produces ~50 KBOE/d from a small operator, and well costs have been reduced far below expectations when the decision to sell was taken. So, the aftermath

has also yielded lessons on the potential for continuous improvement in Unconventionals and the need to reassess the key technical and operating parameters throughout the life cycle, even in “mature” development.

Anecdotal Story

I love the science of petroleum geology, and have always applied a very technical approach to my work. I strive to remain curious about the technical details that underpin our project assumptions, because I have learned that small details can make the difference between success and failure. So it may be a surprise to learn that my chosen anecdote is from my experience working in finance. I spent 2 years in an assignment during which I directed the business planning for Shell U.S. I was completely unqualified for the job when it was offered, but I trusted the judgment of my supervisors and accepted the offer. It turned out to be one of my most valuable professional experiences, because it taught me how the external world looks at our business as an investment. This perspective has helped me to have the confidence to challenge the numbers people because I know that they cannot snow me with obscure accounting rules or complex valuation methodologies. It

has also enabled me to better formulate the value proposition for an opportunity so that it can complete as an investment and not just as a good technical project. So for a geologist the 2 years spent in finance completely changed my career.

My Advice to You

First and foremost, do something that you love. Life is too short to spend your days enduring something that does not motivate you to do your very best. Second, be receptive to the talents that others see in you that you may not see in yourself, and recognize the value that breadth may bring to your career. Third, recognize that most achievements in our industry are really made by teams rather than individuals. Learn to work effectively with others, which means knowing how to step up and take initiative when needed, but also when to listen and allow others to take the lead. Finally, be accountable, which means delivering on your promises, and learning from your failures as well as accepting credit for your successes. Petroleum geoscience is one of the world’s great professions, and I firmly believe that it offers a rewarding and enjoyable life for those who navigate its inevitable up and down cycles.

Andrea S. Reynolds



Career History

1996	BA Geological Sciences, State University of New York at Geneseo
1998	Exploration Geologist, Gulf of Mexico–Amerada Hess, Houston
1999	MS Geology, Texas A&M University
2000	Development Geologist, Williston Basin–Amerada Hess, Houston, TX

2002	Geologist, Deepwater Brazil–Shell International, Houston, TX
2007–2010	Regional Exploration Portfolio Advisor, Americas–Shell E&P, Houston, TX
2007–2008	Lease Sale Coordinator, Alaska Sale 193–Shell E&P, Houston, TX
2010	Exploration Team Lead, Bossier Shale–Shell E&P, Houston, TX
2011	Staff Geologist, Appalachian Basin–Shell E&P, Pittsburgh, PA
2012–2013	President, AAPG Energy Minerals Division (EMD)
2013	Exploration Manager, Appalachia–Royal Dutch Shell, Pittsburgh, PA
2014	Technical Manager, Appalachia–Royal Dutch Shell, Pittsburgh, PA/Houston, TX

My Proudest Accomplishment

I’ve worked projects and prospects that pushed technical limits, giving me satisfac-

tion and enjoyment. Some of these include finding new Mississippian reserves in the Williston Basin by drilling horizontally out of old vertical wells in 1999–2000; the shift from the Campos Basin to the prolific presalt of the Santos Basin in the early- to mid-2000s; and working unconventional plays in the Haynesville and Appalachian Basin. My proudest professional accomplishment has been working on the team that discovered the Utica dry gas play in northeastern Pennsylvania, presented at the 2015 AAPG Discovery Thinking session. A new interpretation of the Utica and top Trenton on logs initiated a reworking of the regional interpretation from Ohio to Tioga County, PA, which validated the presence of the Utica/Point Pleasant in northeastern Pennsylvania. The project garnered management approval and funding, enabling the Gee 832 discovery, Neal follow-up well, and subsequent derisking and development wells, unlocking a multi-TCF gas resource with competitive break-even price.

This success is also personally gratifying, as I am from the Devonian of western NY state, and the formations we have drilled are the same shales that I studied during my formative undergraduate years.

My Biggest Disappointment

As an explorer, I've had my share of disappointing prospects and step-outs, either sub-economic "technical successes" or dry holes. This includes an early wildcat in the Gulf of Mexico, prospects in Block BC-2 in the Campos Basin, and testing the limits of shale plays—yes, it is possible to drill a "dry hole" in shales. Another big disappointment was Shell's Alaska well, detailed in Chandler Wilhelm's remarks. I heard the news regarding that specific well on the radio as I drove to work in Pittsburgh 8 years after I was lease sale coordinator for the Chukchi project. Each disappointment has prompted thought and reflection on what was observed and what I could have done differently or seen earlier in my role either as geologist, team lead, or technical manager, and what learnings I can incorporate going forward. I've learned that seismic is not a sure bet, no matter how good a potential "flat spot" looks predrill; migration

pathways are often simple, not complex; and shales are really about the rock properties and quality, such that the completion is secondary to the geology. The commonality between these learnings is that I continue to grow with each new basin and play, each pad, each well. If our job was easy and without risk, there would be a lot more geoscientists in this world! Without disappointments, our successes wouldn't be as appreciated, as meaningful, or as rewarding.

Anecdotal Story

I have learned that I find personal satisfaction in understanding geology, but that it would not be enjoyable without the people and connections that I have made throughout my career to date. In reflecting on the theme, "Heritage of the Petroleum Geologist," I realize that I have been extremely fortunate for the chance circumstances, opportunities, and great friendships forged over my nearly 20 years in this industry.

I recall a field trip to Spindletop in 1997, while I was a student at Texas A&M. On that trip I was seated cater-corner to Charles Sternbach. In a casual conversation regarding my thesis work, I found that, surprisingly, he not only knew my Master's thesis field area (Swimming Woman Canyon, MT), but that he had been there and, as a carbonate geologist, he regarded it as quite special. This was amazing to me, as outside of my advisor Dr. Wayne Ahr, I had met few people interested in Waulsortian-type mud mounds! This encounter taught me that the world is smaller than I had thought, and what may appear to be chance encounters may really be more than just chance. On that same trip, I had the pleasure to be introduced to Mr. Michel Halbouty, the name-sake of the geological building on Texas A&M's campus, the man who shook my hand as I crossed the graduation stage, and of course, one of the world's legendary wildcat-ers.

This meeting was fortuitous, as a few years later in 1999, now a newly minted and gainfully employed geologist, I cofounded the Houston Geological Society Neo-Geos to bring young professionals together, and fill a void—

this was after the 1980s bust and 1990s when few new folks were attracted to our industry. I envisioned technical talks geared toward our demographic, and I contemplated that the first speaker should be someone inspiring and from whom we could learn a lot. When Mr. Halbouty accepted the invitation to speak to our group I was ecstatic. His talk was electrifying, and I remember him sharing his deep belief in exploring in Alaska to find oil. You could hear a pin drop! At one point, during a dramatic pause, he leaned forward over the podium, and exclaimed in his distinctive accent, “I Did It...” and again, louder this time, “I Did It—I went where everyone told me I was going to fail, but I did it—I found hydrocarbons in Alaska.” This was, of course, before Alaska was a state in the Union. The story moved me and taught me that it is the unwavering belief in an idea, the gumption to follow your instincts, and the doggedness to take big risks that makes up the core of a true explorer.

My Advice to You

- Carve out time to think, feed your curiosity, and seek to find out what you don't know. Remember that what got you where you are today may at some point no longer work. Times, technology, ideas, and roles change. Stay current and keep learning.
- Understand the “big picture,” but do ponder details—both are important in making breakthroughs, sparking new interpretations and ways of working that may unlock cost improvements, better EUR efficiencies, or the next big discovery.
- Seek out new challenges and stretch outside your comfort zone. Learning from failures can fuel creativity, passion, and perseverance. Taking a risk is often needed to realize your true potential.
- Be open to advice, feedback, and constructive opinions. Feedback is a gift, and allows the opportunity to understand others' perceptions and identify opportunities for improvement.
- Place value in connections—networking is important, especially camaraderie among geoscientists. We each have a story to tell, and inspiration often strikes where paper napkins are plentiful.
- If you are able, give back to your profession. Teach others, give talks, volunteer for your local society or AAPG, speak to students, become a docent at the museum. Find a means that is gratifying to you and share your knowledge, enabling the passing of our shared heritage as petroleum geologists.

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Daniel J. Tearpock

Excellence That Runs Deep

Subsurface Consultants & Associates is proud to be a sponsor of the Division of Professional Affairs tribute to *The Heritage of the Petroleum Geologist*. We would also like to recognize the contribution to our industry's heritage by SCA's founder.



Career History

Born 1948 in Nanticoke, Pennsylvania; died 2014.

1970	BS degree in Geology, Bloomsburg University
1977	MS degree in Geology, Temple University
1978–1979	Sperry Vickers (geothermal)
1980–1983	Atwater Consultants
1984–1988	Tenneco Oil Company
1988–2012	Subsurface Consultants & Associates, LLC (SCA) Founder, President and CEO
2012	Recipient of DPA's Heritage Award
2012–2014	SCA Chairman Emeritus

My Proudest Accomplishments

One of my goals was to do something significant for the world. At first I thought I could find that billion barrel field, or find some new energy technology to help people. Instead I ended up founding SCA and began training and consulting. SCA has trained over 23,000 people all around the world and they are now

finding oil and gas. Our consulting company has helped people find and develop over 6 BBOE. So, in a roundabout way, I was able to accomplish what I set out to accomplish in life. I could not find a better group of friends and associates than I have found working in the oil and gas industry." <https://www.youtube.com/watch?v=JwtztVL2KUw>. (Video credit: Charles and Linda Sternbach)

My Biggest Disappointments

Dan had commented that one of his biggest disappointments was learning that he had pancreatic cancer: "We are all aware that our time in this world is limited, but we tend to never think that someday our life in this world will end."

Another disappointment he expressed was waiting so long to make Diana Poon his wife.

An Anecdotal Story

When I graduated from college in 1970 it was the beginning of a job market slump, which included geology that lasted well into the 1970s. My father's and mother's families were coal miners in the anthracite mines of Pennsylvania. As a young lad I grew up in the Appalachian Mountains about 500 yards from the nearest coal mine; played in the mines as a kid, collected lots of fossils and really neat rocks and minerals. Now at that time, I was not planning on a career in petroleum geology. But instead my dream was focused on becoming an astrogeologist and exploring other planets. Alas, due to the downturn, I had to make a career detour for a few years, starting up my own computer services company 2 years after graduation.

Oh, how I missed the world of geology! So after a few years, I went back to school and received my Master's degree in geology from Temple University. After getting my Master's degree, it was clear to me that astrogeology was still not on the horizon as a promising career opportunity; I needed to look else-

where. So it was off to the sunny south, specifically Jackson, Mississippi. For the last 35+ years I have enjoyed an exciting, challenging, and very rewarding career in the field of petroleum geology. And the rest is history.

My Advice to You

1. Live each day as if it is your last day, for some day, it will be.
2. Learn and practice the *10 Habits of Highly Successful Oil Finders*.
3. Read a technical article a day and keep up your training. Take the class *Applied Subsurface Geological Mapping*. It will help you become more successful in this industry.

Heritage of the Petroleum Geologist

Edited by

Robert C. Shoup

Deborah K. Sacrey

Charles A. Sternbach

Richard L. Nagy



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Preface

Not so long ago, it was common for older geologists and geophysicists to sit together with younger employees for morning coffee or, on occasion, an afternoon beer. During those times, we would often hear tales of how this or that prospect got drilled or what happened to so-and-so while he (back then it was almost always a he) was sitting a rig.

For most companies, this getting together of old and new does not seem to happen much anymore, which is truly a shame. Those stories not only helped

to build a level of camaraderie not seen much in the industry today, they also helped us to learn — to gain experience from those who had been there and done that.

So for those of you who miss those shared experiences or for those who have never had the opportunity to hear some of the old-timers' stories from the oil patch — here is your opportunity. Sit back, pour yourself a cup of coffee or a glass of beer, and enjoy!



The Southwestern Association of Petroleum Geologists met in Tulsa, Oklahoma, at Kendall College (later the University of Tulsa) on February 10, 1917, to form the American Association of Petroleum Geologists.



Guests swapped stories on the heritage of the petroleum geologists at the DPA/SIPES Convention Luncheon on March 12, 2002, during the AAPG Annual Meeting in Houston, Texas.

Introduction

By Robert C. Shoup

In the early planning stages of the 2002 AAPG Annual Meeting, to be held in Houston, convention chairman Jeff Lund and vice chairs Charles Sternbach and Deborah Sacrey decided on the convention theme of “Our Heritage, Key to the Future.” In planning the Division of Professional Affairs luncheon for that meeting, I felt strongly about keeping that theme and honoring our heritage. It was decided that not only would we get Michel T. Halboty to be our luncheon speaker, but we would invite industry notables to be our guests at the luncheon, each “hosting” a table. Because there is no such thing as a “free lunch,” we also asked each of the guests to provide answers to the following questions:

- What was your proudest accomplishment?
- What was your biggest disappointment?
- What advice would you give us?

The answers were compiled in a booklet that was handed out to all attendees of the DPA luncheon. The booklet was an immediate success, and we have received numerous requests for copies.

In light of that success, AAPG’s Division of Professional Affairs has agreed to subsidize the cost of this book. Each of the luncheon’s heritage guests was contacted, along with other individuals who had been unable to attend the luncheon. We asked all of them to provide one more item — an anecdotal story that

would fit with their proudest accomplishment, their biggest disappointment, or their advice.

What follows are the recollections, stories, and advice of 43 of the most successful people in the industry.

What is it that separates successful individuals from the crowd? What is it that they do or have that allows them to be successful — or are they just lucky? Luck certainly plays a role, particularly in the oil and gas business, yet the ingredients to success are certainly more than that. Psychologists and business consultants have looked for years for the answers to these questions, generally concluding that there are too many variables to success to define one or two key ingredients.

Perhaps that is so. I am certainly not a psychologist, and I do not have an M.B.A. However, in reading the stories and the advice of these 43 people, I certainly sense a pattern — a key to the success of these individuals. They all believed deeply in what they were doing, and they had the perseverance to do what it took to see their ideas through.

As you read the stories in this book, I expect that you will at times find them to be thought provoking and at times amusing. It is my hope that you will also find this book to be inspirational.

The stories included herein are part of the vast heritage that we as petroleum geoscientists have. Where would we be without our heritage? Every concept, every idea would need to be regenerated, with the result that the world would have certainly run out of oil and gas — not because we would have exhausted the supply. Rather, we could not have sustained a pace of drilling that would have matched the demand.

The ideas behind every well that we drill today have been built on the ideas of others who have walked before us. Our heritage is a rich one and includes many noted individuals — Lyell, Hutton, Drake, Joiner, Platt, Levenson, and Halbouty — as well as other people who have contributed to this publication, to name but a few. But just as important, our heritage also includes those individuals that few may have heard of — those who took the time and effort to take you under their wing and serve as your mentors.

I remember being on a field trip many years ago. We had stopped at an outcrop noted for containing fossil sharks' teeth. None of the trip participants had any trouble finding a good collection of teeth, whereas I found none. As we were nearing the time when we needed to leave, my good friend and mentor Blair Parrott came up and asked what was wrong. I confessed that I was not finding any sharks' teeth. He bent down and pointed to a slightly darker spot in the shale, noting that this is what they look like in the outcrop. Almost as if by magic, I saw dozens of sharks' teeth where minutes before I had seen none. I too was able to get a nice collection of sharks' teeth.

This story illustrates to me the best of mentoring.

Blair, as a good mentor, observed that I was having difficulty and approached me. Just as important, I had to be willing to admit that I was struggling — something our pride, or fear of ridicule, often prevents. Most important, I realized that you can't find something until you know what it looks like.

For those of you who are students or are just beginning your career, look for people who are willing to be your mentors — people who will show you the ropes. Go to them and ask them to be your mentors. You will find that most of them will be honored that you asked, and will be more than willing to provide guidance.

For those of you who are well established in your career, you should seek both to be a mentor and to have a mentor. You are at the point where you can serve as a mentor to students and to those just beginning their careers. You are likely to find the experience both rewarding and rejuvenating. At the same time, you should get to know consultants and independents so that you can, if you desire or need to, make that transition in your career.

This book is therefore dedicated to all those individuals, noted and anonymous, who have been or will be mentors.

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The Past Is a Beacon for the Future

Michel T. Halbouty

Note: The article below was Michel T. Halbouty's address at the DPA/SIPES luncheon at the Annual Meeting of AAPG in Houston, Texas, on March 12, 2002.

I am pleased to have the opportunity to speak to this group today. I will try to portray to you some of the meaning of our profession and some of its effect on society.

The theme of AAPG's 2002 meeting is "Our Heritage: Key to Global Discovery," and it is most appropriate and timely that this topic is selected and presented at the beginning of this century. It is a subject that will have a profound effect on our profession in the future. We — as petroleum geologists — have built an incomparable heritage of knowledge that is readily available for our endeavors of the future.

When I became a member of our profession 72 years ago, I picked up the petroleum-geology heritage that was available. There wasn't much. Petroleum geology was still in its infancy, and those of us who were in the profession had to crawl and strive for any type of information or available data. Our correlating mediums were micropaleontology and drillers' logs. Because of the scarcity of information, we worked hard, and made our findings available to each other. Therefore, those who later entered the profession were able to step into petroleum geology with the knowledge accumulated up to the time of their entrance into the profession.

Gee — I look back at what I knew at the time I entered the profession to what I know now, and it seems I have gone through countless hours and days of just keeping up with the advances. There was very little heritage to lean on, but what was available was absorbed with relish.

Now, the science of geology, in which our petroleum geology is just a segment, is the most intriguing of all sciences. The story of this earth, the evolution and destruction of continents, the processions of life which since the beginning of time have passed over its surface are the basics of the science of geology.

It really became a science during the Middle Ages, when the philosophers of nature undoubtedly were influenced by the Aristotelian elements of "fire, air, earth and water." They sedulously examined the objects of nature in their natural state and traversed the fields, the mountains, the woods and the waters,

and checked the oceans and the shores. By these efforts, they became proficient in natural knowledge — thus they established the beginning of the heritage of geology.

Geology has grown and advanced on the balance scale of probability rather than the rigid, less flexible framework of mathematics; thus geology always has been an *inexact*, speculative science.

Commonly suffering from speculation beyond the limits of observation and experience, geologic hypotheses and theories have been promulgated and dissipated, but not without some benefit to each succeeding generation of earth scientists. It is precisely this inexactness of our science which makes it such a great challenge to practice it.

I firmly believe that there is no factor vital to the human race which the science of geology does not explore or participate in to some extent, however remote. From time to time, I reflect on conditions that exist in the world, and I conclude — over and over again — that the world's people could not meet their many human needs without geologists, who discover the supply of natural resources vital to their welfare and comfort.

Geologists and geophysicists together are imperative to the future petroleum-energy stability of this nation and the world. We are needed to find the oil and gas that remain to be found, both onshore and offshore. Without us, no oil and gas would be discovered. In this regard, our profession cannot survive without exploration, and neither can the basic energy security of this nation. We are tied together; if one falters, so does the other. This is why I refer to our profession as the indispensable segment of the science of geology. We are fortunate to be involved in this extraordinary effort.

Our profession of petroleum geology indeed had a unique beginning. Petroleum geology's first item of legacy began in 1842, when Sir William Logan, the Montreal geologist who was director of the Geological Survey of Canada, studied the petroleum springs at Gaspé, in his native province of Quebec, and stated that they were located and associated with anticlinal folding. Logan's comments on these seeps were the first expression of the anticlinal theory with relation to oil accumulation.

Many geologists of that time could not agree with the theory, and it became one of the most controversial of subjects, particularly on both sides of the Atlantic Ocean. For about 40 years, the controversy continued between geologists. In 1880, one of the more accom-

plished geoscientists of the times, J. P. Lesley, referred to the theory as a “deservedly forgotten superstition.” This was 21 years after Drake had discovered oil at Titusville, Pennsylvania, in 1859. Still, the top geologists of the world argued about a concept that Sir Logan had proposed in 1842.

In 1883, John Galey, the wildcatter, and William A. Erseman, a Pennsylvania oil operator, independently informed their friend, Dr. Israel C. White, a professor of geology at West Virginia University, that their land and drilling observations indicated there definitely was some relation between existing oil and gas fields and anticlines.

White immediately became interested. He diligently studied the concept. He went into the field, studied the rocks, and finally concluded that the theory was sound. He believed in it so strongly that he took leave of his position at West Virginia University to form a company and drill a well, using the anticlinal theory as its basis. The result was the discovery of the first significant production in West Virginia. White then returned to the university a much wiser, wealthier, and more respected professor of geology.

Later, White announced his rediscovery of the anticlinal theory, but in doing so he acknowledged freely the priority of others. This he made clear in his 1885 paper, “Geology of Natural Gas.” That paper was followed by the publication, in April 1892, of another on the anticlinal theory, in the *Bulletin* of the Geological Society of America.

Undoubtedly, these two papers by White gave petroleum geology its first status and the permanency of the anticlinal theory. Thus, Dr. Israel C. White is credited by historians as the founder of our petroleum-geology profession. Incidentally, White was the third president of AAPG.

Now — the most important segment of this story is the fact that as celebrated geoscientists were arguing among themselves as to the validity of a concept, wildcatters who were not formally trained in the science of geology extolled the virtues of the concept, which turned out to be accurate.

Even after Dr. White’s intervention, petroleum geology had numerous difficulties remaining a respected profession. Many errors and misconceptions by geologists — and condemnations by geologists of areas which turned out to be productive by random wildcatters — caused the managers in the oil industry to be not only reluctant but also most hesitant to openly recognize the profession.

Although the early practitioners of our branch of geology were beset by great problems, they were true investigators and, in a scientific manner, tried to form concepts on a subject which was new to them. They

stuck their necks out, and some were “chopped off.” However, through the efforts of these stubborn scientific pioneers, the fundamental pieces of petroleum geology gradually were put into proper place. The fact that these early petroleum geologists were at times wrong did not discourage their search for the truth. For the past 110 years, their discoveries, mistakes, confusions, and solutions have given us the total results of their efforts — a remarkable heritage.

The heritage of geologic fundamentals that was handed down to us was accompanied by another kind of inheritance — the application of common sense, courage, stubbornness, and intestinal fortitude in the search for oil — from the nonprofessionals, the wildcatters. They drilled thousands of wells, leaving us volumes of critical geologic information. These daring wildcatters gave petroleum geology new concepts, new ideas, and different viewpoints. They gave greater strength to a profession which they generally regarded as inadequate and inefficient.

Their accomplishments and input to our profession further prove that scientists are occasionally helped by the bold, imaginative, creative thinking and exploration of those who are not formally educated or even trained in a scientific discipline.

Now, let’s talk about the “suppressor” — the know-it-all! There are some in our profession who are prone to suppress unusual ideas of their coworkers, putting them down for even thinking differently than they. It is the know-it-all who stifles brilliant ideas with the overbearing arrogance born of ignorance, because it is from these unyielding, onerous, omnipotent thinkers that we learn that all is not as it seems and that often brilliant minds are forced to veer from the truth.

Those “suppressors” generate apprehension and fear that prevent free and creative thought. There is no question that fear stifles boldness in the explorationist — not being willing to express an unusual exploration idea or concept for fear of losing a job or being shuttled into an inferior position. As a result, creativity and boldness in the exploratory effort are discouraged by rebuke and fear, which prevent new exploratory thinking. Instead, mediocrity, “going along with the boys,” and “implied assent by silence” are, unfortunately, the credos of many people who are engaged in petroleum exploration.

As hunters for petroleum, we should not ever be afraid to experiment with an unusual idea or concept — and once you believe that you are correct in your analyses, stick with it and go for it. It may be a failure, but at least you gave your conviction a chance. I remember the often-quoted phrase, “The greatest risk is not taking one!”

As part of this presentation, I will go back many decades and relate to you three incidents I remember vividly that portray the optimism, pessimism, and emotions of explorationists — and wildcatters.

First incident – Optimism

I happened to be in the same elevator with Roy Cullen, who was one of the pillars of Houston and, at the time, one of the most successful independents in the petroleum business. I am referring to the year 1935 — 67 years ago.

He looked at me and said, “Aren’t you the geologist associated with Glenn McCarthy?”

I said, “Yes, sir!”

He invited me to get off the elevator on his floor, because he wanted to show me something. He took me to a large cabinet where many gadgets were displayed.

He said, “I don’t believe in geology — it hasn’t found me anything, but you see this one,” pointing to one of the items in the case, “I found the O’Conner Field with that,” and he pointed to one after the other, naming the fields the gadget had found.

I stood in awe of what Mr. Cullen was telling and showing me. As far as he was concerned, he had absolute proof that those gadgets had found him the tremendous wealth he made from oil. His belief in those ingenious articles was unquestionable and unassailable.

Although neither of us believed in the other’s method in searching for petroleum, we became good friends — a youngster in his twenties and a wildcatter in his seventies.

I learned something very important from that episode — *that the power of conviction is absolute in whichever direction it is subjected!*

Next incident – Pessimism

I was attending an American Petroleum Institute meeting in Chicago and ran into a friend who was an independent I had not seen in a couple of years. We visited over a drink, and a bellman to whom I had previously indicated I was expecting a call advised me that the call was ready. As I got up to leave, I told my friend I hoped this would be good news of a wildcat I was drilling.

When I came back, my friend asked if I had good news, and I told him, “No, it’s a dry hole.”

He said, “Does that surprise you?”

I replied that it certainly did, because I had expected a discovery.

He said he expected every wildcat he ever had anything to do with to be a dry hole. *I was startled.*

I said, “That’s total pessimism!”

I also told him I expected my every wildcat to produce, and if any were dry holes, I just looked around the corner for the next wildcat.

He didn’t stay in wildcatting very long. Pessimism is not for the hunter of oil and gas.

As I have stated over the years, I firmly believe that positive thoughts generate positive results, and pessimistic thoughts generate negative results.

Last incident – Emotions

I have always said that wildcatting brings euphoria and heartaches — but some heartaches linger!

I’ve drilled thousands of wells, but the greatest anguish of all was my first well in Alaska. I studied Alaska’s geology — I made several trips, studying the rocks on foot with a rifle and a pack on my back. I traveled by truck and bush planes, and I was convinced that oil would be found in that cold and foreboding area known as a territory of the United States.

All of my fieldwork was done in the late 1940s and early 1950s — more than 50 years ago — and to my knowledge, no one, large or small, was even thinking of exploring in Alaska. I leased thousands of acres from the territory, and I was stuck with the provision that if it became a state, all my leases would be null and void except those on which actual production of oil or gas existed.

Here I was — the first independent to go into and explore in Alaska. I might say that it took not only intestinal fortitude but, to put it in the proper vernacular, unmitigated guts! I was a small but very adventurous independent, and Alaska attracted me like a moth to light.

I moved a brand-new rig from Bakersfield to Long Beach, California, to Seward, Alaska, and spudded my first well 16 days after I signed the rig contract. Even though I had geologists and petroleum engineers in my company who could have been involved with moving the rig and drilling the well, I was so captivated with the possibilities of a discovery in that remote area that I chose to supervise and have *fun* doing it all myself.

Twelve wildcats were drilled with the rig — I found one small gas field.

After 15 years, Alaska overwhelmed me, and I got out. I had met bitter disappointment after disappointment in a giant area that I had extolled — an area where I had marched in alone to lease and drill my most significant career wildcat.

In later years, I was visiting with several young geologists at an AAPG Annual Meeting and one said to me, “Mr. H. I understand you lost many millions in Alaska.”

I said, “Yes, that’s true — but I still consider my Alaskan venture a success.”

He asked, "How can you possibly consider it a success, losing that much money?"

I hesitated, looked him in the eye, and said, "It was a success to me, because I had the desire to do it — *and I did it.*"

So the question arises, "Why did I do it?"

I did it because it was the greatest challenge I had ever faced, and I confronted the challenge head-on. I challenged the challenge! I was prepared to accept the outcome, whatever it was, but more important, as a wildcatter, *I had a firm belief, a strong conviction*, that I would discover oil — lots of it — in Alaska, and I set out to prove my conviction.

Success is measured in many ways other than by money. The Alaska venture was a tremendous display of effort for someone as small as I was — of meeting obstacles and challenges in a very hostile environment, with virtually no support or ready availability of materials.

The venture in Alaska is my proudest effort — and yet, after all these years, my first Alaskan wildcat remains the most bitter disappointment of my career. That well was a *killer*. When I was on the derrick floor at about midnight in bitter cold — 25 below zero — and the last objective was cored and found dry, it affected every fiber of my body and left me limp and full of depressive emotions. *I was totally crushed*. I had put so much of myself in that one well that the unexpected dry hole devastated me. The disappointment was so severe, I literally cried.

I remember many of my wildcats — some of the good ones and some of the bad ones — but that Alaskan wildcat I drilled 45 years ago gnaws at me to this very day. It proves that in the throes of success, there are unexpected and sometimes bitter disappointments that are beyond comprehension or acceptance.

In three months — God willing — I will be 93 years old. I am definitely in my twilight's twilight zone. Whatever I have done or didn't do, whatever were my successes or failures, above all, I was always exceedingly proud to be a geoscientist — a student and disciple of the earth. I would be well rewarded if any of my efforts contribute to the heritage which is ours to pass to those who follow us.

I have enjoyed visiting with you today — and I extend my heartiest wish for all of you to enjoy good searching for the oil and gas which the world will be needing for the future.

Thank you for listening.

Heritage of the Petroleum Geologist

Michel T. Halbouty
Houston, Texas

Note: The article below was Michel T. Halbouty's presidential address at the Annual Convention of AAPG in Los Angeles, California, on April 11, 1967. It was printed originally in the *AAPG Bulletin*, v. 51, no. 7 (July 1967), p. 1179–1184.

The heritage left us by the early petroleum geologists has been ignored and practically forgotten. Those geologists should be remembered not only for their achievements, but also for having been well-rounded, true geologists who applied all facets of our science to their endeavors. Their methods and contributions should be "dusted off" and restudied, and once again used as guideposts for our future thinking. The intrepidity, firm persuasion, and complete dependence of these men on sheer intellect created the basic concepts which resulted in world-wide, successful petroleum exploration. In order to meet our exploration requirements of the future, the profession must develop more original ideas, and not be afraid to push those ideas forward into fruition. We must once again become true geologists — well-rounded and knowledgeable. It is only then that we can emulate successfully our predecessors, who as scientists and free-thinkers conquered their problems through their strong courage of conviction; it is only then that we shall have paid our debt to them for the inheritance which they left us and our debt to our profession — for the heritage that we build upon and leave for our successors.

On February 10, 1917, this Association was founded; thus we are 2 months and 1 day into our second 50 years. I believe we have good reason to be proud of our first half century since 1917 — the year our country entered the First World War — 50 years and 5 days ago.

There were also important events in the petroleum industry that year — 1917. They include the founding of Phillips Petroleum, the formation of Humble Oil and Refining Company, Shell's discovery of the Bolivar Coastal fields in Venezuela, the first gravity survey of a salt dome — in Germany — the discussion by two young physicists named William Peter Haseman and John Clarence Karcher of the use of seismic waves to determine subsurface structures, and the confiscation of all private oil properties in Russia.

Also, in 1917 an official of the Bureau of Mines looked over the U. S. oil supply situation and said that the United States faced "... a national crisis of the first magnitude." He predicted nothing ahead except declining production, rising prices, and an acute oil shortage. Until then the United States had produced approximately 4 billion barrels of oil in 58 years.

Well, what happened? Since then we have produced 75 billion barrels of oil and have 39 billion barrels more in reserves, to say nothing of vast reserves of natural gas.

Those were the days, too, when young men were being advised by the elders of our industry to get into some other field of endeavor because the oil industry was "all washed up."

I believe the major share of credit for the reversal of that pessimistic trend of thinking was due to the men who met 50 years ago and organized our Association. This is an important part of our heritage. Webster defines heritage as "... that which is inherited, inheritance; hence, the lot, condition, or state into which one is born; a birthright."

From the beginning, geology has grown and advanced on the balance-scale of probability rather than in the rigid, less flexible framework of mathematics; thus geology always has been an inexact, speculative science. Commonly suffering from speculation beyond the limits of observation and experience, geological hypotheses and theories have been promulgated and dissipated, but not without some benefit to each succeeding generation of earth scientists. It is precisely this inexactness of our science which makes it such a great challenge. It takes real courage to meet this challenge.

Thus, the philosophers of nature during the Middle Ages undoubtedly were influenced by the "Aristotelian elements" of fire, air, earth, and water. Werner and the Neptunists, and Hutton and the Plutonists, gained many of their ideas from the published works of Agricola on mineralogy. Each of these men had a heritage on which he progressed in his own pursuits. These men, their forebears, their colleagues, and their successors all contributed in some measure to our heritage.

Lesser known, yet very influential men, such as John Walker, a professor and a naturalist, established the existing foundation for seeking and probing into the earth. Walker's influence must have been most profound because among his students are the names of James Hutton, John Playfair, James Hall, and Robert Jameson — all of whom later became great geologists and scientists. In 1779, just 188 years ago, at the University of Edinburgh during one of a series of lectures on geology, John Walker told his students:

"The objects of nature themselves must be sedulously examined in their native state, the fields and the mountains must be traversed, the woods and the waters must be explored, the ocean must be fathomed, and the shore scrutinized by everyone that would become proficient in natural knowledge."

As geologists, by inclination and thorough training, we should be imbued with a love for exploration of the earth in order to solve its many mysteries. To be recipients of the geological heritage handed down to us, we can do no better than follow the advice of Walker.

The heritage of the petroleum geologist, that avocational specialty which most of us assembled here have adopted as our professional domain, has a broad base, developed and matured by scientists and non-scientists alike. It is built on the labors and achievements of our predecessors, who, by meticulous observation of nature and careful deduction therefrom, laid the scientific foundation of the profession. It is also built, in no small measure, by the successes, failures, and experiences of many non-professionals — such as the non-scientists who probed beneath the surface of the earth in search of hydrocarbons.

Among our early petroleum-minded predecessors who contributed to our heritage, there comes to my mind Sir William Elwood Logan, the Montreal geologist who was director of the Geological Survey of Canada for more than a quarter of a century. In 1842, or 17 years before the birth of the oil industry, Sir William Logan studied the petroleum springs at Gaspé in his native Province of Quebec, and stated that they were located and associated with anticlinal folding. As far as I know, Logan's comments on these seeps were the first expression of the anticlinal theory with relation to oil accumulation.

Another of these early pioneers was Henry D. Rogers, once head of the Pennsylvania Geological Survey, who gave a remarkable lecture at the University of Glasgow in 1860, shortly after the Drake well came in, on the subject of the distribution and probable origin of petroleum in western Pennsylvania.

It was at this time that discussions of the anticlinal theory as it relates to petroleum became one of the most controversial of geological subjects. The participants include the versatile but sometimes erratic T. Sterry Hunt, Ebenezer Andrews, J. P. Lesley, and the brothers, William and Henry D. Rogers.

This select group might be called the instigators of interest in petroleum geology, although they did equally well in confusing the subject, with the result that it took another 20 years before Dr. Israel C. White actually founded the petroleum geology profession.

Lesley, for example, after his early pronouncement

of the anticlinal theory in 1860, changed his mind and vigorously denounced the theory in a paper published in 1863. As recently as 1880 he referred to the theory as that "... now deservedly forgotten superstition." He was indirectly replying to the Austrian geologist, Hans Hofer, who was taking a new and serious affirmative interest in the theory.

Three years later, independently, John Gale, the wildcatter, and William A. Erseman, a Pennsylvanian oil operator, called White's attention to their field and drilling observations that there definitely was some relation between existing gas fields and anticlines. White immediately became interested. He diligently studied the concept — he went into the field, studied the rocks, and finally concluded that the theory was sound. He believed in it so strongly that he decided to take leave of his position as professor of geology at West Virginia University to form a company which drilled a well, using the anticlinal theory as its basis.

The result was the discovery and establishment of the first significant production in West Virginia. White then returned to the university a much wiser, a wealthier, and a more respected professor of geology.

Later White announced his re-discovery of the anticlinal theory but in doing so he acknowledged freely the priority of others. This he made clear in his 1885 paper on "Geology of Natural Gas." That paper was followed by the publication in April, 1892, of another on the anticlinal theory in the *Bulletin* of the Geological Society of America. There is no doubt that these two papers by White gave petroleum geology its first status, and the anticlinal theory permanency. Incidentally, White was the third president of our Association.

Petroleum geology had numerous problems facing it in order to remain a respected profession. Many errors and misconceptions by geologists, and condemnations by geologists of areas which turned out to be productive, caused the oil industry to be not only reluctant but also most hesitant to recognize the profession.

Although the founders of our branch of geology were beset by great difficulties, they were true investigators and in a scientific manner tried to form concepts on a subject which was new to them. They "stuck their necks out," and some were "chopped off." However, through the efforts of these stubborn pioneers, the pieces fundamental to petroleum geology gradually were put into proper place. The fact that these early petroleum geologists were, at times, wrong did not discourage their endeavors to arrive at the truth.

Through their discoveries, their mistakes, their confusions, and their solutions, we have had given to us the total results of their efforts; *this* is our heritage. It

consists of geologic truths, and carries no obligation — except that we carry on from where our predecessors left off. Thus, this heritage must be a continuum, based on more study, exploration, curiosity, failure, success, and total effort so that we, in turn, may hand down to our geological successors a heritage greater than that which we received. We must not break the continuum. This is our responsibility to geologists of the future and to the science of geology, and of petroleum geology in particular.

The heritage of geological fundamentals that was handed down to us was accompanied by another kind of inheritance — the application of common sense, courage, stubbornness, and intestinal fortitude in the search for oil — from the non-professional — the wildcatter!

Such men include Edwin L. Drake, the railroad conductor, and his associates who explored, experimented, and gave birth to the petroleum industry in 1859. Another is John Gale, an adventurer in the oil fields, who was bold enough to suggest and promote in 1883 a practical application of the anticlinal theory when the geologists chose to criticize and write papers about it.

Still another is a woodsman named Pattillo Higgins who learned to know and love what he called the "signs of nature," and thereby led Captain Anthony Lucas, a marine engineer, to the discovery in 1901, in the dawn of a new century, of the gusher at Spindletop that brought forth the liquid fuel age.

To these I would add the name of Marrs McLean, a man, educated as a lawyer, who made a living selling advertising, and then promoted oil leases but who conceived the idea in 1923 that oil could be found on the flanks of salt domes. His concept was rejected by the most renowned petroleum geologists of his day. Nevertheless, McLean's theory became completely accepted by our profession in 1926 when my first employer, Miles Frank Yount, bought the idea and leases from McLean and was rewarded with a new great discovery at Spindletop — the opening of the vast reserves on the flanks of this historic salt dome.

I could not resist mention of another adventurer who had an idea based on an unsound theory by a self-styled geologist, an idea which brought forth the greatest oil discovery in the history of the North American continent, in Rusk County, Texas, in 1930. His name was Columbus Marion Joiner. He was a 70-year-old promoter whom everyone called "Dad." He accepted the word of Dr. A. D. Lloyd — a man who was trained as a veterinarian but who delved into geology as a hobby — that oil was to be found in East Texas. Almost every geologist — and I might add geophysicist — of that period had come to regard the area

as worthless and condemned it as an economic graveyard that would be studded with dry holes. In fact, by the time Joiner and Lloyd arrived on the scene nothing but dry holes dotted the sandhills of East Texas.

Nevertheless, Lloyd wrote Joiner a letter telling him almost exactly the depth at which he would strike oil. He also told him why. We know now that scientifically his reasoning was wrong, but we also know now that what Lloyd and Joiner combined to accomplish led our profession to a greater recognition of the vast potential of the stratigraphic trap.

The books are full of examples of men finding oil by the "seat of their pants" in areas where geologists feared to tread. The reason for this fear is that geologists had forgotten — or never learned — the words of John Walker. They failed to examine on the ground "the objects of nature"; they failed to traverse "the fields and the mountains"; they did not explore "the woods and the waters"; above all, they failed to examine the rocks.

These daring wildcatters gave petroleum geology new concepts, new ideas, and different viewpoints; they gave greater strength to the profession which they generally regarded as inadequate and inefficient. Their accomplishments further prove that scientists are helped sometimes by the bold, imaginative, creative thinking and exploration of those who are not formally educated, or even trained in the scientific method.

Of course, it is a compliment to our profession that these suddenly discovered ideas were seized on by our predecessors, placed in the proper frame of nature's jig-saw puzzle, and put to use to find many times more hydrocarbons.

Scientists whom many of us have known or know now — E. T. Dumble, J. A. Taff, Charles N. Gould, Charles Eckes, W. A. J. M. van der Gracht, W. E. Wrather, E. DeGolyer, Alexander Deussen, Paul Weaver, Ben Belt, A. I. Levorsen, Wallace Pratt, Frederic Lahee, Frank Morgan, Lewis G. Weeks, Frank Clark, Sam Grinsfelder, and Ira Cram, and a host of others, most of them members of our own Association since its founding a half century ago — have added to the heritage handed them and have brought us to the point where we now are.

To this list one might add a host of better and lesser known men of geology who have contributed their ideas and concepts, large and small, important and less consequential, to the reservoir of knowledge we now have available in the field of earth science as it applies to petroleum. We might also add the names of numerous non-scientists, in addition to Drake, Galey, Higgins, Lucas, McLean, Yount, and Joiner, whose natural instincts or good fortune have led them to geolog-

ical achievements which have benefited all of us and all of mankind.

Each of us also might recall some men who have stifled brilliant ideas with the overbearing arrogance born of ignorance, because it is from men such as these that we learn that all is not as it seems in this inexact science, and that without open minds we commonly veer from the truth.

Thus this heritage of the petroleum geologist is based on the works of many men, those who have been right and those who, from time to time, have been dramatically wrong.

This heritage serves as the framework and guidepost to our knowledge of petroleum geology. We must build on it and hand down to the next generation a stronger and broader heritage of knowledge. We must boldly and creatively seek new knowledge, through ingenuity, and, although beset with failures and wrong turns, we must ferret out this new knowledge and add it to our heritage.

What about our shortcomings as petroleum geologists? The truth is that, as a whole, we have failed many times to employ our science properly. We have depended too much on other disciplines to guide us and have not practiced our science as it should be practiced — in fact, *we have lost, in some measure, direct contact with the earth*. By losing this contact, we have lost our curiosity for its mysteries and, in turn, we are becoming less creative and less courageous.

We have subjected ourselves to routine thinking, without probing and seeking to understand better the true meaning of our science. We have become afraid to experiment mentally into an unusual concept or idea. Ironically, those who employ or use our knowledge do not expect our bold and creative ideas always to be right. A major-company official said to me not long ago, "Show me a geologist or geophysicists who is afraid to make a recommendation for fear of his making an error in judgment, and I will show you a man who is not only stealing my company's money and time but one who is hardly worth being called a scientist."

What this executive was saying is that such fear stifles boldness in the explorationist. In short, this executive was complaining that some geologists and geophysicists are not willing to take a chance — and are not willing to express an unusual exploration idea or concept for fear of losing their jobs. As a result, creativity and boldness in the exploratory effort are discouraged by this fear of failure, and nothing is contributed to exploratory thinking; instead, mediocrity, "going along with the boys," and implied assent by silence are the credos of many who are engaged in petroleum exploration.

What John Walker said in 1779 is as applicable

today as ever. The true explorationist *must* get out of the office, go into the field, the plains, and valleys, traverse the woods, and the mountains, and the seashores; he *must* look hard at the rocks, and at any other “signs of nature” that he can find.

Pattillo Higgins observed the “signs of nature,” and led all men to a new age of progress — yet he was not a geologist. He went to the top of a little rise in a flat prairie and observed that there was a sandy loam where clay was supposed to exist, a peculiar substance in the soil which had a “waxy” feel and which later was named “paraffin dirt” by geologists; and he also tasted brackish water in wells of fresh water. These “signs of nature” enabled him to proclaim openly that he could drill wells on that spot which would produce tens of thousands of barrels of oil daily. He was denied by experts, including geologists, and even scorned by his neighbors. But his faith in what he believed led to one of the world’s most important mineral discoveries of all time.

Ben Belt, the scientist, climbed in an old automobile and crossed and criss-crossed the arid land of west Texas, facing hired gunmen guarding “posted” signs or ranchers with shotguns, to seek out rocks that would tell him what he wanted to know. When he had finished his study of the rocks, and plotted his data on his maps, he developed an idea that decided his company to purchase hundreds of thousands of acres of land in the Permian basin. On this land production was found which helped make the name of Gulf one of the greatest in our industry’s history.

Charles Gould, in addition to his many other achievements, went into the field in the Texas Panhandle and came back with a geologic report to his employers recommending the drilling of a well. This well led to the discovery of the vast Panhandle gas reserves.

The prolific Yates oil field — one of the richest in the nation — came “roaring in” 40 years ago west of the Pecos River in Texas. Here was an area where wildcatters — and geologists — had said that “there is no oil.” However, there was a young man by the name of Frank Rinker Clark who thought otherwise. Even in the early 1920s, petroleum geologists were still the object of scorn, and a well witcher who located drilling sites with a sprig cut from a peach tree was considered to be more scientific and much smarter than a college upstart like Clark who hammered on rocks trying to find the right spot to drill for oil.

Clark’s surface studies convinced him that the area was a favorable one for the accumulation of petroleum and it was his recommendation to The Ohio Oil Company — now Marathon Oil Company — that resulted in the discovery of this giant field. Contrary

to the opinion of the best minds of that day, Clark “stuck his neck out,” supported his own convictions, and proved that oil could be found west of the Pecos River.

In each case, Higgins, the woodsman, and Belt, Gould, and Clark, the geologists, used their God-given right to think boldly — to think contrary to the everyday, run-of-the-mill type of mediocre thinking. They observed the earth; they understood what they observed; and they brought forth new discoveries, not only in energy but also in our science. By so doing, their names went down in history and up in the respect of their fellow men.

Today, the world consumes oil at a rate of approximately 30 million barrels a day. It has been said recently by economists that the 60-million-barrel day is now almost upon us. During the next 10 years, our industry will be required to find 55 billion barrels of oil and 300 trillion cubic feet of gas in the United States simply to maintain an adequate reserve position with the increased demand.

This will require us to utilize both all our heritage and to add much more to it; if we do not, we shall have considerable difficulty in meeting this tremendous challenge of the near future. Unless we think as creative and bold scientists, without fear of honest mistakes — and by so doing create new concepts — many of us here will live to see petroleum geology become as unacceptable as it was in its early founding years.

The one factor which the explorer must have to succeed is the strength of his convictions to take a chance.

I would like to make one more point. My friend, Frank Morgan, one of our great geologists, recently said to me that he can recall the time when a man first became a true, well-rounded geologist and later specialized to become a petroleum geologist. Frank continued his observation by pointing out that, when full courses in petroleum geology were established, many students by-passed the path of becoming a well-rounded geologist — instead they took the short route to a quick degree — in petroleum geology.

I heartily agree with Frank, and I might add that today matters are even worse. Petroleum geology specialization is reaching a ridiculous extreme in some university departments — with the result that many petroleum geologists are completely out of touch with the broad spectrum of geology, including the whole spectrum of petroleum geology.

The time has come, I believe, for us to return to the practice of being, first of all, true, well-rounded geologists. Today it is imperative that we know all aspects of our science. We must return to the role of the flexible, fully informed geologists who can answer any

call, anywhere, at any time, for whatever reason. In my opinion, this is precisely what Walker meant when he lectured his students nearly two centuries ago. We must get back to the earth if we are to succeed in our objective of finding petroleum for the future.

The purpose of becoming well-rounded geologists is not to prepare ourselves for such disasters as those which came along in the late 1950s and early 1960s when oil companies, large and small, started firing or laying off geologists or transferring them to some other work, or retiring them years ahead of time. The real purpose is to broaden our outlook and provide us with the opportunity to develop ideas outside our own limited spheres of activity. I know that the value of a good petroleum geologist will rise in direct proportion to his ability to see, to comprehend, and to be a part of the whole landscape of geology.

I believe, also, that a good geologist should break out of his geological shell and observe what is going on in the world of industry, economics, politics, and civic affairs. He should not permit himself to remain isolated — an island unto himself. He will have to meet and know the people with whom he lives and works. By so doing he will be able to broaden his thinking and his understanding of all that exists in the world around him. He will then be able to absorb valuable ideas, to revitalize his own processes of thought, to gain courage to express himself, and to be able to withstand any crisis.

He should know his community, work with it to help build a hospital or a museum, to serve on a school board or a symphony orchestra committee, or to lead a fund drive, as well as to know something about the other segments of his own industry.

While improving his position economically and socially, however, let the petroleum geologist not lose sight of the geological heritage which was his for the taking, and which prepared him in the fundamentals of his profession. Let him realize that he does, after all, owe something for having it. Let him learn to be a good steward, not to hide his knowledge, but to expose it and let it grow so that the heritage he leaves to his successors may be even finer than that which he received. This is what he owes.

Although I have more than 2½ months remaining to finish my term, I want to express my deep appreciation for the opportunity you have given me to serve as your fiftieth president. It is a singular honor which I hold above any I have received or will receive in the future. I have tried my utmost to serve you well. Only time will measure the success of my endeavors. I would be well rewarded if somehow I have contributed one small item to the heritage which is ours to pass on to those who follow us.

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John J. Amoruso



Career history

Born 1930

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|--------------|---|
| 1952 | B. S. degree, geology, Tufts College |
| 1957 | M. S. degree, geology, University of Michigan |
| 1957–1969 | Pan American Petroleum Corp. |
| 1969–present | Independent geologist |

My proudest accomplishment was:

My proudest accomplishment is having so many good friends throughout the geological profession, and being honored by them with election to the office of president of AAPG, AGI, SIPES, HGS, and GCAGS. I got to know them by being involved in the affairs of various geological organizations and working with them for the benefit and advancement of the science and profession of geology. If I had not been active, I would not have met a good many of them, and it would have been a great loss.

My biggest disappointment was:

The decline of oil and gas exploration, particularly in the domestic United States. The wildcatting spirit which made the United States a worldwide leader in petroleum exploration has largely disappeared. Oil and gas price volatility is no doubt the biggest reason, but another major factor is that many company managers and geologists no longer feel that “oil is first found in the minds of men.” Instead, there is a feeling that unless every technology possible is exhausted, regardless of cost considerations, there can be no prospect. There seems to be an unwillingness to accept reasonable exploration risk without having a technological escape avenue on which to blame a failure.

Anecdotal story

First experiences seem to be the most memorable, and one of mine occurred while I was well-sitting for the first time during the summer of 1956. I had a summer job with Stanolind Oil and Gas Company in Oklahoma City, between terms of my master’s degree at the University of Michigan. To learn something about well-sitting, I was sent to the field with Charles R. (Chuck) Noll as my mentor, to be indoctrinated on how to well-sit a drilling well. I was used to running samples from older wells, but not in real time. This was the first drilling well I had ever been on, so I knew little about operations. Chuck had the job of bringing me up to speed.

The well was located in southern Oklahoma near the town of Bokchito, close to the Red River. It was being drilled in conjunction with another company and was designed to penetrate the Ouachita thrust with as straight a hole as possible. We were watching the well in 12-hour tours with the other company. Because we were juniors, we had the night assignment. After a couple of days, Chuck was called back to Oklahoma City to relieve a geologist on another well, and I was on my own. The well was not challenging.

The temperatures stayed above 100 degrees day and night, and the well was drilling ahead at a dead-slow one hour 45 minutes per foot, in a seemingly unending dark gray orthoquartzite. It was a relief to get a five-foot sample. At about 2:00 a.m. one night, the roughneck opened the door of the small, un-air-conditioned trailer, said “Sample” to wake me up, and threw the sample bag onto the floor. Dutifully, I looked at it immediately and was shocked to wakefulness by the most beautiful oil show in a great-looking coarse, porous sandstone I had ever seen. I did all the tests to make sure the show was real — and it was.

Galvanized into action, I ran out to the rig and heard the brake squeaking away. I told the driller to circulate and highballed it into town to call my boss with what I thought was good news.

The boss was less than pleased at being awakened, and when I told him we had five feet of this show, he was not at all as enthusiastic as I was. He told me to go back to the rig and call him back if we had 20 more feet of the sand. I never saw the sand or the apparent drilling break again. The well continued to drill at the old rate of one hour 45 minutes per foot in the same old lithology.

I was convinced that the sample had been salted from some other, very good oil well, but I was careful not to bring up that possibility with the crew. Things had been pretty dull as the well ground endlessly down without change, and some excitement would have been appreciated. “Let’s see what kind of rise we

can get out of that weevil geologist” was probably the motivation. It worked, and I took the bait, hook, line, and sinker. Nevertheless, I am consoled by the fact that I erred on the side of safety.

Since the first well, I have seen a goodly number of shows, but none that seemed as good as I remember this one. I don’t know where it came from, but I’ve been looking for one just like it ever since. Maybe someday I will find another show as good, and if I do, I will make sure it isn’t a trick.

My advice to you is:

Be involved in the affairs of professional societies and give back something to your profession. Keep your professional expertise up to date by taking advantage of educational opportunities afforded by professional organizations. Use this broadened education with your work experience to be a more complete geologist and a better oil and gas finder.

Philip F. Anschutz

Career history

Born 1939

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|--------------|---|
| 1961 | B.A. degree in business, University of Kansas |
| 1961–1965 | Worked for my father, Fred Anschutz, an independent oil and gas operator based in Wichita, Kansas, and Denver, Colorado |
| 1965–present | Self-employed, the Anschutz Corporation |

My proudest accomplishments to date include the following:

My proudest accomplishment was starting up a business as a young man, and having it thrive in an industry that is not particularly forgiving of either inexperience or youthful start-ups and which can, and often does, punish mistakes severely. To be a small independent in a business that is high-risk, cyclical, and habitually short of capital was scary at times, breathtaking at others, but rewarding most of the time.

My biggest disappointment

My biggest disappointment was the Utah/Wyoming Overthrust Play. Although it was certainly successful, it just did not extend as far north or south as I might have wished, and where, regrettably, much of the additional acreage I had leased was located. The thinking that the acreage was on trend, which it was, was correct. Regrettably, the thinking concerning tectonics, timing, and reservoirs was not.

Anecdotal story

An incident that has always had a great effect and impact on me in later years is one that began when I was awakened from a sound sleep in the middle of the night by a phone call from the tool pusher of a rig I owned which was drilling a rank wildcat outside Gillette, Wyoming. He informed me that we had experienced a blow-out during the night, and the well was out of control.

I remember thinking, “Is this a disaster or an opportunity?” and almost turning the light out, going back to sleep, and lamenting my bad luck. Instead, I called the airport, hired a small plane, and flew to Gillette as quickly as possible, arriving at sunup. I managed to borrow a car from the airport manager and drove to the rig to see what was happening. The well was clearly out of control, with oil spraying over the crown block of the rig at an estimated minimum rate of 10,000 barrels per day.

By noon, I had sent lease crews into the field to lease

acreage on trend and on 30-day drafts. I had contacted Red Adair about capping the well and had contacted the insurance company and the offset lease owners, as well as the other interest holders in the well.

By late that evening, a Halliburton pump truck had come on location with an open engine stack and had sparked the gas, which eventually exploded, setting fire to the rig and the pools of oil around the rig, but fortunately not causing any loss of life.

By the following day, the offset lease owners and landowners had sued for damages, the insurance company had refused to honor the coverage, and Red Adair had refused to take the job of extinguishing the fire and capping the well unless I paid a large up-front deposit. The only good news was that the lease crews had been successful in leasing acreage on trend, but even that carried the bad news that I had only 30 days to pay to cover the drafts and had no money with which to do so. This of course was the same problem that Red Adair had recognized — hence his reluctance to take a job unless he had an up-front payment.

Facing the uncertainties of a major blowout, and lack of money and other financial resources to succeed, it looked like a recipe for disaster — not to mention that at that point, at least technically, I was bankrupt.

The story, however, had a happy ending. I quickly sold the film rights to a Hollywood studio (footage was used in *Hellfighters — the Red Adair Story*). I negotiated to take over full liability for putting out the fire in return for a larger interest in the well and its surrounding acreage. I made a quick sale of an interest in the trend acreage I was purchasing. I successfully defended against the reservoir damage claims by offset lease holders and settled with the insurance company. By using the proceeds from the movie company and the sale of interest in the trend acreage, I was able to pay Red Adair a deposit and to film him putting the fire out. I also settled the costs associated with the blowout and cleanup, and met my 30-day draft obligations on the new acreage.

All of this taught me, at the young age of 26, that it is often difficult to distinguish between a problem and an opportunity, that quick and decisive action normally pays huge dividends, and that nothing much of value is ever obtained without exposing oneself to large risks and suffering the added insult of both stupidity and failure if things don't work out as planned.

The field that was discovered by that blow-out was the Kitty Field, and it led to a string of other discoveries in the Muddy Play of the 1960s in the Powder River Basin.

Admittedly, in this case I was lucky, but it was a series of events and decisions that has had a profound

long-term effect on me throughout my business career.

My advice

That portion of the oil business which is best defined as being “an independent oil and gas operator” is certainly considered to be a high-risk endeavor. These risks can be mitigated by the normal things — hard work, plenty of preparation, surrounding yourself with people who are smarter than you, and a normal portion of leadership skills. But at the end of the day, remember this — most things you do will fail, and psychologically, you must be mentally prepared for it. It is simply a matter of statistics. There will be a lot more dry wells than there ever will be productive wells. The most important advice I can give you is this: Always remember it is not failure that keeps people from accomplishing great things. It is the fear of failure that stops them.

Bruce Appelbaum

Career history

Born 1947

1969	B.A., geological sciences, SUNY/Buffalo
1971	M.S., geological oceanography, Texas A&M University
1974	Ph.D., geological oceanography, Texas A&M University
1974–1977	Sun Oil Company
1977–1978	Superior Oil Gulf of Suez: Alma Field
1978–1981	Texas Eastern Exploration
1981–1984	SEDCO Energy
1984–1989	Champlin/Union Pacific Resources Gulf of Mexico H.I. 178
1989–2002	Texaco, Inc. Nigeria: Agbami, Nnwa, Aparo Brazil: BS-4 Trinidad: Dolphin Deep, Starfish Gulf of Mexico: Petronius, Champlain, Tahiti Partitioned Neutral Zone: Humma

My proudest accomplishments

- Raising a productive, healthy family.
- Successfully participating in the opening of the deep-water Gulf, Nigeria, and Brazil.
- My career highlight was unquestionably my tenure at Texaco, when I was hired as offshore Gulf of Mexico exploration manager and retired as a corporate vice president and president of worldwide exploration and new ventures. Groups under my direction found 3 billion barrels of oil equivalent in a four-year time frame, all in an ultraconservative environment. The company had endured years of exploration failure and monetary waste prior to our success.

My biggest disappointment

Watching the continuous downsizing of the oil and gas business.

Anecdotal story

My anecdotal story concerns my interview process and the value of persistence when you are convinced that you are correct. During a series of preemployment research interviews in 1989, I was asked generally about my exploration philosophy and views toward improving Texaco's position relative to its peer companies. I waxed enthusiastic about the importance of

petroleum systems and technological advances. I explained the coming importance of deep-water exploration, at which point I was stopped cold and told categorically, "Texaco does not do deep water."

I found this to be a curious statement and probed for the reasons. All were related to emotions following initial failures rather than to hard data and sound science. I accepted the viewpoint and accepted the job, but was fully determined that it was up to me to move the company outside its narrow view if it was to succeed in changing its results. The company had excellent people and resources but was limited in its vision.

My most important task was establishing a drilling portfolio, quantifying its risk, and translating the probable outcome to an upper organization that was accustomed to failure.

Many trips to White Plains and a sound plan produced the proper result. During the process, however, numerous memos were sent to our office, outlining the success of others. This only served to strengthen our resolve. Our persistence was rewarded, but it took four years of patience to acquire high-grade risk and execute the portfolio, which vindicated our plan. The company was initially stunned (confused) by our success. In fact, there was great reluctance initially to ask for funds to delineate our initial successes. Asking for more money in any context seemed to be viewed as fiscal irresponsibility, even if it was meant to confirm a success!

It takes great fortitude to change a culture. All of the foregoing highlights the need for persistence to accomplish anything, in this business or any other.

My advice

Do what you enjoy and be persistent. Keep learning!

Acknowledgments

I am indebted to many individuals who helped to guide my path through academia and my professional career. I feel a kinship with all earth scientists, but a special few provided the mentoring and inspiration that deserve special thanks.

In particular, I want to recognize Arnold Bouma, Bill Bryant, and Dick Rezak for their help during my years in graduate school at Texas A&M's Oceanography Department.

Three special individuals from my professional career are acknowledged as well. All three taught me that success can coexist with humanity, and that character is the most important attribute in any career. The first two are Fred Christian and Phil Raveling, both deceased and sorely missed. The third is Bill Wallace, a friend and true leader.

Robert J. Ardell



Career history

1940	Born in Hinsdale, Illinois
1962	B.A. degree from Monmouth College, Monmouth, Illinois, in geology/economics
1965	M.S. degree from Kansas State University, Manhattan, Kansas, in geology
1965–1971	Union Oil Company of California, Houston and New Orleans
1971–1974	Clark Oil Producing Company, New Orleans and Houston
1974–1977	Kerr-McGee Corp., Houston
1977–1990	Samedan Oil Corporation (Noble Energy), Houston
1990–2002	Nippon Oil Exploration USA Limited, Houston

My proudest accomplishments to date include the following:

Professionally, I suppose I am proudest of having the desire and ability to practice the unconventional. For example, in 1977, I left a perfectly good and promising regional manager's job at Kerr-McGee Corp. to strike out on a plan, as a consultant, to initiate and farm out acreage from the majors in the Gulf of Mexico and cause drilling by Samedan and others on these ideas. Although farm-out activity had long been common in the Gulf of Mexico, never had a program been established by one person as a growth plan for a company. With the incentive of an override, the project of getting

Samedan growing in the Gulf of Mexico was quite successful.

After my 13-year tenure at Samedan, most of the low fruit seemed to have been harvested on the Gulf of Mexico shelf. Clearly, many new discoveries have been made in recent years and new technology has helped to maintain reasonable success ratios, but reserve size has been a problem.

Feeling that the earth was becoming smaller and smaller with rapidly improving technology and communication, I chose to move to a more global-scale project. Nippon Oil, the largest Japanese oil-refining company, expressed a desire to make an attempt at establishing itself in the western hemisphere as an upstream entity. I decided to join in this effort and organized, staffed, and slowly built a "small American independent," Nippon Oil Exploration USA Limited.

This was a significant effort for me and for the Japanese, and a challenging one in light of the stagnant Japanese economy of the 1990s as well as the profound cultural differences between East and West. The U.S. affiliate established many firsts for the company and is now a profitable organization contributing to the corporate balance sheet.

NOEX USA manages interests in the Syncrude project in Canada as well as projects in Venezuela, the U.S. Gulf of Mexico shelf and deep water, and onshore Texas.

Both the Samedan and Nippon projects required unconventional thinking and personal initiative, and both projects provided a feeling of accomplishment for me.

My biggest disappointment is really difficult to determine.

Enjoying my work and creating wealth for many people make any business disappointments seem insignificant. I can't really say I have had "a biggest professional disappointment."

Anecdotal story

Like most people whose histories are included in this book, I have anecdotal stories about trying to sell a deal 20+ times only to drill it without partners and (1) finding a large gas field and (2) drilling a dry hole. I also have stories about not quitting on a deep, expensive wildcat, with similar mixed results. One project stands out as a spectacular success for my company. After drilling in a very tough environment in Eugene Island with several sidetracks and terrible cost overruns, we drilled ahead and found a 200-BCF field! But to add balance, I remember a deep well in Main Pass that only got worse, and the deeper we drilled, the more the cost overruns accumulated.

I have to say my story might be the story of “my proudest accomplishment.” Don’t be afraid of moving away from the herd if you feel you have thought through the options. Some of life’s greatest opportunities and most stimulating challenges lie over the hill just beyond the horizon. Failure might result, but it is seldom fatal. Some level of risk stimulates everyone.

My history of moving from large company to small independent to large company to independent to an Asian bureaucracy as difficult as any represents my idea of challenge and growth. This diet of change has stimulated me in my work and productivity. Regular repotting within the organization or without should improve your contribution to the industry.

My advice

Be open to new opportunities and new ideas. Maintain a satisfactory skill level, which is no small task with the rapid changes in our industry. Practice the highest ethical principles, and have fun. People who enjoy their work do good work. If work ceases to be fun, move on to something or someplace different.

Enjoy and learn from your fellow professionals. You are fortunate to be working with perhaps the best comrades in any industry.

Acknowledgments

No one travels far in this business without support and help along the way. Many could be acknowledged, and here are just a few: Atake, Barclay, Beck, Hooker, Jobe, Mcgee, McKenny, McLeod, Moore, Noble, Ratcliff, Skelly, So, Wills . . . and others have profoundly influenced my professional life either through philosophy, education, or facilitating and supporting my efforts. Little is possible without support, mentoring, wise counsel, and advice.

My apologies to the many I have omitted.

William J. Barrett

Cherry Hills Village, Colorado



Career history

Born January 9, 1929

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| 1956 | B.S. in geology, Kansas State University |
| 1958 | M.S. in geology, Kansas State University |
| 1958 | El Paso Natural Gas stratigrapher, Research Lab, Rocky Mountains |
| 1962 | Pan American (Amoco) project geologist, Rocky Mountains |
| 1966 | Wolf Exploration/INEXCO, chief geologist, Rocky Mountains, part of a team that discovered a 4+ TCF Maddon Field, Wind River Basin, Wyoming, and 200+ million BOE Hilight Field Complex, Powder River Basin, Wyoming |
| 1969 | B & C Exploration, president/partner, consultant |
| 1970 | Rainbow Resources, vice president; exploration manager, director, part of a team that discovered Red Wing Creek, Centennial, acquired, developed Medicine Pole Hills/Coyote Creek, other fields in Williston Basin, North Dakota, 4 MM gross acres under lease in the Rocky Mountains |
| 1978 | Sold Rainbow Resources Corp. to the Williams Companies of Tulsa, Oklahoma |
| 1978 | Sole proprietor, 200+ BCFE field extension of Wattenberg Field, D-J Basin, Colorado |
| 1981 | Barrett Energy Company, private, |

- founder, chief executive officer, chairman, exploration geologist
- 1983 Barrett Resources Corp., public, NASDAQ, NYSE (1994), president, chief executive officer, chairman, exploration geologist
 Discovered and developed 1.2-TCF Parachute–Grand Valley–Rulison Field ult. ± 4TC gas field, Piceance Basin, Colorado
 Discovered and developed 500-BCFE Cave Gulch Field, Wind River Basin, Wyoming
 Developed 4+TCF Powder River Basin coalbed methane development, Powder River Basin, Wyoming
 IP Barrett Resources Corp. was sold to the Williams Companies of Tulsa in a transaction valued at \$2.8 billion
- 2001 Traveled extensively worldwide
- 2002 Formed Bill Barrett Corp., private E&P company with focus on the Rocky Mountains; chief executive officer, chairman

A few of my proudest accomplishments were:

One of my proudest accomplishments was being involved with successful companies such as El Paso, Pan American/Amoco, INEXCO, and Rainbow, culminating with formation of and growth of Barrett Resources Corp. from 1981 to August 3, 2001, when the company was sold to Williams Companies, Inc.

Historical track record of Barrett Resources Corp.

Company	Private ('81-'83)	NASDAQ ('83-'94) NYSE ('94-'01)
Employees	7	265
Daily production	0	341 mmcfe/d
Proven reserves	0	2.1 tcf (8 TCF probable, possible)
Capital budget	0	\$423 MM
Stock value	\$0.38	\$ 73.32/share

Another accomplishment was being a key part of several exploration teams that discovered and developed five giant or near giant oil and gas fields and numerous other smaller oil and gas fields in the Rockies. I was proud of participating in true company-maker projects.

In 2002, at age 73, I jointly formed Bill Barrett Corporation, a new Rocky Mountain E&P company,

with several of my prior colleagues and raised \$282 MM of private equity start-up capital.

My biggest disappointments were:

I have not had much disappointment — lots of ups and downs with pricing, and onerous environmental and regulatory requirements, but that's the way of doing business today.

One disappointment occurred in 1986, when oil and gas prices dropped and we had to downsize. This was the only time it happened. It was a difficult and very unpleasant experience.

Experiences in drilling dry holes on very high profile, "can't-miss" prospects were all big disappointments at the time, but as an explorationist, you drill dry holes, learn, and move on.

The Cave Gulch 1-29 blowout flowed more than 100 MMCFG per day for months. The rig burned down, and we lost an estimated 20 BCF gas while getting the well under control. The good news was that no one got hurt.

An anecdotal story

There are so many stories in my 45-year career that it is difficult to select one. Barrett Resources Corporation was well known for its success in the Piceance Basin. In 1983, when we first started to assemble this project, the area was considered to have very poor to no potential by most people in the industry. In their view, the basin had very poor, tight, reservoir rock and lots of shows, most of the production was marginal, terrain was rough, costs were high, gas markets were poor, etc. The Piceance was simply considered to be a very poor place to explore for and develop hydrocarbons.

I had previously had the opportunity to work in most of the Rocky Mountain basins. I saw the Piceance as a virtually unexplored basin with a large gas-saturated Cretaceous section. Rocks of the same age were commercially productive in all of the surrounding basins. For many years, the central portion of the basin was not drilled because of oil shale development. I recognized the possible potential for a basin-centered gas trap similar to the prolific San Juan Basin Fields to the south.

In 1983, we proceeded in assembling a 45,000-acre lease position with no competition and drilled an initial five exploratory wells. Four wells were successful. With the help of new massive frac technology, we proceeded to develop the now 2+ TCF Parachute–Grand Valley–Rulison gas-producing complex. By July 2002, this complex was producing approximately 160 MMCFGE from 400+ wells with an ongoing five-well drilling program.

My advice to you:

The oil and gas exploration and production busi-

ness is an exciting profession where you, individually, can make a difference. There is none like it. The people you work with are the best you can find anywhere.

Become an expert in your field, focus on your area of expertise, rely on your own geology, draw your own conclusions, think outside the box, utilize all the new available technology, be optimistic.

Look for new opportunities — they are out there. Grow via the drill bit — it's more fun than acquisitions. Enjoy your work, and have fun!

Once you achieve experience, don't be afraid to do your own thing.

Richard S. Bishop



Career

Born 1945

1967	B.S. in geology, Texas Christian University
1969	M.A. in geology, University of Missouri, Columbia
1969–1971	Development geologist, Union Oil Co. of California
1974	Ph.D. in geology, Stanford University
1975–present	Exxon in its many forms
1975–1981	Exxon Production Research Co.
1981–1984	Exxon USA Exploration
1984–1986	Exxon USA Production
1986–1992	Esso Exploration/ Exxon Production Research
1992–present	Exxon/ExxonMobil Exploration Co.

My most significant accomplishment was:

Recognizing that traps are full to either a leak point or spillpoint. The implications were several, e.g., (1) it opened the field of secondary migration and showed that we must evaluate prospects on the basis of leaks, (2) it added another control of gas versus oil (i.e., gas displacement of oil), and (3) it showed that source-rock productivity overwhelmed trap capacity and that prediction of trapped volumes required one to find the smaller of source-rock productivity or trap capacity. It changed the way we mapped and risked prospects.

This discovery was made independently of but after Shell discovered the same/similar thing.

My biggest disappointment was:

Nothing really comes to mind ... but I am still chagrined about a 1982 farmout of some acreage in the offshore Texas state waters. I was new in the job and simply went along with what was on the books — the prospect was too small for us. In reality, it was not risked properly, compared to our drillable prospects. At that time, we did not appreciate the difference in chance of success of a (small) four-way closure versus a (very large) fault trap.

Anecdotal story

My biggest kick of discovery occurred by explaining some well-known observations quite differently than in the past. This meant that some widely used concepts — or perhaps presumptions — were not correct. Arriving at these conclusions, however, was not straightforward and not without doubt, and presenting them was not without pain. I learned that altering presumptions is hard. Folks who had used the established concepts in their exploration habits did not seize on change with open arms.

Early in my Exxon career, I was part of a group responsible for building various yardsticks to increase consistency in prospect assessments from all over the world. My task was to develop a yardstick on percent trap fill. At that time, it was thought that most prospects were underfilled and that source-rock productivity limited the amount of trapped hydrocarbons. Some traps were full to spill, but such full traps were thought to be the exception, not the rule. Furthermore, at that time, we did not know what controlled gas/oil, oil/water, or gas/water contacts.

A different way to look at the question was to measure fill in three dimensions. Prior workers generally had few detailed field maps, and percent trap fill commonly meant a 2-D ratio of field area to the synclinal area. Looking in 3-D required one to find the detailed field maps and, if possible, to identify what controlled the location of the hydrocarbon contact.

This I did. I looked at hundreds of fields in 3-D and discovered that hydrocarbon contacts commonly coincided with the syncline and also were especially common with reservoir-to-reservoir contacts (now commonly called cross-fault leakage).

The implications were significant to both prospect mapping and to predicting oil versus gas. It meant that the limit of trap fill was not source-rock productivity but trap integrity, which meant that we had to

assess prospects in three dimensions rather than two. In addition, it meant that source-rock productivity typically overwhelmed trap capacity rather than limiting the amount of trapped hydrocarbon. There was a corollary that meant gas displacement of oil was an important control in predicting oil versus gas. This expanded our tools in predicting oil versus gas beyond LOM and source-rock type to include volumetrics of productivity and trap volume.

I was fortunate to work with some outstanding scientists, especially Al Young and Dave White. Al was the geochemist who developed the source-rock yield and LOM models, and Dave was the lead assessor. As the data came in, I would plot them up, stew on them a while, and then talk to Al. We would have marvelous dialogues about the meaning of it all. When it came time to report to Dave, he recognized and appreciated the major change in the conceptual basis for much exploration, but also recognized that it meant major changes to the way we assessed prospects.

My advice to you is:

Wise persons can tell the difference between advice and personal opinion. I generally try not to give advice — folks usually know what they want to do or ought to do.

Try to ask questions differently or do data acquisition differently than has been done previously.

Acknowledgments

The key influences in my career were twofold: One influenced my process of thinking, and the other changed my career responsibilities. Neither taught me tools of how to do something but, unknown to them, these folks changed the way I thought about and did things. It is helpful to me to name them.

In terms of career influence, Mike Johnson of ExxonMobil, John Harbaugh of Stanford University, and Bill Bishop (no relation, but a past president of the Houston Geological Society) provided support at decision points in my career. Mike, John, and Bill all know, and are greatly appreciated for, the roles they played in influencing my career.

In terms of problem solving, the folks who left a lasting impression are Al Young at Exxon Production Research Company and Jim Lewis, past president AAPG. Both listened and listened and listened, asked a few questions, and said a few words which led me to the great “Ahhhaaa! I’ve got it!” event.

Daniel A. Busch

Petroleum consultant, Tulsa, Oklahoma



Career history

Born 1912

- 1934 B.S. degree in chemistry, Capital University
- 1936 M.A. degree in geology, Ohio State University
- 1939 Ph.D. degree in geology, Ohio State University
- 1938: Instructor of geology, University of Pittsburgh
- 1942 Geologist, Pennsylvania Geological Survey
- 1943 Consulting geologist, Huntley & Huntley
- 1946 Senior research geologist, Carter Research Laboratory
- 1949 Staff geologist, Carter Oil Co.
- 1951 Exploration manager, Zephyr Petroleum Co.
- 1954–1992 Consulting geologist

Part-time teaching positions, visiting professor, University of Tulsa, Oil and Gas Consultants, International

My proudest accomplishment was:

Numerous oil and gas discoveries in Ohio, Oklahoma, eastern Kansas, the Rocky Mountains, and Mexico, and receiving the Sidney Powers Gold Medal

My biggest disappointment was:

Neither of my two sons chose geology for a career.

An anecdotal story

I generated a “hot” prospect for oil and gas, sat on the well continuously for three days and nights, and had to plug it as a dry hole. When I reached home at 3 a.m., it was necessary to awaken my wife to unlock the front door. After she greeted me with a kiss, I asked her if she might be interested in knowing the outcome of the drilling of my favorite prospect. She replied in the affirmative, and I replied, “It was a dry hole!” Her reply was simply, “Better luck next time.” Because there was no expression of sympathy for my failure, I then posed the following question. “Do you realize you could have replaced every piece of furniture and carpeting in our home with new furnishings with the amount of money I spent on my working interest in that dry hole?” Her reply was, “You will do better next time.”

My advice to you is:

Geology students who intend to pursue a career in petroleum exploration should complete one or two years of graduate studies in geology and geophysics before seeking employment. After several years of employment they should periodically enroll in special courses, such as those sponsored by the AAPG and the industry. This is the most effective means of succeeding in a highly competitive industry.

A. T. (Toby) Carleton

Midland, Texas



Career history:

Born March 5, 1929, Houston, Texas

1951	B.S. degree in geology, University of Texas at Austin
1952	M.A. degree in geology, University of Texas at Austin
1952–1955	The Ohio Oil Company (now Marathon), Midland, Texas, and Roswell, New Mexico
1955–1961	Zapata Petroleum Corporation, Midland, Texas, chief geologist
1961–1963	Independent geologist, Midland, Texas
1963–1976	Structurmaps, Ltd., Midland, Texas, general partner
1976–1979	Independent geologist, Midland, Texas
1979–1989	Pogo Producing Company, Midland, Texas, vice president
1989–1991	Tocor Exploration (representing Energy Exploration Management on contract to Canadian Hunter Exploration, Ltd.)
1991–present	Tocor Investments, Inc., and Tocor Exploration, Midland, Texas, president; Imperial Operating Company, LLC, Midland, Texas, member

My proudest accomplishment was:

My proudest accomplishments have to do with the professional societies that I have served, at the local, national, and international levels. I have been president of West Texas Geological Society, chairman of the

Midland Chapter of SIPES, chairman of the AAPG House of Delegates, president of SIPES, and president of AAPG. Although I have been at least partly responsible for several oil and gas discoveries and developments, the contacts and networking that I made through these professional organizations are the things that have been most important to me in my career.

It is through these associations that I have met people from all over the world who are not only my friends, but have in many cases contributed to whatever successes I may have achieved.

My biggest disappointment was:

My biggest disappointment occurred fairly early in my career. I was fired from a job that I really liked. I was so devastated that I stayed in bed for three days. This, however, turned out to be the best possible thing that could have happened to me. It strengthened my resolve and focused my direction. Had I not been forced to go out on my own in a time of high unemployment in our industry, I would probably, at best, have retired as a staff geologist for a medium-sized oil company.

As it was, I was forced into becoming an entrepreneur, formed several successful businesses, consulted for multimillion-dollar companies, became vice president of a large aggressive independent exploration company, and am currently dividing my time between the oil and gas business and ranching. I am content with my position in life.

An anecdotal story

Back in the early 1960s, I turned a deal which resulted in a good Devonian gas discovery. There was, however, no market for the gas at that time in that place. Subsequently, things got really bad for me and I wasn't sure I was going to survive in this business. My wife and small children had gone to visit her parents for the Christmas holidays. I was to join them on New Year's Eve. I had already decided that I must tell my wife that we were going to have to find another way of making a living.

On New Year's Eve, I got a call from Bill Liedtke, who was to become president of the Pennzoil Company, which was then being formed. They were acquiring various entities to put into the new company, and were looking to purchase properties for this purpose before the end of that year. Bill asked if I still had my interest in the shut-in gas well. As it turned out, they bought my interest in that well for several thousand dollars. It bailed me out and allowed me to continue in the business that I love. It was also the best New Year's Eve that I ever had.

As a side note, I saved out some of the acreage on

this prospect, which later proved to be productive also. I am still receiving income from this prospect more than 40 years later.

My advice to you is:

My advice to anyone not already so doing is to get involved in your professional society at any level. In addition to the contacts and networking referred to earlier, the continuing educational opportunities offered by all these organizations afford the geoscientist the avenue to stay abreast of technological advances.

Another word of advice is to be persistent. Don't give up. Sometimes it is darkest right before the dawn. That is the moral of my anecdotal story.

Acknowledgments

Many people have had a positive influence on my professional career. A few of those I would like to acknowledge are listed here. George H. W. Bush and Hugh Liedtke, at Zapata Petroleum Corporation, taught me the business side of the oil business. Bill Liedtke not only saved my career, but was a guiding influence in it. Bill Gipson was my boss and mentor and has been my friend for more than 50 years. Harry Miller has been my friend and has helped me to survive during tough times. Bruno Hanson was my mentor and my dear friend. My wife, Corinne, has stood by me and encouraged me "for better or for worse" for the last 50 years.

Robey H. Clark

Geologist, Amarillo, Texas



Career history

Born 1921, Mound, Madison Parish, Louisiana

- | | |
|--------------|---|
| 1943 | B.S. degree in geology, Louisiana State University |
| 1943–1946 | U.S. Navy, Pacific Theater, served on LSTs 220, 242, 451 |
| 1946–1947 | Geologist, Magnolia Petroleum Co., Oklahoma and New Mexico |
| 1948 | Married Marjorie Joanne Justus; four children, seven grandchildren |
| 1949 | M.S. degree in geology, University of Wisconsin at Madison |
| 1949–1971 | Magnolia Petroleum Co. and its parent, Mobil Oil Corp., Gulf Coast, Midcontinent, Rocky Mountains, etc. |
| 1971–1982 | Diamond Shamrock Corp., Amarillo, Texas (all of the United States plus the North Sea and marine areas of Australia and New Zealand) |
| 1982–1990 | Independent consultant, various clients |
| 1992–present | Over-the-hill bystander interested in sources of energy to year 2100 attempts to reclaim our nation from the bureaucracy. |

AAPG secretary, 1977–1979; president, 1980–1981; honorary member, 1985; member DPA, EMD, DEG

My proudest accomplishment was:

Successful association with Gulf of Mexico offshore, 1948–1982.

My biggest disappointment was:

The merger craze.

An anecdotal story

In March 1943, when I was two months shy of graduation at LSU, the U.S. Navy called me into service. In September 1943, I went to war on an LST in the Pacific.

In March 1946, I debarked in San Francisco. While awaiting transportation to Louisiana, I applied for work at Standard Oil of California. A vice president interviewed me. At the close, he said he could offer me an entry-level job, but added that Standard of California was clannish, and promotion was slow for geologists from schools outside the West Coast. He suggested I go home and look for work in the Gulf Coast, and if that failed, get back to him. I was pleased, but puzzled by “Yes, we have an opening, but you wouldn’t like it.” It was my first lukewarm welcome.

Back in Louisiana, I borrowed a car and headed west on U.S. 80. While still miles from Dallas, I spotted the red Pegasus atop the Magnolia building. The next day, I knocked on Magnolia’s door. Soon I was received by a high-ranking exploration executive — the first of several in a long day of interviews. At day’s end, they said Magnolia would like to hire me, but they had to consider former employees still in service. They suggested I interview in the busy city of Tulsa, Oklahoma, and if nothing turned up, come back to see them. Puzzled at my second lukewarm welcome, I drove to Tulsa.

At nine next morning, I called on Sinclair Oil. A soft-spoken, elderly gentleman interviewed me at some length. He said he would like to have me in Sinclair but suggested that I try elsewhere, and if nothing turned up, come back to see him. Disappointed, I asked why he preferred that I work for someone else. I was startled and puzzled to hear him imply that I might not feel comfortable in the business culture at Sinclair. He did not elaborate. It was a lukewarm welcome with a twist.

I applied at Carter Oil. Its vice president was a truly large man with a hearty manner and a booming voice.

After some talk, he asked if I drank whiskey. Very carefully, I said, “Well, yes — sometimes — a little.”

“That’s good to know,” he said. “It’s a funny thing, but I just can’t really trust a man that won’t take a drink.” In due course, he said he could offer me a job on a geophysical crew, but it wouldn’t be ready for a month or two, so try elsewhere and check back in a few weeks ... another lukewarm welcome.

At Skelly, I interviewed with a quiet, scholarly gentleman who said they would be starting a surface geology field party in about a month and he could put me on at a beginner’s wage. If I was interested, he would call me when the work began. It was yet another iffy lukewarm welcome. I tried a couple of more companies and gave up.

I returned to Dallas and went back to Magnolia. Glory be! They actually hired me at about \$225 a month and assigned me to Oklahoma City. When I reported on May 1, 1946, district geologist Dr. Walt Moreman said I was just in time to change to field clothes and go sit on a well with an ex-navy guy named Ken Keller.

Many years later, I asked Dr. Henry Cortes, one of the Magnolia executives who interviewed me, why they had offered me a job. He reminded me that on the application, there had been a question asking what I hoped to accomplish in the next two years. My answer was to get a good job and get a wife. Cortes then asked if I had a girl. I answered, “Not yet.” Cortes liked my answer. He said he figured I’d be good at setting worthy goals and making good things happen. Anyway, Magnolia and I had 25 good years together ... and I still have the girl!

My advice to you is:

Just do the right thing.

Acknowledgments

In my career, I am indebted to a host of geologists and nongeologists, but two stand out — Carlos Ferguson, who patiently helped me return to civilian life as a geologist in 1946, and Philip Jennings, who taught me a sense of scale in exploration, and the enormity of exploration and producing potential in the Gulf of Mexico and all over the world.

Robert D. (Bob) Cowdery

Consulting geologist, Wichita, Kansas



Career history

Born August 20, 1926, Lyons, Kansas

1944–1946	Military justice specialist, technical sergeant
1946–1949	B.S. in physical science, geology major, Kansas State University Additional coursework, Denver University, University of Colorado, Colorado School of Mines, and Wichita State University (230 hours total credit)
1949–1951	Geologist, Cities Service Oil Co., Oklahoma City, Oklahoma, and Great Bend, Kansas
1951–1988	Petroleum, Inc.
1951–1953	Staff geologist, Wichita, Kansas
1953–1956	District geologist, Denver, Colorado
1956–1967	Division geologist, Denver, Colorado
1967–1975	Rocky Mountain exploration manager, vice president, Denver; explored in all major basins of the Rocky Mountains (United States) plus Canada
1975–1985	Exploration manager, vice president, Wichita, Kansas; responsible for exploration in 11 states
1985–1986	Executive vice president, chief operating officer
1986–1988	President, chief operating officer
1988	Director of exploration
1988–present	Consulting geologist, Wichita, Kansas

Accomplishments

I commenced martial-arts training when I was 42 years old and have continued to the present. My proudest accomplishment is achieving the rank of Sixth Dan (sixth-degree) black belt and remaining active at the age of 75 years — this despite the fact that my athletic ability is limited.

My biggest disappointments were:

Even though I continued my education for a long period after receiving my B.S. degree, I did not persevere to the point of obtaining any advanced degrees, although I had 59 hours of anthropology and 39 hours toward an M.B.A.

I failed to find nearly enough reserves of oil and gas for my company with the high number of exploratory tests that the company drilled.

An anecdotal story

My story deals with an example taken from a presentation that I make, called “Mistakes I Have Made.” Our company secured a half interest (later increased to a three-quarter interest) in a prospect in Renville County, North Dakota. The exploratory technique was simple. We drilled in an indicated updip direction from an abandoned test with extremely good shows of oil, but it had been overperforated and produced water. After the discovery, we drilled some excellent development wells (many of these wells have subsequently made more than 1 million barrels of oil apiece).

As the field developed, I prided myself on understanding the trapping mechanism, which was a facies change from a porous limestone to an argillaceous zone across a structural nose. What I didn’t realize was that this was a very complex depositional and structural area, possibly involving two episodes of salt collapse. On the other side of my perfect barrier were two more fields just as good as the first one. These fields straddled the border with Canada, and our company had only one producer in the two fields.

Downdip from our discovery was a lease on which the company had moved a rig and was preparing to spud. I had the location abandoned because I thought the test to be drilled would encounter the Sherwood (Frobisher-Alida) pay zone below the oil-water contact. What I didn’t realize was that the 29-gravity oil had been tilted because of the hydrodynamics of the area downdip. The operator who later drilled the lease obtained two excellent wells. These mistakes all resulted from my being “too damn smart” and thinking I understood the geology when I didn’t.

My advice to you is:

If you are a practicing geologist, stay with what you

are doing. I write profiles on geologists more than 70 years of age. I have written more than 80 of these profiles. One question I ask is, "If you had it to do over, would you still be a petroleum geologist?" With possibly one exception, they have all said, "Why, certainly, there isn't anything better than this" or words to that effect.

To the student or newly graduated geologist entering the field, I would say, "Don't get 'too damn smart' — you may not have all the answers."

Marlan W. Downey



Career history

Born 1932, Falls City, Nebraska

1952	B.A. degree in chemistry, Peru State College
1952–1954	U.S. Army service in Korea
1954–1957	B.S. and M.S. degrees in geology, University of Nebraska
1957–1987	Shell Oil Company
1963–1967	Project manager, research, origin and migration of hydrocarbons, Shell Development
1967–1973	Chief geologist, western region
1973–1977	Alaska Division, exploration manager
1977–1979	Vice president, international exploration
1979–1987	President, Pecten International; retired 1987
1987–1990	Formed Roxanna Oil, consulted and explored worldwide
1990–1996	Arco International, senior vice president of exploration, president; exploration adviser to the Arco board; retired 1996
1996–2000	Bartell Professor and Chief Scientist, Sarkeys Energy Center, University of Oklahoma
2000–2001	President of AAPG
2001–present	Senior Fellow at the Institute for the Study of Earth and Man, Southern Methodist University, Dallas

Summary: I supervised exploration and development investments in 62 countries. Teams found and developed commercial fields in 20 countries. Six countries yielded more than 1 billion barrels equivalent.

I organized and chaired the first Hedberg Conference on “Seals for Hydrocarbons” in 1984, the first Hedberg Conference on “Understanding Risk in E and P” in 1993, the fifth conference on “Unconventional Methods of Exploration” in 1998, the second Pratt Conference on “Future Petroleum Provinces” in 2000, and the first AAPG Conference on “A National Energy Policy” in 2000.

I have published scores of articles and two books, was selected twice as AAPG distinguished lecturer, and was honored by the Houston Geological Society as a “Living Legend in the Oil Business.”

My proudest accomplishment was:

Being successively chosen as president of Pecten International, president of Arco International, and president of the American Association of Petroleum Geologists.

My biggest disappointment was:

I think I have learned more from my failures than from my successes. My largest failure was in the Gulf of Alaska frontier sale. Shell/Arco bid heavily on prospects, won the tracts, and found the tracts barren after drilling.

This was the first major sale in which I was in charge. I think I did a good job of assembling a team, focusing effort on key issues, and assuring that the technical and business effort was coordinated and completed by the sale date.

What did I do wrong? When I reviewed the work of the geophysicists, I found that they were very confident that subtleties in the data indicated an oil charge in the Gulf of Alaska reservoirs. My geophysical team gave me a written recommendation emphasizing their confidence about the oil charge to the prospects. I could not see the anomalies that they were confident really existed. I bowed to their judgment.

What did I learn? I learned that if I couldn't see an anomaly, if I couldn't understand a presentation, then that anomaly probably wasn't valid and that technical presentation probably wasn't correct. I learned that the company pays big bucks for my judgment, not the opinions of my staff. That's why the job of the senior manager can be a lonely one. The hard decisions are those when you must overrule your staff and have confidence in your own judgment.

I keep a framed seismic section from my Gulf of Alaska prospect hanging in my garage. Each time I enter my home, I am reminded of my imperfection and failures.

I learn from failure.

My advice to you is:

Make sure you love your job. Think what an advantage you will have over anyone else if your favorite reading material is from your chosen field. Think how blessed you will be if your time at work is personally rewarding and enjoyable. I have always remembered a horrifying quote — “The mass of men lead lives of quiet desperation.” Don't be one of the masses.

Acknowledgments

I've been greatly helped along the way, and I hope I can thank my living mentors every day. In tribute to those who have passed on, perhaps I can encourage others to remember R. E. McAdams, Tom Hart, Barney Wilson, “Boo” Bernard, George Thompson, and Archie Hood.

William L. Fisher



Career history

- 1954 B.A. in geology, Southern Illinois University
- 1958 M.S. in geology, University of Kansas
- 1961 Ph.D. geology, University of Kansas
- 1986 D.Sc. (honorary), Southern Illinois University
- 2002 D.Eng. (honorary), Colorado School of Mines

University of Texas, Austin, Barrow Chair and director, John A. and Katherine G. Jackson School of Geosciences

My proudest accomplishment was:

I think it was the opportunity to serve as president of AAPG. During my term (1985–1986), we experienced one of the worst falls in oil and gas prices in history. It was a traumatic time for many of our members, but I was impressed then, and continue to be, by the resiliency shown by my fellow petroleum geologists. I think the professional ties afforded by our geological societies go a long way in providing us this resiliency.

My biggest disappointment was:

There have been plenty, of course. But I try never to dwell on disappointments. I always like Willie Nelson's lines: "Remember the good times. They are fewer in number and easier to recall. Don't spend too much time on the bad times. Their staggering number will weigh heavy as lead on your mind."

Anecdotal story

Like oil and gas exploration, geologic research involves discovery, and that is the thrill of both. A meaningful discovery for me was the development of the concept of depositional systems. In the middle 1960s, I was doing a regional study of the Eocene Wilcox of Texas, generally considered a complex and not well understood stratigraphic unit.

I was not advancing as I liked until I had the fortune to hear two papers at the 1964 GCAGS meeting. One was by Jim Coleman and Woody Gagliano on the Mississippi Fort Jackson boring where they advanced the idea of bounding facies in deltas, and the other was by Don Boyd and Byron Dyer, who presented the then revolutionary idea that the South Texas Frio was a large barrier bar system. These two papers at one meeting really focused my thinking and with some further discussions with the likes of Dave Frazier and Rufe LeBlanc, it all came together.

My advice to you:

Don't be reluctant to expend energy. Use what intellect you may have to its fullest, keep disciplined — and you will accomplish much of what you want to.

Michael C. (Mike) Forrest

Consultant, Dallas, Texas



Career history

Born 1933

1955	B.S. degree in geophysical engineering, St. Louis University
1955–1992	Shell Oil Company
1992–1997	Maxus Energy Corporation
1997–2002	Consultant

My proudest accomplishments were:

From 1968 to 1975, I was part of the Shell Oil team that developed and applied “bright-spot” technology to discover more than 1 billion barrels oil and gas equivalent on the offshore Louisiana and Texas shelf.

From 1984 to 1987, I was in a leadership role on the Shell team that expanded Gulf of Mexico leasing and exploration, drilling out to 6000 feet of water. In the late 1980s, drilling discovered Auger, Mensa, and Mars fields. That was the beginning of a deep-water success story. Shell currently produces 500,000 BOE/day from the deep-water Gulf of Mexico.

My biggest disappointment was:

From 1981 to 1984, I was exploration manager with Shell in very high-cost exploration failures in Alaska frontier lease sales, including the Beaufort Sea and several basins in the Bering Sea.

An anecdotal story

In 1973, Shell drilled an exploration test on the west flank of a salt/share intrusive called Prospect Pine (Gulf of Mexico, SMI 130). Seismic data indicated four

good amplitude anomalies (“bright spots”), but logs showed only three oil pays. Bill Scaife, our senior technology geophysicist, argued that the fourth “bright spot” should be a pay sand and the logs were wrong, whereas our petrophysicist stated that the logs were correct. A twin well was drilled 100 feet from the original hole to core the oil pay sands. Logs from this well showed a good oil pay associated with the fourth “bright spot.”

Lessons:

- Seismic reflections are from an area (Fresnel zone), whereas well-log measurements are from a few inches to a few feet around the borehole (one interpretation of the above example is that the fourth sand is not present in a small area around the location of the original well).
- Both seismic and petrophysical measurements have inaccuracies that must be considered when making interpretations.
- Geoscientists must be persistent if they believe that a new idea or an interpretation is supported by good technical data.

My advice to you is:

- Strive for integrated technical studies.
- Continue to learn.
- Understand the risk analysis of projects that will be included in your company’s exploration portfolio.
- Have fun in your work.

Joe B. Foster

Chairman, Newfield Exploration Company



Career history

Born Arp, Texas, 1934

1957	B.S. in petroleum engineering and B.B.A. in general business, Texas A&M University
Tenneco Oil Company	
1957–1966	Petroleum engineer, Oklahoma City, Oklahoma, and Lafayette, Louisiana; handled bid economics for offshore lease sales
1966–1970	Headquarters staff; Houston, Texas; chief, economic planning and analysis
1970–1974	Vice president, exploration; leadership role in Gulf of Mexico sales
1974–1980	Senior vice president; president, exploration and production; headed worldwide exploration and production
1981–1988	Tenneco Inc., principal energy officer
1989–2000	Newfield Exploration Company, founder and chief executive officer
2000	Baker Hughes Inc., interim chief executive officer
2001–2002	Newfield Exploration Company, non-executive chairman

My proudest accomplishment was:

Founding Newfield Exploration Company in 1989 with \$9 million of equity capital and leading it to become a publicly traded company with more than \$2 billion of market value in less than 10 years.

My biggest disappointment was:

Seeing the company I had spent 31 years with, Tenneco Oil, be broken up and sold in pieces by its parent company in 1988. This was done to pay down debt incurred by another subsidiary — of all things, a maker of farm tractors! A true-value-adding organization was destroyed, and without its energy (and cash flow), the parent company withered away.

A story:

The first three wells we drilled at Newfield were dry holes and one had a capsized rig, resulting in a \$6 million loss which, if that well had not been turnkeyed, would have bankrupted Newfield. We had about \$100,000 in the bank when we made our first discovery. New beginnings are fraught with danger.

My advice to you is:

- Focus your efforts in one or a few geologic provinces or geographic areas.
- Do your homework thoroughly, using superior technology.
- Always do what you say you are going to do.
- Be willing to take risks and obtain lots of exposure.
- Hedge against the downside.
- Live and work on the ragged edge between order and chaos.
- Remember that success and satisfaction almost always involve working cooperatively with other people.

L. W. Funkhouser



Career history

Born 1921

1943	A.B. degree in geology, Oberlin College
1948	M.S. degree in geology, Stanford University
1990	Doctor of science degree (honorary), Oberlin College
1948–1986	Chevron Corporation; final position, corporation director and vice president, exploration and production
1987–1988	President, AAPG
1991–2001	Chairman, AAPG Foundation

My proudest accomplishment was:

Being associated with the Chevron geologists and geophysicists who discovered major new petroleum provinces, such as the Overthrust Belt play in Wyoming, the Deep Tuscaloosa play in central Louisiana, the Hibernia Field offshore Newfoundland, the major oil discoveries in Sudan, and the West Pembina Devonian Reef in Alberta, among others.

My biggest disappointment was:

The dismantling of the highly talented exploration operations and research groups after the oil-price debacle of the mid-1980s.

Anecdotal story

In the early 1970s, Chevron and another company drilled a series of wildcats on the Grand Banks offshore Newfoundland. All were dry holes, but the last

and most northeasterly test found an excellent source rock but no reservoir rocks.

Several years later, Chevron was offered a half interest in several million acres offshore eastern Newfoundland in exchange for a half interest in a 100,000-acre block in the McKenzie Delta. Chevron's subsidiary, Chevron Canada Resources, under the leadership of G.G.L. Henderson, recommended approval because of the source section found in the earlier well. However, Chevron's executive committee emphatically turned down the trade because the Newfoundland acreage was located in "Iceberg Alley."

In the late 1970s, the company holding the offshore Newfoundland acreage had drilled some unsuccessful wells on the block and came back to Chevron with a proposal that Chevron would earn half interest in a 750,000-acre block in return for drilling one exploratory well.

Because of the excellent source section seen in the earlier Chevron dry hole, the proposed trade was again recommended to the Chevron executive committee. Because the company had a long-range commitment on a large semisubmersible and no ready place to use it at that time, the exploration project was approved, despite the fear of icebergs.

Chevron Canada reworked the seismic data shot by the acreage owner and proposed a wildcat location on a large fault-bounded anticline found on the reprocessed data. The well was drilled, and it discovered the Hibernia Field — a billion-barrel field and the first commercial production in a new petroleum province. Hibernia currently has by far the largest daily production of any Canadian Field. If at first you don't succeed...

My advice to you is:

Stay current in the rapidly evolving usage of modern exploration technology. Stay flexible and abreast of geologic applications that can lead to employment opportunities in future economic times. Remember that the search for and discovery of new petroleum resources are still among the most fascinating and productive endeavors available to today's professionals.

Jim Gibbs



Career history

Born 1935

1957	B.S., University of Oklahoma
1959–1960	University of Texas
1962	M.S. in geology, University of Oklahoma
	President and chief executive officer, Five States

My proudest accomplishment was:

Seeing many of the young geologists that started to work in our offices as “professional apprentices” become successful geologists and independents.

My biggest disappointment was:

Finding out that so many geologists are better oil finders than I am.

My advice to you is:

Find a niche in the profession of geology that you really enjoy, and develop your career around it.

Robbie Rice Gries

Priority Oil & Gas Co. LLC, Denver, Colorado



Career history

Born September 14, 1943

1966	B.S. in geology, Colorado State University
1970	M.A. in geology, the University of Texas at Austin
1973	Instructor at Wichita State University and consultant, Texaco Inc.
1973–1977	Geologist, assistant district geologist, Texaco Inc.
1977–1980	Reserve Oil Inc.
1980–1992	Consulting geologist and independent
1992–present	President and chief executive officer, Priority Oil & Gas LLC

My proudest accomplishment was:

Getting my wildest idea (to date) drilled in south-central Colorado. Predicting Cretaceous and Jurassic rocks beneath the extensive San Juan Volcanic field, I used old reports from geologists in the 1950s. Subsequent work by the USGS had predicted that the volcanics instead would overlie directly the Precambrian basement — the accepted dogma in the early 1980s, when I started to develop this subvolcanic exploration project. Oil seeps in the area, which I had sussed out, seemed to obviate the fact that there must be a Cretaceous section, but it was still a difficult concept to sell because of having to buck the dogma of the day.

When we drilled the first stratigraphic test and ran

out of rig before getting through the volcanics, it made the chase even harder. However, that well had more oil shows, which tested to be Cretaceous crude. When the first oil and gas test was drilled, 3450 feet of volcanics was penetrated before we drilled into Tertiary red beds. Another 2790 feet of Tertiary was penetrated before drilling into Cretaceous Lewis Shale and a typical San Juan Basin Cretaceous section.

The second dogma we had to overcome was that even if we found Cretaceous rocks, they would be totally overcooked because of the overlying and penetrating volcanics. The nearby San Juan Basin had an extremely high heat flow that put shallow Cretaceous rocks (2000 feet) into the dry gas window. What were our hopes for oil and wet gas at depths of 4000 to 9000 feet right in the volcanic field? Heresy!

Geochemical analysis after our drilling determined that our Cretaceous rocks were still in the oil window for most of the Sag basin at depths well below the San Juan Basin transition. The San Juan Basin was the thermal enigma, not the San Juan Sag!

An anecdotal story

On occasion when I have been “exploring,” I have had a report or publication that “killed” the prospect. However, persistence and reasonable scientific skepticism sometimes overcame the negative. On two occasions, source-rock geochemistry pointed to “overcooked” rocks and poor potential. I collected new samples and had them run again, sometimes twice. In both areas, we found that the original study was erroneous and the two areas were not “overcooked” at all, but were in the oil or transition window.

On a couple of other occasions, when I was exploring beneath thrust Precambrian, I had publications or reports that said the mountain flank was not thrust-ed, but was uplifted vertically. After promoting new seismic and additional drilling, we established that indeed these mountain fronts were thrust-bound and not vertical. And indeed, they were prospective beneath the edge of the thrust.

My biggest disappointment was:

My biggest disappointment has been in not getting my prospect and well drilled southeast of Jackson Hole, Wyoming. A gorgeous geologic setting — an anticline formed between the thin-skinned thrust belt and the foreland Gros Ventre Mountain thrust — it was at the apex of the Hoback (Greater Green River Basin) migration path for hydrocarbons. Although we had valid federal exploration leases, a court battle with antidrilling groups continued for more than 10 years and the prospect was never tested. This — after I had taken the antipetroleum parties on a field trip

and showed them the locations that had been drilled 25 years previously (they couldn't even see the locations because they had been returned to their original state so successfully).

My advice to you is:

Look where others have overlooked or thought something was condemned. Don't be afraid to buck the dogma. Don't be afraid to be wrong. And trust that you will continue to have new ideas — as long as you keep looking!

Robert D. Gunn

Independent, Wichita Falls, Texas



Career history

Born 1925

1949	B.A. degree in geology, University of Minnesota
1949–1953	The Texas Company (Texaco)
1953–1959	Consultant
1959–1975	Independent
1975–present	Gunn Oil Company

My proudest accomplishment

My proudest accomplishment was receiving the Sidney Powers Memorial award in 1997.

My biggest disappointment

My biggest disappointment was spending five years “in prison” (as chairman of the board for the Texas Department of Corrections), which required nearly all my time, because the prison system was in a phase of reform. During this five-year period, I was unable to stay up with advances in geologic technology, which haunts me to this day.

Anecdotal story

In 1961, the Palo Duro Basin of northwest Texas had no production. I had caused two dry holes to be drilled in Childress County, Texas, searching for production in a Pennsylvanian Canyon reef. The third well on this prospect proved impossible to sell. Therefore, sincerely believing in my work, I stubbornly began to drill the prospect myself, even though I would have to risk my

all. Mr. O. P. Leonard of Fort Worth heard of my effort and responded by saying, “If that young character believes in the thing that much, I’ll take the deal.” We found the first production in the Palo Duro Basin, the Kirkland field.

This income sustained me through very difficult years for our industry. I had, in this period, been trying to lease the 6666 Ranch in King County, Texas. I finally succeeded in January 1969, with the stipulation that I put up \$100,000 earnest money, to be relinquished if I did not sell the deal to a respectable company by August 1, 1969. I tried and tried but could not find partners. The terms were just too tough.

So, strongly believing in my theories and reasoning, I had bet everything I owned, and I was about to lose it. However, with the aid of a friend, Netum Steed, the deal finally sold on July 30, 1969, with only one day to go. The result was the discovery and production of about 150,000,000 barrels of oil.

The point I would like to convey is that if you totally believe in your work, beyond any possible rationalization, consider pursuing your efforts to the extreme — even to the extent of “risking the ranch.” Rather than caution and good sense, the attribute that paid off for me was rational tenacity.

My advice:

Be tenacious.

Alfredo Eduardo Guzmán

Career history

Born 1947

1971 B.Sc., Texas Tech University

1973 M.Sc., Texas Tech University

Employer: Pemex Exploration and Production

My proudest accomplishment was:

To have reached the highest position an explorationist can achieve in Pemex, the Mexican oil company (Exploration V.P.), and in that position to be able to revitalize the exploration of the Tertiary siliciclastics that had pretty much been abandoned after the discovery of a supergiant Mesozoic oil province in the mid-1970s, and recently to be the first geoscientist to occupy an Operations V.P. for one of Pemex's E&P regions (Northern).

My biggest disappointment was:

Not having my father — a petroleum geologist with Pemex for more than 35 years, who passed away in 1989 — to see my accomplishments.

Anecdotal story

My most appreciated anecdotes have to do with people saying that something couldn't be done or that there were no hydrocarbons to be found in a given structure, play, or province where, with time, they were proven totally wrong.

My advice to you is:

To always look ahead, but never to forget to look back to what preceded us.

Michel T. Halbouty



My proudest accomplishments were:

- Being the first independent to explore and wildcat in Alaska, and discovering the West Fork Gas Field on the Kenai Peninsula in 1959, the first discovery by an independent in Alaska
- Being elected as president of AAPG
- Receiving the honorary degree of doctor of geoscience from the U.S.S.R. Academy of Sciences in 1990, and being named honorary professor at the University of Nanjing, People's Republic of China, in 1993

My biggest disappointment was:

I try to learn from my setbacks, not be disappointed by them.

My advice to you is:

Remember your heritage. Many great geoscientists have come before you, and they have much to teach you if you are willing to learn.

Frank W. Harrison Jr.

Consulting geologist and independent
Lafayette, Louisiana



Career history

Born Bastrop, Louisiana

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|--------------|--|
| 1950 | B.S. degree, petroleum geology,
Louisiana State University |
| 1950–1954 | Union Producing Company; 1950,
draftsman and geological scout in
Jackson, Mississippi; 1950–1954, geolo-
gist in New Orleans, Louisiana |
| 1954–1956 | Seaboard Oil Co., geologist in New
Orleans, Louisiana |
| 1956–1957 | Trans-Tex Drilling Co., district geologist
in Lafayette, Louisiana |
| 1957–1959 | American Natural Gas Production Co.,
head geologist in Lafayette, Louisiana |
| 1959–present | Independent and consulting geologist
in Lafayette, Louisiana |
| 1982–present | Optimistic Oil Co., president |

My proudest accomplishments were:

All of the successful oil and gas wells that I have generated and participated in during my career.

My biggest disappointments were:

All of the dry holes that I have generated and participated in during my career.

An anecdotal story

When I was president of the AAPG in 1981–1982, the oil and gas industry was at its zenith of activity and prosperity. More than 4000 rigs were working in the

United States. The AAPG membership was burgeoning, and the demand for geologists was unbelievable. Geologists were demanding salaries comparable to their weight in gold, and many received that compensation. It was the best of times, with oil prices projected to reach \$100/barrel in five years. Naturally, the theme of my presidency was unbridled optimism. Upon my turning over the reins of the presidency, the executive committee gave me a sign as a joke. The sign in bold letters read “Optimistic Oil Company — Frank W. Harrison, President.”

Upon returning to Lafayette, Louisiana, I began to think about that particular company name and its appropriateness for me. First, it totally reflected my attitude of how to explore for oil and gas (a pessimist never made it in this business), and second, Optimistic Oil Company was a name with great industry appeal. I incorporated the name, and Optimistic Oil Company was born in 1982.

My advice to you is:

Never give up. Be optimistic, and drill, drill, drill!

Roy M. Huffington

Chairman of the board, Roy M. Huffington, Inc.
Houston, Texas



Career history

Born 1917

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|--------------|--|
| 1938 | B.S. degree in geology, Southern Methodist University |
| 1941 | M.A. degree in geology, Harvard University |
| 1942 | Ph.D. degree in geology, Harvard University |
| 1942–1945 | Served in the U.S. Navy in World War II (18 months in the Pacific, 15 of which were in combat), ensign to lieutenant commander |
| 1946–1956 | Humble Oil & Refining Co., field geologist to division exploration geologist |
| 1956–1990 | Roy M. Huffington, Inc., founder and chairman, international petroleum operations |
| 1990–1993 | U.S. ambassador to Austria |
| 1993–present | Roy M. Huffington, chairman; most time is spent in not-for-profit groups — educational, medical, charitable, cultural, and civic |

Accomplishment

The discovery of major gas reserves (15TCF) in Kalimantan (Borneo) and the creation of the multibillion-dollar liquefied natural gas (LNG) business in Indonesia. Indonesia now sells LNG to Japan, Korea, Taiwan

Disappointment

The fact that rampant corruption kept us from creating a major LNG business in Nigeria. This should be the richest country in Africa, and it is practically destitute.

Anecdotal story

I went to Indonesia in January 1968, and in August 1968, I signed a production-sharing contract (PSC) with their national oil company, then known as Pertamina. At the time, Indonesia had a bad reputation in the oil industry. It had just overcome an attempted communist coup at the end of 1965 in which hundreds of thousands of people had been killed. The economy was in total shambles, with many people on the street. Shell Oil Company had just been nationalized, when I arrived with the stated objectives of looking for gas. No other company was interested in searching for gas at the time. What would you do with gas on an isolated island?

I knew that Japan had real problems with air pollution and that gas, as a clean-burning fuel, could help clean up the atmosphere. Indonesia was the closest source of potential gas supplies for Japan. I was convinced I could find adequate gas supplies, but the biggest problem would be the financing of an LNG plant and export terminal.

Politically, after two months of dealing with the Indonesians, I felt certain that the country would be stable for a good number of years. They were desperate for money to stabilize the country and were working day and night. The energy minister said that if they didn't do it this time, they may never have anything.

After the PSC was signed, it was difficult to bring in additional joint venturers. Some still were worried about the political side, some didn't like the terms of the LNG contract, and two rudely said that good deals never walk in the front door of an office. In spite of this, the right joint venturers were located and brought into the deal.

After part of our seismic exploratory work was completed, we located a large, deep-lying anticlinal structure about eight miles long and four miles wide. With some shallow oil and gas fields present in the deltaic sands of the East Kutai Basin, I was convinced that this was the first wildcat I had ever seen that was a certain producer. When drilled, it came in with 1200 feet of net pay, all gas except for a few shallow oil sands at the top.

A second location was staked two miles north of the discovery. It was only after considerable difficulty that it was possible to convince our joint venturers to agree to put up their share of the well costs. The discovery was gas. What could we do with it? I guess I had forgotten to tell them that the plan was to sell it to Japan.

When the second well came in with about 1100 feet of net pay, it was evident that we had a major discovery. When subsequent drilling proved as much as three trillion cubic feet of gas to that time, negotiations with the Japanese for a market of three million tons of LNG per year commence. With the market arranged, the Japanese were then persuaded to finance two trains of an LNG plant for Indonesia.

Subsequently, the plant was expanded to eight trains and can now process four billion cubic feet of gas per day. It is currently the largest LNG plant in the world.

Advice

Never to give up, if you are absolutely convinced you are on the right project and the timing is correct. Find new and innovative ways to bring the project to fruition.

Harry Jamison

Career history

Born January 15, 1925

B.A. in geology, UCLA, 1949, with honors; attended Texas A&M and Oregon State in U.S. Navy program in World War II; postgraduate studies at UCLA; summer executive program, 1969, University of Southern California

1950–1966 Richfield Oil Corp., Bakersfield, California; Olympia, Washington; Los Angeles, California

1966–1985 Atlantic Richfield Co., Anchorage, Alaska; Dallas, Texas; Bellevue, Washington; Denver, Colorado,

1981–1985 President and senior vice president, ARCO Exploration Co.

1985–present Consultant

My proudest accomplishment was:

For eight years, I led the team that explored the North Slope and found and began development of Prudhoe Bay. I am still proud today, some 40 years later, of that group of geologists, geophysicists, surveyors, engineers, construction foremen, drillers, tool pushers, landmen, and all the others who worked so well together in very difficult conditions and met with ultimate success.

My biggest disappointment was:

I saw the promise of Prudhoe Bay delayed by the politics of pipeline construction, and later the potential of ANWR delayed or prevented from even being evaluated, much less thoroughly explored or possibly developed.

Anecdotal story

A few years after the discovery of Prudhoe Bay, I was in a company meeting in Dallas (I was chief geologist at the time), and a review of finding and development costs was under way. One of the planners presented a chart which did not include Prudhoe as a component of reserves added. I asked why, and the response was, "That was an aberration. It skews the results and was just a lucky find." I admit I lost my cool and heatedly replied, "That makes me want to throw up! Ten years of hard work, plus a lot of vision and a lot of guts went into giving us the opportunity to get lucky." There was a period of silence, and then the meeting proceeded. The Prudhoe reserves were not included in the chart and were seldom included thereafter in similar calculations. Go figure!

My advice to you is:

Be persistent in nurturing your ideas and dreams and those of others. The easiest thing in the world to do is kill a new and "tender" idea (play). It takes strong, courageous people to provide the opportunity for new ideas to grow and develop to maturity.

James O. Lewis



Career history

Born 1922

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|--------------|---|
| 1943 | B.S.M.E., University of Kentucky |
| 1949 | M.S. in geology, University of Kentucky |
| 1955–present | Consulting geologist |

My proudest accomplishment was:

Several prospects which I caused to be drilled and found producing sands were based 90% on surface geologic interpretations, 10% on information from previously drilled wells, 0% on geophysical information.

My biggest disappointment was:

A prospect which was drilled in the same area as above did not produce, although numerous wells provided subsurface structural and stratigraphic control that was sufficient to justify some seismic expense, which confirmed the prospect. This was about 30 years after the above successes.

My advice to you is:

- Remember — not everyone you meet will have your best interest as the top priority.
- Be like the “Wise Old Owl” — learn to listen.
- There is no such thing as a free lunch.
- Enjoy what you do and you will do it well.
- Do what you enjoy, not what you have to.
- Be active in your professional society.

Tom Mairs



Career history

Born 1937, Newton, Kansas

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|--------------|--|
| 1959 | B.S. in geology, the University of Oklahoma |
| 1962 | M.S. in Geology, the University of Oklahoma |
| 1961–1973 | Humble Oil & Refining Company/Exxon |
| 1973–1980 | Alamo Petroleum Co., vice president of exploration |
| 1980–1985 | Carlson Petroleum Co., vice president of exploration |
| 1985–present | Independent petroleum geologist |

Proudest accomplishments

Being involved in the oil and gas industry with its unique camaraderie, and I am humbly proud to be included in this tribute to our truly legendary geologists and oil finders.

Biggest disappointment

Learning that the first exploratory prospect I had originated with Humble Oil & Refining Company during the early 1960s had been condemned for a future lake-site and would not be drilled. Other disappointments were the first and last dry holes that I caused to be drilled.

Anecdotal story

As district geologist in Humble's Talco District, I was successful, after many attempts by myself and several predecessors, in finally convincing management to drill a step-out well considerably downdip to the current water level in the giant Talco Field. It resulted in finding a stratigraphic trap containing several million barrels of additional oil — an excellent lesson in perseverance!

My advice to you is:

Be an unselfish and active contributor to our industry, to professional organizations, and to life. And if you are determined to be a true oil finder, like several of these legendary people, do nothing else, but seek and persevere!

Acknowledgments

To all of the many who have helped me through life, but especially to Helen Bradford, my high school English teacher, who taught me responsibility; to Jack W. Trantham and Stephen W. Schneider, whose superb exploration talents and wonderful senses of humor have been a long and continuing inspiration to me; and to Esso Production Research Company, for excellent training in petroleum geology.

John A. Masters

Direct Detection Experts, Denver, Colorado



Career history

I was born September 20, 1927, in Shenandoah, Iowa — in tall-corn country in the southwestern corner of the state. It was my father's town, with aunts, uncles, cousins, grandmother — a small, neighborly, bosomy place, still my dearest memory.

I grew up in Tulsa, Oklahoma, then the "Oil Capital of the World." Everyone we knew was in the oil business. My stepfather, John Bartram, was a leading geologist-executive in Stanolind, the precursor of Amoco.

Mother was a lovely woman, nearly an angel, but ever a firm counselor. My brother, Chuck, two years younger, tagged along for 15 years then — boom — got bigger and stronger, followed me to Yale, and became a geologist.

I went through school in Tulsa, grew up nearly, discovered sports, and discovered girls. I wasn't notably successful with the latter two categories. I was smart enough to skip the second grade but not smart enough or big enough to be a leader until I got to graduate school. I had to work full speed at school to keep up. What I learned there may not have been as important as learning that you have to stay at it — hard.

My last year in high school, 1944, I won a four-year scholarship to Yale at age 16. I had a modestly good record at Yale, but the competition was fierce. I tried to major in engineering, flopped, and settled on economics — boring. I took two courses in geology in my senior year and was hooked.

During graduate school at Colorado U., I took one year of undergrad courses, one year of grad courses, and spent one year doing research and writing my the-

sis. I was a good student with top grades and loved it all. I did fieldwork in summers for Amerada and loved that too.

I married in my last year of school and graduated in 1951. I went to work for the U.S. Atomic Energy Commission on the Navajo Reservation in northeastern Arizona, looking for uranium — except we were ordered to call it something else. Very spooky! Don't let anyone see your Geiger counter!

Susie was my wife, buddy, field partner, and later mother of three wonderful children — Chuck, Barbie, and Alan.

In 1953, I signed up with Kerr-McGee to be an oil geologist. I moved to Oklahoma City and was mentored by the great Dean McGee. I moved to Midland, in west Texas, in 1954 and studied Permian reefs. I moved to Denver in 1955, at age 28, as manager of uranium exploration and district geologist for oil and gas. I found Ambrosia Lake that first year by myself, in New Mexico, the largest uranium deposit ever discovered in the United States. I found it in a new formation, in a new area, in an entirely new geologic environment.

I didn't know it, but that element of novelty would become my trademark. Ambrosia Lake was a very important asset in the cold war. The Russians realized, to their horror, that we could make an unlimited number of atomic bombs. It was a new game.

In 1957, I was sent to Canada for more seasoning in oil. I returned to Oklahoma City in 1959 as regional exploration manager of half of Kerr-McGee's operations. The most important area we had was the Gulf of Mexico, so I spent a lot of time in New Orleans learning about Tertiary sands, growth faults, and salt domes. I got pretty good at it, but Mr. McGee was better, so I never felt very important.

I was appointed chief geologist in 1961, at age 34, probably the youngest chief geologist of a prominent company in the United States.

In 1967, I found Dineh-bi-keyah, Field of the People, on the Navajo Reservation, right in the uranium area I had worked so intensively. I did this by myself, with an idea that came to me alone on a Saturday afternoon in the Kerr-McGee office in Oklahoma City. I had left Arizona 14 years before and hadn't thought much about the area since then. But that Saturday afternoon, my subconscious mind finally put together a geologic picture it had probably been wrestling with for the whole 14 years. Suddenly, in a single flash, I saw all the data in my memory rearranged into a convincing regional structural picture. It formed a huge buried anticline 35 miles long under most of the uranium area I had worked so long ago. It was probably the largest undrilled anticline left in the United States. It was virtually invisible to anyone who had not walked and

jeeped over nearly every mile of that structure. Indeed, it had stayed invisible to me for 14 years.

On that Monday, I went to Mr. McGee. He asked me about 20 serious, probing questions and then said, "OK." He was the clearest-thinking, most decisive man I've ever known. We drilled it and found no conventional reservoir rock, but it did have an igneous sill at 2800 feet — with good oil shows. Everyone wanted to plug it. McGee had sat a lot of wells as a young geologist for Phillips. This time, he didn't pay much attention to the rock type, the correlations, or the structural position. He was fixated on the oil show. He said, "Test it." No oil. He said, "Acidize it." No oil. Then he said, "Frac it." The well came in for 648 BOPD of 45° API gravity oil. We drilled 31 wells which produced an average of more than 500,000 barrels each from 2800 feet. Total production was nearly 20 million barrels.

That was my igneous intrusive field, mine and Mr. McGee's — a screwball, one of a kind. The rule learned from that was that you don't have to be entirely right — just right enough, and ahead of everyone else. And work for someone like Dean McGee.

My next assignment was as president of Kerr-McGee of Canada, in Calgary, starting in 1967. I stayed until 1973 and learned a lot, but made no discoveries. Mr. McGee decided I could be more useful in the Gulf and wanted me to transfer. I went to Oklahoma City and told my favorite person in the whole world that I didn't want to do that. I thought I had better opportunities in Canada. Mr. McGee wasn't upset. He looked at me with pride. "John," he said, "you can only keep a stallion in the corral for a short time. Eventually, he has to run free. Good luck. Let me know if I can ever help you."

It was shortly after this that Susie died. She took her own life in a terrible tragedy of loneliness and despair. I cannot recount it or explain it satisfactorily. I will not try again because it never works.

The next chapter was Canadian Hunter. Jim Gray and I left Kerr-McGee together and offered ourselves to every large company in Canada. We were not met with enthusiasm. Finally, Noranda Mines admitted that Jim was the son of one of its past directors. That carried a lot of weight in the old-style Canadian companies.

Pretty soon, we were hired to start up their entry into Canadian oil. The chairman was Alf Powis. He asked us how much money we would need. I said, "I don't see how we can spend more than \$5 million a year." Three years later, our budget was \$180 million!

I identified a very large area in western Alberta which I thought had an abundance of favorable leads to a new type of gas trap. It had never been described in academia or the literature of geology. No company accepted it as a meaningful exploration concept. I called it Deep Basin, to describe its position in the deep

syncline (unfavorable), downdip from water (impossible), in low-permeability reservoirs (unfavorable), with lots of electric-log-calculated gas shows (undoubtedly a misinterpretation). This was not a propitious start.

On that first prospect, we drilled six dry holes, as described below in my anecdotal story. They cost \$1 million each. Noranda was ready to jump ship. The seventh well hit big and discovered the largest gas field in the history of Canadian oil and gas exploration. Once again, you see, my exploration flashes favor the bypassed, unpopular regions.

At the same time, I found my wife Lenora. She cost about the same as Elmworth but is much more valuable. We have added two fine boys to our total family. Lenora is my greatest discovery.

The development of Elmworth and several other new fields followed apace. Our company grew from two to 325. We became the tenth-largest gas producer in Canada. We were famous — in Canada, at least.

In 1992, I was stunned to find that Noranda's corporate rules required all officers in the mother company and all subsidiaries to retire at age 65. I couldn't believe they wouldn't make an exception, but they wouldn't — something about visibility, bad precedent, and other bureaucratic crap. In 1994, I left Calgary after 27 years as a Canadian because I would not adapt to being a has-been in my industry, in my city, in my life. It was a cruel event, made more cruel by human selfishness and the opportunity which opened to those people for advancement.

A large independent in Denver named me president of his oil company and introduced me to his 20-person staff. I brought in two more ex-Canadian hunters who are still the best technical people he has. I was there three years. He was used to people doing what he told them to do. I'm not very good at that. Nothing worked very well. He couldn't find oil and he wouldn't let me do it. Finally, he told me to leave. I had one day to pack up. I had been a successful geologist for 47 years. This was an interesting new experience.

I had one more job which was even more unsatisfactory, but again, a new experience.

Finally, I had to deal with the life lessons involved. I was counseled to be more cautious, more suspicious of people. At first, that made a lot of sense. But at last, I was unwilling to abandon my identity. I believed I had had a good career. Overall, I trusted and respected people and expected the same from them. The results, statistically, were quite good.

John Burns, president of Frontier Oil, called me for a talk. He explained his company, its purpose, its target. After an hour, he said he was trying to remake his company and wanted me to head exploration and my old, treasured friend Dick Wyman, from Hunter days,

to head engineering. I said instantly, "John, if you're smart enough to hire Dick Wyman, I'll join you." So much for a careful, cautious approach! But this time, my old way worked fine.

I stayed two years with Frontier, but our program in North Dakota failed, and the company disappeared.

Life in the U.S. oil business had not been very fulfilling, but I had a new idea. Frontier's reservoir engineer was a very smart fellow named Alan O'Hare. We were always able to deal with problems by combining our mental strengths rather than letting them create a contest. He is left-brained, analytical, and quantitative. I am right-brained, conceptual, and imaginative. Together, we get all the facts right and then paint in the blank spots to make a whole picture. It works fine if both partners are good enough.

We are now embarked on a whole new chapter. We formed DDX, Direct Detection Experts, L.L.C., to apply the well-evaluation lessons I had developed at Canadian Hunter. We find that the resulting measurements can exceed the more routine numbers ordinarily accepted by a busy industry focused on a particular set of problems in deep-water Gulf of Mexico and other marine environments. Amazingly, most of the onshore United States has been abandoned by the major companies because it is no longer favorable for finding large structures by seismic operations.

There are a few critical factors in reservoir evaluation which can be measured more accurately by precise microscope readings than by customary methods. It is also true that a few experts can read critical additional information from electric logs and drillstem tests. Careful attention should also be given to mud logs.

A small group of expert reservoir analysts under my direction changed exploration history in Canada. I think we can do the same thing in the United States. We have carefully analyzed enough dry holes in the United States to believe that there are literally thousands of bypassed wells that were incorrectly interpreted and subsequently abandoned. Elmworth was found in an abandoned area of 85 bypassed wells. We found Keg River Gething and Ring-Border the same way. We now have several very large, very promising bypassed prospects in the United States.

Over a long career, I have learned a vital lesson of exploration. It is rooted in science and engineering, but finally, it steps beyond them in wisdom and total experience. I have come to call it the Eleventh Commandment: *Thou shalt not give up.*

My proudest accomplishment was:

The discovery of Elmworth gas field in Alberta in 1976, the largest gas field in Canada.

My biggest disappointment was:

Retiring from Canadian Hunter at age 65.

Anecdotal story

Hanging in there by yourself is not easy. New ideas can be very unpopular.

I was young, and my small Canadian Hunter company had existed for only three years. Our parent company, Noranda, was a giant in the Canadian mining business and was very self-assured. My prospect at Elmworth in 1976 in Alberta was almost entirely counter-current. It was bottom of the basin, downdip from water, an entirely new reservoir, and in the middle of a long trend of 85 dry holes. We drilled six dry holes costing \$1 million each. My staff members were discouraged. They were sure the trend was northeasterly, but we had worn that out, and the Noranda board was rebellious.

I went to Toronto with maps to plead with the chairman for one more well. "Alf," I said, "this has to be a big field. There are just too many good indicators. We must be going in the wrong direction. Let's go northwest. Just one more well."

"John, one more million-dollar well might cost your job and mine too. The board thinks we're crazy."

I said, "We gotta do it. This could be a giant."

Long pause. Silence. "OK, John, it's just you and me. Make it good or we'll both be on the street."

We drilled it, had four Lower Cretaceous shoreline conglomerate zones at 6000 feet, tested them, and flowed a total of 24 MCMCFD. Elmworth developed into the largest gas field in the history of Canada.

My company never did anything new that a majority agreed to. Majorities don't look down the road. They look in the mirror.

My advice to you is:

The United States still has large reserves of gas in low-permeability reservoirs in basin-center accumulations.

Acknowledgments

I have been blessed with very wise mentors who guided my way through the wide variety of experiences it takes to form a competent explorationist. Professor Warren Thompson forced me to think on a regional scale. Rodger Denison started me off as an oil geologist and gave me my first recognition. A. I. Levorsen was a friend and counselor. Mark Millard recognized me as a key executive in the great Noranda Company. Dean McGee taught me, guided me, and accepted me as a proven oil and gas and mineral finder. Mr. McGee was the grandest human being I have ever known.

Robert E. (Bob) Megill**Career history**

Born November 26, 1923, Lawrence, Kansas

1941–1942	Carter Oil Co., Tulsa, Oklahoma
1942	Joined U.S. Navy (Seabees) in December; served three years
1944–1945	100 hours in naval officers' training, the University of Oklahoma
1945–1948	B.S. in geological engineering, the University of Tulsa
1948–1984	Carter Oil Co., Tulsa; transferred to Humble Oil, Houston (later known as Exxon USA); total of 40 years with the company
1984–1991	Petroleum consultant

My proudest accomplishments were:

The reception by peers of my writing, my books, and the monthly column for the AAPG Explorer which I wrote for almost 13 years.

The number of young people who thanked me for being their mentor.

The opportunities I had to teach within Exxon, AAPG, and the petroleum industry, in the areas of exploration economics, risk analysis, and personal productivity.

My biggest disappointment was:

The inability to convince the Offshore Division to accept an updated computer program for calculating bids for offshore leases.

My advice to you is:

Find out what you enjoy doing the most, and concentrate your skills in that area. Always consider part of your work to be training the young people who will follow you.

Charles G. (Gil) Mull

Petroleum geologist
Alaska Division of Oil and Gas, Anchorage, Alaska

Career history

Born 1935

- | | |
|--------------|--|
| 1957 | B.S., University of Colorado, Boulder |
| 1960 | M.S., University of Colorado, Boulder |
| 1961–1965 | Richfield Oil Corp., Anchorage, Alaska |
| 1961–1962 | Field geologic mapping and well-site geology, Gulf of Alaska district, Alaska Peninsula, and Yukon-Porcupine district, east-central Alaska |
| 1963–1965 | Field geologic mapping, Brooks Range and Arctic North Slope, Naval Petroleum Reserve #4 (NPR-4) and Arctic National Wildlife Refuge (ANWR) |
| 1965–1967 | Atlantic Richfield Company, Anchorage, Alaska |
| 1965–1967 | Field geologic mapping, Brooks Range and Arctic North Slope, NPR-4 and ANWR, and well-site geology |
| 1967–1975 | Exxon Co., USA, Los Angeles and Denver |
| 1967–1973 | Field geologic mapping, Brooks Range and Arctic North Slope; well-site geologist on Prudhoe Bay oil-field discovery and confirmation wells |
| 1974–1975 | Field geologic mapping, Chugach–St. Elias Mountains and Gulf of Alaska province |
| 1975–1981 | U.S. Geological Survey, Menlo Park, California, and Anchorage, Alaska, Office of National Petroleum Reserve in Alaska, and Branch of Alaskan Geology |
| 1975–1981 | Field geologic mapping, numerical modeling, and resource appraisal projects, National Petroleum Reserve in Alaska (NPRA), ANWR, and Arctic North Slope |
| 1981–2001 | Alaska Division of Geological and Geophysical Surveys, Fairbanks |
| 1981–2002 | Senior petroleum geologist, field geologic mapping, and resource appraisals, Brooks Range and Arctic North Slope, NPRA and ANWR; affiliate professor of geology, University of Alaska, Fairbanks |
| 2001–present | Alaska Division of Oil and Gas, Anchorage, Alaska; senior petroleum geologist, field geologic mapping, and resource appraisals–basin analysis, Brooks Range and Arctic North Slope, NPRA |

My proudest accomplishment was:

To have had the opportunity to be a member of a unique organization that fostered teamwork among a diverse group of geologists, geophysicists, landmen, engineers, construction foremen, tool pushers, and drillers, under a management that encouraged individual initiative, supported its people, and thereby successfully explored the North Slope and began development of Prudhoe Bay. It was the beginning of an outgoing career that has continued with the excitement of geologic discoveries in northern Alaska.

My biggest disappointment has been:

Politics and the extreme polarization of public opinion that have prevented further evaluation of the Arctic National Wildlife Refuge, which certainly can be done in an environmentally sound manner. Furthermore, it is a real shame that there has been so little progress toward a national energy policy that encourages responsible exploration and multiple-use development on public lands while simultaneously incorporating aspects of conservation and development of alternative energy supplies.

My advice to you is:

Be persistent in nurturing your ideas and dreams and those of others. The easiest thing in the world to do is kill new, innovative, and “tender” ideas or plays. It takes strong, courageous managers to have confidence in the abilities of their staff members to provide the opportunity for new ideas to grow and develop to maturity.

James F. Reilly II

Career history

Born 1954

Education: University of Texas, Dallas, B.S., 1977;
M.S., 1980

Employment: Enserch Exploration, Santa Fe Minerals,
Dallas, Texas; National Aeronautics and
Space Administration, Houston, Texas

My proudest accomplishment was:

I'm not really sure I've had it yet. I can look back at a lot of things that I'm really proud of — fields that I've worked on, places I've been, earning my Ph.D. while working full time, flying in space and not screwing anything up — but I think my best achievement is still being a dad to three teenagers.

My biggest disappointment was:

When I was in the aerospace engineering program at UT and on a USNR scholarship, I wanted to fly jets, go to test-pilot school, and shoot for an astronaut slot. Unfortunately for me, the end of the Vietnam War resulted in a huge reduction in personnel and the indication that I wouldn't get the chance to fly.

Big life-changing moment: I entered the geosciences program at UT-Dallas after spending a year and a half saving up some bucks to go back to school. That decision got me to the Antarctic, a really good job for 17 years in the exploration industry, and the opportunity to work on the seafloor and eventually to fly in space. So as Winston Churchill remarked years later about being turned out of office in 1946, "It was a blessing in disguise; and very well-disguised it was at the time!"

My advice to you is:

When I speak to schoolkids, I tell them that whatever they wish to do in life, the best thing to remember is that the only people who can tell them they can't do something and have it stick are themselves. Anyone else who tells them they can't do something can and should be proven wrong at every opportunity. This advice is good at any age, I think.

James D. Robertson



Career history

Born 1948

1970	B.S.E. degree in geological engineering, Princeton University
1975	Ph.D. degree in geophysics, University of Wisconsin
1975–2000	Atlantic Richfield Company (ARCO)
1975–1985	Geophysical and geological research
1985–1990	Domestic U.S. exploration
1990–2000	International exploration
2001–present	Rannoch Petroleum LLC
1994–1995	President, Society of Exploration Geophysicists (SEG)

My proudest accomplishment was:

Working constructively and creatively as an exploration executive with hundreds of ARCO people during 10 years of international exploration to find 1.5 BBOE net to ARCO (6 BBOE gross) of oil and gas reserves at a finding cost of less than \$2 per boe. International petroleum exploration is a rich complexity of leading-edge science, major capital allocation, thoughtful risk taking, insightful strategic vision, wise portfolio management, global interpersonal relationships, and broad cultural diversity. Few other jobs offer such a rewarding and fascinating professional career, and I was privileged to work with a great group of people in ARCO's international exploration group.

My biggest disappointment was:

Not having enough good mentors during my career, and not realizing the importance of good mentors until late in my career.

An anecdotal story

In the early 1990s, I traveled to ARCO's office in Jakarta, Indonesia, with Marlan Downey, who at the time was ARCO's international exploration vice president. The Jakarta explorationists showed us their prospect inventory, including a carbonate feature that had been penetrated by some wells and had one or two high-rate tests. The exploration team waxed eloquent about the size of the trap and the strength of the charge. Marlan added to the enthusiasm by noting how much gas could flow through a single one-millimeter fracture intersecting a borehole, and then casually asked how much porosity would be present in a heavily fractured rock if one had only the fractures to hold gas.

The team shortly thereafter got the point — the feature was hopelessly uneconomic without connected matrix storage, despite the size and attractive flow-through fractures. The exchange was a memorable lesson that great oil and gas explorers quickly focus on the weakest elements of an exploration prospect. They carefully consider whether a weakness is a fatal flaw or instead an uncertainty that might be reduced through additional investigation. Time and effort are spent analyzing and quantifying weaknesses, not burnishing and extolling a prospect's obvious strengths.

My advice to you is:

Make lifelong learning a meaningful part of your professional life, recognizing that learning takes many forms, from on-the-job training to formal courses to volunteer activities to reading technical literature. Your job skills and your ability to work with others are the foundations of a successful career and make you valuable, independent of any particular employer. And don't hesitate to teach others or add to the technical literature yourself. That is when you find out what you really know.

Peter R. (Pete) Rose**Career history:**

Born 1935, Austin, Texas

1957	B.S. in geology, University of Texas, Austin
1959	M.A. in geology, University of Texas, Austin
1959–1966	Shell Oil Co., Houston, Miami, Corpus Christi, New Orleans
1968	Ph.D. in geology, University of Texas, Austin
1968–1969	State University of New York, Stony Brook
1969–1973	Shell Oil Co., Denver, Midland
1973–1976	Chief, Oil and Gas Branch, USGS, Denver
1976–1980	Chief geologist, Energy Reserves Group, Houston
1980–1998	Independent and consultant dba Telegraph Exploration, Inc., Telegraph and Austin
1988	Visiting distinguished professor, Kansas State University, Manhattan
1999–present	Managing partner and senior partner, Rose & Associates, LLP, Austin

My proudest accomplishments are:

Personal: Virginia, Cathy, Peggy (and Greg), Wally (and Kim), Jennifer (and Mark) — all living independent, educated, successful, and fulfilled lives; being married to Alice.

Professional: Through E&P Risk Analysis, I have helped more than 10,000 geoscientists and engineers learn how to evaluate their ventures objectively, making E&P more efficient, stockholders more prosperous, and prospectors more professional. I established Rose & Associates, LLP, in 1999.

AAPG: Through DPA and HOD, I have helped expand the influence of the membership in AAPG governance and improve AAPG business performance during 1995–2000, and I have helped expand mentoring and professionalism in AAPG.

My biggest disappointments were:

Personal: Taking 54 years to find Alice.

Professional: Not opening a big low-volume gas field in the Raton Basin in 1985, and nearly going broke in 1987.

AAPG: Contributing to the contentious AAPG atmosphere during 1997–2000, and bruising some friendships in the process. Change is painful.

Career reflections

I never had to worry much about getting motivated — almost every geological task I ever undertook fascinated, changed, and rewarded me, leaving indelible memories:

- balmy days on carbonate sandbanks in the Bahamas
- catching cores in the middle of the night in south Texas
- the creak of a lonely windmill on a summer evening after a day of mapping the Edwards Plateau
- tracing Carboniferous facies westward, range by range, across the Rockies
- despite USGS bureaucracy, building a relevant E&P research program and staffing it
- the bitter disappointment of every dry hole, and the jubilation of my few discoveries
- the fulfillment that came whenever I was able to serve a client well with sound, forthright, timely counsel
- finally learning to just tell it like it was, and simplifying everyone's lives in the process
- teaching risk analysis with Bob Megill and Ed Capen, and growing enormously in the process
- seeing sparks of insight kindle and grow in thousands of students
- building a thriving little company from a 20-year sole proprietorship
- learning what it took to become a professional, and deriving great satisfaction in trying to live like one
- 10,000 pleasant recollections of warm, lasting friendships in a global web of valued colleagues.

I've been accused of being a workaholic. Maybe so, but it was mostly fun to me and still is. What a blessing this lifelong geological career has been for me!

My advice to you is:

- Work hard at whatever gives you joy.
- Cast your bread on the waters.
- Live within your means.
- Tell it like it is.
- Give a damn.

Acknowledgments

Over the past 50 years, a lot of generous and gifted people provided special support, mentorship, and example (as well as some thoroughly warranted “swift kicks” as focused incentive). Among my geological mentors, I must acknowledge Charley Bell, Bob Folk, Baxter Adams, Ted Cook, Harry Thomsen, Jim Clement, Sid Bonner, Bob Megill, and Bill Fisher. Nongeological mentors include Floyd Davis, Edgell Pyles, Gerry Geistweidt, Charley Dowell, and Lynn Hughes. I am profoundly grateful for their friendship.

Jack W. Schanck

Career history

Born July 8, 1951, Pittsburgh, Pennsylvania

B.S. in geology, Allegheny College, Meadville, Pennsylvania

M.S. in engineering geology, University of Memphis, Memphis, Tennessee

- 1990–1992 President, Unocal Canada, Calgary, Alberta, Canada
- 1992–1994 Vice president, Worldwide Exploration (Unocal) Sugar Land, Texas
- 1994–1996 Group vice president, Oil & Gas Operations (Unocal), Sugar Land, Texas
- 1996–1999 President, Spirit Energy 76 (Unocal), Sugar Land, Texas
- 1999–present Co-chief executive officer, Samson Investment Company, Tulsa, Oklahoma

My proudest accomplishments were:

There have been two — one personal and one professional. On the personal side, I was proud of raising a family and seeing them all become successful in their own rights.

On the professional side, my proudest accomplishment revolves around productivity of operations. While at Unocal, I led the turnaround of Unocal Canada from an operation that lost money to one that contributed 10% of the total worth of the company. While at Samson, in the last two years, I helped implement change that has led to an increase in value of about 50%.

My biggest disappointment was:

Not taking sufficient risk early in the pursuit of exploration opportunities, deep-water Gulf of Mexico, Unocal.

Anecdotal story

I had the opportunity to attend the initial Hedberg conference organized by Pete Rose on risking, held in Salt Lake City. It was, to my knowledge, the first time representatives from most major oil companies had met to discuss what we know and do not know about the subject of addressing risk in our business. The participation was all open, honest, involved, and concerned. I left the meeting with a strong appreciation for the importance of shared learning and of the high-caliber men and women who work in the industry.

After the conference, a few of us went horseback riding in the foothills. Forty-five minutes into the ride, I was thrown from my horse and landed in a patch of cactus — bringing me a whole new appreciation for risk assessment.

My advice to you is:

Seek out opportunities for change by looking at yourself first. Ask yourself, “How and what can I change that will have a positive impact on those around me?”

Harrison H. Schmitt

Career history

Born: Santa Rita, New Mexico, July 3, 1935; grew up in Silver City, New Mexico. Mother, Ethel Hagan Schmitt (educator and naturalist); father, Harrison A. Schmitt (mining geologist)

Education: Western High School, 1953; California Institute of Technology, B.S., 1957; Fulbright Fellow in Norway, 1957; Harvard University, Ph.D., 1964; NSF Postdoctoral Fellow, 1964

I have been privileged to acquire diverse experience as a geologist, pilot, astronaut, administrator, businessman, writer, and U. S. senator. My Ph.D. was based on geologic field studies in Norway. As a civilian, I received U.S. Air Force jet pilot wings in 1965 and U.S. Navy helicopter wings in 1967.

I was selected for the NASA scientist-astronaut program in 1965. I organized the lunar science training for the Apollo astronauts, represented the crews during the development of hardware and procedures for lunar surface exploration, and oversaw the final preparation of the Apollo lunar module descent stage. I was designated as mission scientist in support of the Apollo 11 mission.

After training as backup lunar module pilot for Apollo 15, I served in that same capacity on Apollo 17 — the last Apollo mission to the moon. On December 11, 1972, I landed in the Valley of Taurus-Littrow as the only scientist and the last of 12 men to step onto the moon.

In 1975, after two years of managing NASA's Energy Program Office, I fulfilled a long-standing personal commitment by entering politics in 1976. I served in the U.S. Senate from 1977 through 1982, representing my home state of New Mexico. I was a member of the Senate Commerce, Banking, Appropriations, Intelligence, and Ethics Committees. In my last two years in the Senate, I was chairman of the Subcommittee on Science, Technology, and Space and of the Appropriations Subcommittee on Labor, Health and Human Services, and Education.

I later served on the President's Foreign Intelligence Advisory Board and the President's Commission on Ethics Law Reform, as cochairman of the International Observer Group for the 1992 Romanian elections, as vice chairman of the U.S. delegation to the 1992 World Administrative Radio Conference in Spain, and as chairman of the Technical Advisory Board for the U.S. Army Research Laboratory.

I consult, speak, and write on policy issues of the future, space, the science of the moon, and the American Southwest. I am chairman emeritus of the

Annapolis Center (risk-assessment evaluation) and am an adjunct professor in the Department of Engineering, University of Wisconsin–Madison, teaching a course on resources from space.

My current corporate board memberships include Orbital Sciences Corporation and PhDx Systems, Inc., and I am a member of the Corporation of the Draper Laboratory. I am a founder and the chairman of Interlune-Intermars Initiative, Inc., advancing the private sector's acquisition of lunar resources and Helium-3 fusion power and broad clinical use of medical isotopes produced by fusion-related processes.

I am honored to have received these awards: the 1973 Arthur S. Fleming Award, 1973 Distinguished Graduate of Caltech, 1973 Caltech Sherman Fairchild Scholar, NASA Distinguished Service Award, Fellow of the AIAA, honorary member of the Norwegian Geographical Society and Geological Association of Canada, 1989 Lovelace Award (space biomedicine), 1989 G. K. Gilbert Award (planetology), and Honorary Fellow of the Geological Society of America, American Institute of Mining, and Geological Society of London. I have received several honorary degrees from U.S. and Canadian universities.

My proudest accomplishment was:

It is hard to choose among surviving Caltech, completing my Ph.D. at Harvard, becoming a jet and helicopter pilot, going to the moon, being elected to the U.S. Senate, being of some influence in lunar and planetary science, and persuading my wife, Teresa, to marry me.

My biggest disappointment was:

Probably none that is significant in retrospect, but not learning mathematics as a language comes close.

Anecdotal story

Sometime in late 1963 or early 1964, I remembered a most interesting visit with Gene Shoemaker in Menlo Park and decided to write him a letter to see if he was hiring geologists for his new USGS Branch of Astrogeology. Coincidentally, Gene had decided to contact the four geologists who had the top scores on the 1963 exam for Geological Survey employment to see if any were interested in joining his new branch, now headquartered in Flagstaff, Arizona. Gene's Astrogeology Studies Group, which I had visited in 1960, had morphed into a major new USGS initiative, largely funded by NASA contracts. Our letters of mutual inquiry literally crossed in the mail, and with the completion of my NSF Fellowship in June 1964, I headed back west.

Carolyn and Gene Shoemaker had decided in the spring of 1962 that Flagstaff would be a great place to

live and raise a family, eventually persuading the leadership of the Geological Survey to locate the new branch there. Sadly, any reality of Gene realizing his dream of going to the moon had evaporated soon after our first meeting, in 1960. While working temporarily at NASA headquarters in Washington, he almost died from the effects of Addison's disease, a treatable but incurable thyroid deficiency.

As an unsuspecting and unsuspected surrogate for Gene in regard to his going to the moon, and with no comparable dreams, I arrived in "Flag" on July 7, 1964. At Gene's invitation, I began to look at the various projects under way as part of NASA contracts he had corralled.

Although I took a familiarization trip to the Caltech Jet Propulsion Laboratory where the lunar surveyor project was being managed for NASA, it was not clear to me exactly how I could contribute significantly to the effort. Gene's surveyor "television experiment" team was well staffed, led by geologist Elliot Morris and including photogrammetrist Ray Batson, geologist Hank Holt, and technology expert Jay Rennilson.

On the other hand, a more intriguing project, newly funded by NASA, needed someone as project chief. This was an effort to begin, for the first time anywhere, the definition of the types of observation, photographic, and sampling techniques that would be useful to the Apollo astronauts on the moon. What field geologist could pass up this challenge? Thus, I became chief of the Lunar Field Geological Methods Project, just before the arrival of several more geologists whom Gene Shoemaker had enticed to join him in Flagstaff.

With offices in the Arizona Bank Building in downtown Flagstaff, the Lunar Field Geological Methods Project picked up speed as Gordon Swann and I began to experiment with various possible field techniques that might be of use on the moon. Although both of us were total novices at looking at the various problems presented by this challenge, in retrospect, I now know that everyone else was also.

Certain things, however, were obvious as we began to think in the context of Apollo missions. Sampling of rock and soil and labeling the samples collected would be job one. The geologic context of those samples would be observation, verbal description, and photography of sample locations and other spatially and genetically related features.

Although many geochemists did not worry much about this context, geologists in general knew that without it, full and maybe correct understanding of much of the more subtle data obtained by analysis of the samples back on earth would be impossible. The challenge was to make these standard field geologic tasks as efficient as possible, given the operational con-

straints of a stiff, limited-visibility space suit, of radio communications as the only means of recording observations, and of all the other routine activities necessary to preserve life, limb, and mission. Little did we realize in those early days just how constraining these "operational" factors would become as actual Apollo exploration was planned years later.

In October 1964, years of discussion between the scientific community and NASA finally bore fruit — the National Academy of Sciences and NASA issued a joint request for applications from scientists and physicians for the first selection of scientist astronauts. The principal requirements were a Ph.D. or equivalent, born after July 31, 1930, six feet or less in height, and able to pass a rigorous flight physical.

It is hard for me to believe in retrospect, but I had not seriously thought about the possibility of becoming an astronaut until that announcement appeared on the office bulletin board. Reading it over, I thought for about 10 seconds and began to take steps to "raise my hand," that is, send in my application. I realized that I would regret not applying if humans actually went to the moon, and I might just have a chance to be one of them.

My advice to you is:

Prepare for as many unanticipated opportunities as possible.

John N. Seitz

Career history

Born 1951

1974 B.S. in geology, University of Pittsburgh

1975 M.S. geology, Rensselaer Polytechnic Institute

1977–present Anadarko Petroleum Corp.

My proudest accomplishment was:

The discoveries made by my company (Anadarko) in Algeria, Alaska, the Gulf of Mexico, and East Texas (Berkine Basin, Alpine and Moose's Tooth, Mahogany, Tanzanite and Hickory, and Bossier Fields).

My biggest disappointment was:

My inability to convince my company to be an early deep-water player.

My advice to you is:

It is not enough to just have a good idea; you must be willing to submit that idea to public scrutiny.

Dan L. Smith



Career history

Born 1936

1958 B.S. degree in geology, University of Texas at Austin

1958–1967 Pan American Petroleum Corp. (changed name to Amoco; now BP Petroleum); transferred seven times in nine years

1967–1970 Roberts & Whitson Petroleum Corp., exploration manager

1970–1992 Texoil Company, part owner, executive vice president, and exploration manager

1992–1999 Meridian Resources Corporation, four years as a consulting explorationist; two years as vice president, exploration; one-and-a-half years as vice president, new ventures

1999–2001 Independent/consultant

2001–present Sandalwood Oil & Gas, Inc., executive vice president, exploration

My proudest accomplishments

Career: Instrumental in drilling approximately 100 successful wells that led to the discovery of 30 new fields or major extensions.

Career: Developed an exploration program onshore Gulf Coast that included doing 3-D seismic before drilling, and demonstrated that 3-D seismic, although adding considerable capital dollars to the generation of a prospect, dramatically improved the economics of exploration. The company executing this program was the first Independent to conduct 3-D seismic onshore.

This was during a time when 3-D was gaining momentum, but most people in the industry believed that the method would be uneconomic onshore.

Professional: Attaining the position of president of the American Association of Petroleum Geologists, an international organization.

My biggest disappointment

Career: Identifying and generating two large prospects which I was unable to lease. The first was the south half of a large onshore dome where the land was owned in fee by a major company. After trying to negotiate a farmout for at least five years, the fee owner drilled the prospect, resulting in the discovery of approximately one TCFG. The second was the west flank of an onshore Gulf Coast Dome that was unleased when first checked. One month later, I sent land people to obtain leases, only to learn that a company had beat me to the punch by two weeks. That field ended up with 20 wells finding eight sands containing approximately 200 million barrels of oil.

Business: I had a major part in building a midsized independent company, Texoil, during the 1970s and early 1980s, only to have everything fall apart in the mid-1980s with the collapse of the oil and gas business

An anecdotal story

The scene is the late 1980s, and once again, my world seems to be collapsing. The oil and gas business has been declining for seven years, and it is evident that the company in which I am a partner will not survive. I have three children in college and a fourth primed to enter college soon. I try not to panic. What to do?

New technology, 3-D seismic, had been working successfully in reducing exploration risk offshore. My expertise was onshore, where I had an inventory of prospects based on 2-D seismic. I put together a plan to find a company willing to risk using this new technology onshore. It worked. I was able to stay in business as an explorationist and get my children through college.

Again, I learned a valuable lesson: In the middle of difficulty, there is always opportunity.

My advice to you is:

The oil and gas exploration business is cyclical, with serious downswings and upswings. The successful explorationist should be prepared to change jobs — and possibly careers — several times in a lifetime. However, although it might seem bleak, this situation exists in nearly every industry in today's technological world. A career in geoscience offers the unusual opportunity of a lifetime in a very satisfying professional career. The following three things are critical:

- Professionalism and ethics are first and foremost. The reputation that one establishes will determine success. One screwup in ethics can ruin a career.
- Continuing education is necessary to stay current with fast-changing technology. Half of what one uses in technology will be out of date in approximately five years.
- Contacts and business relationships are essential. Thus, actively volunteering in local and national professional societies, where most contacts are made, are a big plus.

Acknowledgments

I find it very difficult to name specific individuals who have influenced my professional life. There are simply way too many to list. Instead, I will state that my affiliation and support of local and national professional societies is the single factor that has allowed me to have an active and fruitful career as a petroleum explorationist. The hundreds of friends and associates I have known through these activities continue to make a difference in my career and personal life.

Robert M. Sneider

Sneider Exploration, Inc., Houston, Texas



Career history

Born 1929

- | | |
|--------------|--|
| 1951 | B.S. degree in geology (three years in engineering), Rutgers University |
| 1951–1952 | U.S. Army Corps of Engineer officer, U.S.A. and Korea |
| 1962 | Ph.D. degree in economic geology and mining engineering, University of Wisconsin, Madison |
| 1957–1974 | Shell Oil and Shell Development Companies |
| 1974–1981 | Sneider and Meckel Associates, Inc., an exploration and geoscience–petroleum engineering consulting company |
| 1981–present | Robert M. Sneider Exploration, Inc., an exploration, property acquisition, and development geoscience–engineering consulting company |
| 2000 | Elected to the National Academy of Engineering |
| 2001 | AAPG Sidney Powers medalist |

My proudest accomplishments were:

- Building or helping to build five financially successful small companies, including Sneider and Meckel Associates, Greenhill Petroleum, and Canadian Hunter Exploration.
- Sharing my views on E&P, petrophysics, and teams to thousands of geologists, geophysicists, petrophysicists, petroleum engineers, and managers through the AAPG, SPE, SEG, and different training organizations.
- Finding new hydrocarbon reservoirs in economically marginal fields and in new wildcats.

My biggest disappointment was:

Drilling unsuccessful wells or failed recompletions.

My advice to you is:

Learn the fundamentals of petroleum accumulation and production, including physical-chemical properties of rocks and fluids.

Acknowledgments

Many colleagues and coworkers have had a significant impact on my professional career and have helped me to achieve what success I have had. Three people, however, have had the greatest impact — Dr. B.F. Leonard, Dr. John J. Prucha, and Mr. Gus Archie.

In the 1940s, Leonard was a U.S. Geological Survey geologist at Princeton University and Prucha was a professor at Rutgers University and later a New York Geological Survey geologist. Both Leonard and Prucha were excellent teachers who exhibited a passion for geology that was infectious. They also taught me the value of detailed structural and stratigraphic mapping and the importance of understanding rock petrology in regional exploration. They were my models for how dedicated earth scientists apply theory to the search for mineral wealth.

Gus Archie, a research manager at Shell Development Company, hired me in 1956 and guided my early career in development geology and petrophysics at Shell. Archie was a quiet, unassuming genius but a superb teacher and mentor. He taught me how to view subsurface fluids and rocks on both exploration and development scales.

Discoveries and property acquisition that I have been associated with are the result of philosophy and knowledge gained from the association with Archie, Leonard, and Prucha, as well as many other colleagues.

H. Leighton Steward



Career history

Born 1934, Fairfield, Texas

B.S. and M.S., geology, Southern Methodist University

1962–1979 Shell Oil Company, division exploration manager and chief exploration operations, worldwide

1979–1981 Burlington Northern, vice president energy and minerals

1982–1997 Louisiana Land & Exploration Company, chairman, president, and chief executive officer

1979–2000 Burlington Resources, vice chairman

Former chairman of the U.S. Oil & Gas Association, Natural Gas Supply Association, National Wetlands Coalition, and All-American Wildcatters

My proudest accomplishments were:

- Working at Shell with Mike Forrest to document “bright spots” (about two years ahead of the industry) and then leading offshore GOM lease sales that used that information to dominate the sales in the early and mid-1970s.
- Successfully founding, organizing, hosting, and facilitating annual meetings of all the key energy industry association’s leadership (the paid presidents and the current company chairmen) to forge unified messages to state and national governments — API, USOGA, IPAA, NGSA, NOIA, DPC, and NPRA.

My biggest disappointment was:

Not being successful at selling the idea of a unified, relatively inexpensive way to improve our industry’s public image. We are still lying on the floor and letting people and the media kick us in the ribs with false and very misleading statements. We make only faint and belated efforts to set the record straight and educate the public about our industry’s true value to people of the U.S.A.

My advice to you is:

Work hard, play hard. In my observations in several companies during many decades, the most creative people were the ones who were always “turned on” — whether at the office or at gatherings outside the office.

M. Ray Thomasson



Career history

- 1959 Ph.D. in geology, University of Wisconsin (B.S. and M.S., University of Missouri)
- 1959–1976 Shell Oil Company, where I worked as both a geologist and a geophysicist. Positions during that time included manager of geologic research; manager of the Texas, Louisiana, and Atlantic offshore division; manager of forecasting, planning, and economics; and head of strategic planning for Shell International Petroleum Corporation, London, England. My last position with Shell was as chief geologist for Shell Oil U.S.A.
- 1976–1990 Various positions, including vice president of exploration for McCormick Oil and Gas, Inc.; president of Spectrum Oil and Gas, Inc.; president of Pend Oreille Oil and Gas, Inc.
- 1990–present Thomasson Partner Associates, Inc. (founder)
- Board of trustees and past chairman of the board of trustees of the American Geological Institute Foundation
- President of the American Geological Institute

- 1987–1988 Distinguished lecturer on stratigraphic geophysics in carbonates for the American Association of Petroleum Geologists
- 1995 Distinguished Service Award, AAPG
- 2003 Honorary member, AAPG
- Past president of AAPG
- Distinguished Alumnae Award, University of Missouri
- Distinguished Alumnae Award, Geology and Geophysics Department, University of Wisconsin

My proudest accomplishments

After 43 years in the exploration game, it is difficult to pick one major accomplishment. I am most proud of having been fired twice from jobs as president of companies and not letting it slow down my career. This past 13 years of building Thomasson Partner Associates into a superb exploration organization with an outstanding staff and an outstanding track record has been both a significant challenge and a great pleasure.

My biggest disappointment

Each dry hole seems worse than the last one.

Anecdotal story

I was having lunch with my Shell mentor Mr. R. E. (Mac) Adams, who was 84. He had retired from Shell at 60, had successfully started and sold two previous companies, and had just started his third company. All of a sudden, he hit the table with his fist and said, “Damn, Ray, I wish I had 20 more years” — but not to do the things retired people do. He wanted 20 more years to explore for oil and gas. That is how I feel.

My advice

Never give up. Because of the ups and downs of our business, it is easy to lose faith that it is really worth the effort. Success, however you decide to measure it, is worth great effort. However, you must make it a wonderful ride, because the journey is more important than the destination.

Jack C. Threet

Threet Energy Inc., Houston, Texas



Career history

- 1928 Born in Dundas, Illinois
- 1951 B.A. in geology, University of Illinois
- 1951–1987 Shell Oil Co.
I started work in Tulsa, Oklahoma, as junior stratigrapher and rose to vice president and head of exploration, from 1978 until my retirement, in 1987. I worked on technical and managerial assignments in numerous cities across the United States and in Holland, Australia, and Canada.
- 1953–1955 U.S. Army, Korea

My proudest accomplishments were:

As a young geologist (aged 28) at Shell, I single-handedly found South Autwine Field (~5 MMBOe) in Kay County, Oklahoma, a stratigraphic trap in lenticular Pennsylvanian sands, with subsurface geology (no seismic).

As vice president of Shell Oil Company's international ventures in 1974–1978, I led our small staff of exploration geologists and geophysicists into select new exploration ventures with early major success (several hundred million barrels each) in countries such as Cameroon, Syria, and Sabah (Malaysia). These discoveries materially added to Shell Oil's production and reserve base.

As corporate head of exploration for Shell in 1978–1987, I led a staff of as many as 600 geologists and geophysicists into exploration opportunities both at home and abroad. I am especially proud of having headed a team that led Shell into the Gulf of Mexico

deep water. There, as "true pioneers," we acquired an early, dominant acreage position and led industry for many years in discoveries and production of oil and gas, particularly in ultradeep water.

At the time we plunged, there was considerable uncertainty that even with exquisite geophysics and geology, commercial quantities of hydrocarbons could be found. In fact, Shell's discoveries proved huge and profitable and have had a major impact on the company's production levels, reserves, and earnings.

My biggest disappointment was:

I was general manager of E&P for Shell Australia in 1970–1972 when, as a partner in a joint venture, we drilled the discovery well at Rankin Bank, a huge structure in shallow water on the Northwest Shelf of Australia. In less than a week, our excitement turned to disappointment when the thick hydrocarbon-bearing sands we saw in drill cuttings and cores from the well were confirmed to be gas/condensate pays, not oil pays. As an oil field, Rankin Bank would have been one of the world's largest, and immediately profitable. As a gas field, although still large by international standards, Rankin Bank would take more than 20 years to prove its economic value.

An anecdotal story

My experience in business and in life generally may well be an example of how one should never underestimate one's ability, regardless of circumstances. One such example follows:

I remember vividly that hot June day in 1951 when I arrived in Tulsa by coach on an overnight train from Saint Louis to report to Shell, for \$300 per month. Inexperienced, broke, and alone (my wife had stayed in Illinois to work), I walked, suitcase in hand, from the train station to Shell's office. I reported to area exploration manager R. E. McAdams, recognized by many as Shell's toughest taskmaster. Somehow, I managed to get through that session with "Mac." From that day on, I knew that no assignment or problem could ever present a larger gap between the task at hand and my perceived ability to deal with it successfully — a philosophy which served me well during those 36 years at Shell and is still doing so.

My advice to you is:

While in school, get a solid education in the basics of geology, geophysics, and petroleum engineering. With such knowledge, you will rightly develop a "can-do" attitude. After graduation, join an E&P company, small or large, but make sure it is a company that does not just pay lip service to the technology you can bring to bear. Instead, make sure as much as you can that it is a

company that will recognize and consistently apply your expertise in making exploration investment decisions.

After experience and success with that company, you can elect to stay and rise to higher levels of responsibility or to go out on your own, confident that in either case, you will succeed.

Acknowledgments

In Shell Oil Co., I had dozens of mentors, including many well-known personalities such as R. E. McAdams, head of Shell's Exploration Department for much of my career and to whom I obviously owe a lot in the advancement and success of my career. John Bookout would certainly be another mentor, without question. However, I truly believe the most valuable yet least well known of all my mentors was my very first one at Shell — J. Rex McGehee.

When I joined Shell in Tulsa as a junior stratigrapher, inexperienced and fresh from the University of Illinois, Rex was area stratigrapher. A seasoned pro, he immediately took me under his wing and patiently taught me, one-on-one, how to "run" drill cuttings under the microscope. More important, he convinced me that although making accurate sample logs was apparently mundane, it was extremely important and valuable. "So always do your very best to do it right," he said.

That job I did for my first two years at Shell was part of a team effort to build formation correlation sections across the then very lightly explored Williston Basin. I know for a fact that many of my sample logs remained in Shell files and were regularly used by Shell geologists for at least 30 years.

Gene Van Dyke

President, Vanco Energy Company



Career history:

Born November 5, 1926

- 1947 Mud engineer during college on Kerr-McGee's Ship Shoal Field offshore Louisiana, industry's first oil discovery out of sight of land
- 1950 B.Sc. in geological engineering, University of Oklahoma
- 1950 Geologist, Kerr-McGee Corp., Oklahoma City, Oklahoma
- 1951 Geologist, S. D. Johnson, Wichita Falls, Texas
- 1952 Independent producer and operator, Wichita Falls, north- and west-central Texas
- 1958 Van Dyke & Mejlender, Houston, exploring and developing oil and gas fields of the upper Texas Gulf Coast and southern Louisiana
- 1962 Formed Van Dyke Oil Company, active in southern Louisiana
- 1967 West Lake Arthur, Louisiana, discovery; reserves 2+ TCF.
- 1973 Company's activity shifts to North Sea; purchases 25% interest in Tenneco's licenses offshore Netherlands
- 1982 Rijn discovery (P/ 15), 40 MMBO reserves, later 400 BCF discovered
- 1983 P/9 discovery, later named Horizon Field

- 1997 Awarded the Anton & Astrid Marin permits offshore Gabon, beginning Vanco's era of deep-water exploration offshore Africa
- 2001 Vanco Gabon Group drills offshore Gabon in world-record water depth of 2791 m
- 2002 Active offshore African countries, with more than 20 million net acres under license

My proudest accomplishment was:

In the last several years, I have led my company into deep-water West Africa, where we have become the largest license holder, with more than 26 million acres. We have acquired 2-D and 3-D seismic and have found more than 50 major structures.

My biggest disappointment was:

Our last dry hole.

My advice to you is:

Educate and train geologists and geophysicists as explorationists who emphasize exploration in deep water, because this is where the remaining significant reserves are to be found.

J. C. (Rusty) Walter III

Career history

Born 1957

- 1980 Degree in geology from the University of Texas at Austin
- 1982 Master's degree in business administration from the University of Texas at Austin
- 1982 Joined father to form Walter Oil & Gas Corporation, serving as vice president
- 1988–present Chairman and CEO, Walter Oil & Gas Corporation

My biggest business accomplishment

My biggest business accomplishment to date has been my involvement in the discovery and operation of the South Marsh Island 36/37 (1989) field and the West Delta 106/107 (1993) field. Combined production from these two fields to date is more than 211 bcf of gas and nearly 19 million bbls of oil. We continue to operate these two fields, which produced approximately 50 mmcf/day and 3000 bbls of oil from about 12 wells (2001).

My biggest disappointment

My biggest disappointment would have to be the gas-price crash in February 1992, when gas fell below \$1.00 per mmcf. We had to put several properties up for sale to pay down debts in a terrible market for sellers. Fortunately, the price rebounded in the fall, and we canceled the sale as gas reached \$2.50 per mmcf!

My advice is:

Do not follow the crowd. The oil and gas business is extremely cyclical, and there is no better competitive advantage than to make sure your financial situation lets you play this volatility to your advantage. Having money when prices are low means you get your pick of the best prospects, leases, deals, etc., and during this time, drilling costs are at their lowest. We always strive to expand our business when things seem their worst.

Robert J. (Bob) Weimer

Career history

Born September 4, 1926, Glendo, Wyoming

- 1944–1946 U. S. Navy
- 1948 Married Ruth Carol Adams; four sons, Tom, Loren (deceased), Paul, Carl
- 1948 B.A., University of Wyoming
- 1949 M.A., University of Wyoming
- 1953 Ph.D., Stanford University
- 1949–1953 Union Oil of California, Rocky Mountains, Canada, west Texas
- 1953–1957 Consulting geologist, petroleum exploration for stratigraphic traps
- 1957–present Colorado School of Mines
 - 1965–1970 Department head
 - 1958–1983 Getty Professor
 - 1983–present Professor emeritus
- 1961 Visiting professor, University of Colorado
- 1967 Fulbright lecturer, Adelaide University, Australia
- 1970 Fulbright lecturer, University of Calgary
- 1975 ITB, Bandung, Indonesia
- AAPG president and Sidney Powers Medal, 1991; Distinguished Educator Award, 1996
- SEPM president, 1972; Twenhofel Medal, 1995
- AIPG Parker Medal, 1986
- Member, National Academy of Engineering, 1992
- ISEM Hedberg Award, 2001
- Honorary member, Nigerian Mining and Geoscience Society, 1992
- Honorary member, Canadian Society Petroleum Geologists, 2002

My proudest accomplishments were:

Personal: Marrying Ruth and watching the growth and successful careers of our family; educating full-time students at the Colorado School of Mines and other universities; offering on- and off-campus short courses for 25 years to more than 2500 people from more than 40 companies (the course: stratigraphic principles and practices in petroleum exploration and production).

AAPG: Assisting Dan Busch in starting and lecturing in the Continuing Education Program; being president of AAPG and of SEPM; helping to plan and

implement the Division of Environmental Geosciences; being selected twice as an AAPG Distinguished Lecturer and as the first Huffington lecturer to south-east Asia.

Professional: Discovery of stratigraphic-trapped oil and gas in Green River and Powder River Basins, Wyoming, in the 1950s and 1960s.

My biggest disappointments were:

After the above discoveries, recommending prospects in the 1980s and 1990s that were dry holes.

An anecdotal story

The following summary is a story about oil and gas discoveries that have four components: an informal partnership to finance regional stratigraphic studies to find drillable prospects; a creative geologic model for petroleum fields in stratigraphic traps in Cretaceous rocks; a company willing to take a high-risk exploration program; and a high standard of ethics that acknowledged and protected the creative efforts of individuals and companies.

New pipelines and successful deep drilling to the Mesaverde Group on anticlinal structures created a high interest in gas exploration in the 1950s on the western margin of the Washakie Basin and the Wamsutter Arch. Mesaverde production was established on closed anticlines at Sugar Loaf (1953), Canyon Creek (1954), and Table Rock (1954).

Most companies initially prospected in these areas using conventional structural leads (i.e., closed anticlines or faulted noses). In 1954, however, Chester Cassel and I applied stratigraphic-trap concepts to these areas and other Rocky Mountain basins. Our approach integrated subsurface data with outcrop work and used an exploration model of predicting linear shorelines in areas where hydrocarbon entrapment could occur without structural closure. This model was developed from Cassel's two-year study of Mesaverde gas production at the giant Blanco Field in the San Juan Basin, and from studies of shoreline sandstones by API Project 51 along the Gulf of Mexico.

By early 1956, I had developed a play north and west of Table Rock Field, based on projection of shoreline trends across Wamsutter Arch. Exploration targets were the productive transgressive shoreline sandstones of the Almond Formation (upper Mesaverde, Table Rock Field) and the regressive shoreline sandstones of the Fox Hills Formation. Forest Oil Company, through recommendations of Don Lawson, George Veronda, and Jim Barlow, purchased the prospect and available lands during the summer of 1956. Forest later formed the Arch Unit (21,514 acres) and then drilled gas and oil discoveries. Producing acreage on the Arch Unit

later became the north half of the Patrick Draw and the southern third of the Desert Springs Field.

Two surprises came out of the drilling — first, the large oil occurrence at Patrick Draw in what previously had been regarded as a gas-prone area, and the large area of stratigraphic-trapped oil and gas, an anomaly in the region, which was known for small accumulations on anticlinal closures.

The stratigraphic concepts related to shoreline trends, proved by field development in the 1950s, are still used as analogs for exploration and development programs in the deeper portions of the Wyoming basins.

More details about “selecting the prospect area, selling the deal, and unitization, drilling, and discovery” are presented in the paper “Stratigraphic plays of the 1950s on the Wamsutter Arch: Wyoming Geological Survey Guidebook — Resources in Southwestern Wyoming,” 1995, p. 1–11.

The above-described prospecting work was followed by exploration in the Powder River Basin in the 1960s that led to discovery of the Manning Ranch Field, and royalty interests in the Spearhead Ranch and Powell Units.

My advice to you is:

Since retiring from full-time teaching at CSM, I have continued to do consulting work and prospect generation. I follow the advice that I pass on below.

- Never stop dreaming.
- Never stop doing.
- Never stop thinking.
- Never stop learning.
- Never stop being grateful to those who paved the way.

Acknowledgments

In a free society, opportunity and the avenue for success in a chosen professional career are provided by the continuity of universities, corporations, and governments. As institutions, they continually encourage education, application, and transfer of knowledge, and especially participation by youth — the next generation. This happened to me.

Opportunity started with service in the U. S. Navy during World War II, followed by earning geology degrees at the University of Wyoming and Stanford University. At Wyoming, I was guided and influenced by Professors Don Blackstone, Sam Knight, and Bill Thomas, and at Stanford by Sy Muller, a protégé of Hugh Schenck, and Fred Humphrey.

My professional career in industry grew by the

direction and friendship of Horace Goodell and Dan Merriam, in consulting work from Chet Cassel and Paul Pustmueller, and in academics at the Colorado School of Mines, from John Haun, L. W. LeRoy and T. H. Kuhn.

And last, the greatest contribution to my success has been Ruth and our sons.

To all of the above and to many unnamed friends and former students, I acknowledge your support and extend my deepest gratitude.

Cindy Yeilding

BP America, Inc., Houston, Texas



Career history

- 1960 Born in Dallas, Texas
- 1982 B.S. in geology from Southern Methodist University, minors in art history and anthropology
- 1984 M.S. in geology from University of North Carolina
- 1985–1994 BP, Houston, Texas; exploration, operations, development and production geologist
Hired as a carbonate specialist, then worked well-site operations for 1.5 years (longest continuous stint one month offshore). Moved to offshore development/production, where I planned development wells and recompletion programs and (the most fun of all) worked as Amberjack (MC 109) sanction geologist. More well-site work. Gulf of Mexico exploration from 1989.
- 1995–2001 BP, Houston, Texas; subsurface team leader, deep-water Gulf of Mexico, Venezuela Exploration and Geophysical R&D
Team leader for several Gulf of Mexico Exploration Teams, a joint BP/Amoco Venezuela exploration team, and a seismic R&D team. Focus on acreage acquisition, regional studies, new play analysis, prospect generation, and drilling. Tested five deep-water prospects. Team led on three discoveries (Thunder Horse, Thunder Horse North, and Blind Faith) and had two failures.

Member of two technology-award-winning teams — one for breakthroughs in 3-D seismic depth imaging and one for drilling advances in the deep-water Gulf of Mexico.

2001–present BP, Houston, Texas; global geoscience technology manager, Upstream Technology Group (technology unit leader)

My current job is to create opportunities for the R&D geoscience team to deliver significant business value for BP. The main roles include setting vision and strategy for geoscience technologies, providing links to the business, and promoting and evolving the role of UTG and new technologies across our company. Another key aspect of my job is to steward geoscience R&D projects and technical networks.

My proudest accomplishments are:

Professional: Being part of a team which conceived of and successfully tested a new play.

Personal: Tyler Anne Yeilding Donovan, born February 3, 2001.

My biggest disappointment was:

Becoming complacent, by simplifying geology.

My favorite story

There are so many ... but my favorite learning experience was when I worked on Mississippi Canyon 109 (Amberjack, Gulf of Mexico) as the sanction geologist. We had a wonderful small integrated subsurface team (Wayne Wilson as geophysicist, Tom Morrow as reservoir engineer, and me as geologist) working on the big decision: Do we develop this discovery or not? The project was described as “break even” at best. Our partners even gave us their 50% interest in the block after five penetrations — they just couldn’t see how we could turn a robust profit.

We had a wonderful subsurface story — a strong geologic model (which still holds up today), an excellent data set, and multiple models and risk scenarios for development planning. It was some of the most exciting geologic work I’ve ever been a part of, but no matter what we did, the economics were dangerously “break even.”

Meanwhile, the facilities engineers were busy planning for a tension-leg platform, because conventional wisdom dictated such a platform as the facility required to develop petroleum in 1000’+ water depth. We were still struggling to find a way to assure profitability. Then a relatively inexperienced engineer (Thyl Kint)

asked a simple question: “Why not a conventional platform — just in deeper water than we’ve done before?”

Well, his idea worked. The platform was designed and built, expanding on proven techniques — at a significantly reduced cost of development and significantly improved economics. Suddenly our little baby was robustly economic, all thanks to a surface guy thinking “outside the box.” He was immediately hired away by a competitor, and has hopefully gone on to engineering greatness.

What did we learn? To question — always question — conventional wisdom, and to explore every aspect of a project, whether it is in our area of expertise or not. Ask the “dumb questions” such as “Why can’t this work?” Sometimes the simplest question (such as “Why can’t we do something?”) can lead to amazing breakthroughs.

My advice to you is:

- Integrate, integrate, integrate.
- Work with multiple models/interpretations.
- Learn how to communicate uncertainties to your peers and others.
- Realize that most things are not as simple as they appear.
- Seek experience and expertise, ask for advice, and share your ideas.
- Be persistent!

Postscript

In putting together this book, those of us on the committee realized that anyone who has been in this industry for more than 10 years has stories or advice worth sharing. In our many committee meetings, we shared some of our own stories, and in doing so, realized that they should be included as well.

So what follows are our summaries. They are included not because we see ourselves as legends, not even in our own minds, but because our stories do contribute to our heritage — as do your stories. It is our hope that someday you will have the opportunity to share your stories with someone, so that you too may add your own piece to the rich tapestry that is the heritage of the petroleum geologist.

Robert C. Shoup

Career history

1955	Born in Winona, Minnesota
1978	B.A. degree in geology, Winona State University
1980	M.S. degree in geology, University of Oklahoma
1980–1994	Shell Oil Company, New Orleans and Houston
1994–1995	Shell China Petroleum Company, Beijing
1996–1999	Shell Deepwater Inc., New Orleans
1999–2002	Samson Offshore Company, Houston
2002–present	Hilcorp Energy Company, Houston

My proudest accomplishments

One of my proudest accomplishments to date involves drilling a discovery on a prospect that some individuals had previously condemned. The prospect consisted of a large structural nose trapped against a salt mass. There was amplitude support; however, the amplitude abruptly terminated along the strike of the structure. Where the amplitude was observed, it had a reasonably good fit to structure. Because of the observation that the amplitude did not extend across the whole structural nose, several previous workers had condemned the prospect.

The horizon tied to a reservoir that was the major pay in several fields around the same salt-withdrawal minibasin, and I was sure that I was seeing pay here as well. To convince management to drill the well, however, I had to explain why the amplitude terminated as it did.

I mapped the event in detail, picking every trace and line. I mapped the loops above and below the event, and with regional isopach maps, I reconstructed the evolution of the minibasin. I demonstrated that as the reservoir was being deposited, two separate salt wings merged at the prospect. As the salt bodies sutured, there was a significant steepening of the dip along that flank, triggering a mass wasting event that erosively removed the reservoir from the west flank of the structure. Because of the detailed mapping, you could even see several scallop-shaped regions along the margin of the slide, where slope failure had occurred.

After I explained why the amplitude had terminated, management approved the well. On Christmas Eve 1997, the log came in with more than 90 feet of pay. That was one of the neatest Christmas presents I've ever had.

My biggest disappointment

My biggest disappointment was in having to return early from our assignment in China. We were very fortunate to have had the opportunity to live in China. When we learned that we were going, we decided as a family that we wanted to use this opportunity to learn about another people and culture. So when we arrived, we sought and made many Chinese friends.

My biggest challenge there was to learn how to work effectively with the team from China National Offshore Company that was assigned to work in our office. They had very different work habits and priorities than we did. Nevertheless, by working with them and learning and respecting their culture and opinions, we established a very strong and friendly working relationship.

We had been in China for almost two years, during a very dynamic period of change in that country. We had a great time and learned a great deal. So when Pecten, U.S. Shell's international subsidiary, decided to cut back its program in China and recall us to the States, all of us were deeply disappointed.

Anecdotal story

My most memorable well-sitting experience was on a prospect called Rodan. This was a great prospect, a sure thing. The prospect was characterized by a strong seismic amplitude with a very pronounced fit to structure. Seismic sequence analysis indicated a correlation with sand-prone facies, and gas chimneys were observed along adjacent faults. We solicited several partners, all of whom considered this prospect to be a "slam dunk."

Most logging runs seem to occur on weekends and in the wee hours of the morning, and this well was no exception. So it was that at 2:00 o'clock on a Sunday morning, I was sitting in the "company man's" office watching the LWD. As the gamma-ray tool crossed the objective, it dutifully kicked to the left. The resistivity tool lagged behind the gamma ray by 10 minutes, so I still didn't know if we had pay. Finally, after a very long 10 minutes, the resistivity shot to the right. Eureka, we had pay! The gamma ray was still showing nice clean sand, so this was promising to be a big well.

I started to do a quick reserve estimate in my head, when suddenly the resistivity shot back to the baseline. This couldn't be — the gamma ray was still in sand. Maybe there was a small shale break the gamma ray had missed. But no, the resistivity never went back up. We had found 9 feet of pay on water. In 4000 feet of water, that was the same as a dry hole.

All too often, the well that is a sure thing or

declared to be a "slam dunk" ends up being a cement storage facility. There is always uncertainty.

My advice

Be active in your local geological society and/or AAPG. Serve on committees, run for office, and become certified. You will find that through this service, not only will you grow professionally, you will also make a great number of professional contacts. This network will prove invaluable during your career. If you ever want or need to change companies or to know who is buying good prospects or selling one, this network will be your single best resource.

Acknowledgments

As I mentioned in the introduction of this book, I am truly grateful to Blair Parrott. Not only did he help me find shark's teeth, but with his guidance, I learned how to slip logs, how to properly use paleo, and how to predict reservoir. From Billy Frank, I learned how to correlate seismic and make maps, and from both of them, how to find and present good prospects. From Dr. John Donovan at Winona State and from Dr. John Wickham at OU, I developed and nurtured my long-lasting love affair for geology, an affair that continues to this day.

I am grateful to my father, Robert Shoup, from whom I learned the true value of professionalism and the realization that what you get out of life is proportional to what you put in. Within the AAPG family, I thank Don O'Nesky for the same reasons, and Norma Newby, Donna Riggs, Vickie Beighle, Michelle Mayfield, Randa Reeder-Briggs, and Diane Keim for all the help they have given me over the years.

In addition to those I have mentioned, I have been inspired by people whom I have been privileged to have known through the years. Although the list is longer than I can include here, some of the most notable are Chuck Roripaugh, Jim Hartman, Rufus LeBlanc, John Karlo, Doug Beckman, John Amoruso, Jim Lewis, Pete Rose, Jim Gibbs, Bruno Hanson, Bob Cowdery, Toby Carleton, Deborah Sacrey, Charles Sternbach, and Michel Halbouty.

Finally, I am grateful to my wife and children, whose love keep me going and whose spending habits keep me working.

Deborah K. Sacrey

Career history

1953	Born in Oklahoma City, Oklahoma
1976	B.S. in geology, University of Oklahoma
1976–1978	Gulf Oil Company, Midcontinent District, Oklahoma City
1978–1981	Michigan Wisconsin Pipe Line Company, Oklahoma City
1981–1986	Consultant, Oklahoma City
1986–1989	Chief geologist, Peko Oil/Week Exploration, Dallas/Houston
1990–1991	Consultant, Paramount Petroleum
1992–present	Consultant/independent, Auburn Energy

Proudest accomplishments

I have many proud accomplishments, one of which is having been responsible for finding \$100MM value of gas in the Queen City play in south Texas. I am also proud to be involved in various activities in the AAPG, where I have met some of my dearest friends and most respected mentors.

Biggest disappointment

My biggest disappointment is a really expensive 15,000-foot dry hole I caused to be drilled on top of Wilburton Mountain in southeastern Oklahoma. I was a junior geologist with about five years of experience in the Arkoma Basin, and I just knew this was going to be a huge discovery in the Spiro Sand. The old adage of “never fall in love with your own prospects” proved to be true!

An anecdotal story

While working as a consultant for Paramount Petroleum, I developed expertise at drafting and “packaging” prospects in the Gulf Coast. After Nuevo purchased Paramount, I was released from my consulting agreement. With little Gulf Coast experience and with virtually no jobs to be had, I used these skills to open a drafting company. Within four years, I had six employees and was “packaging” deals for many independents in Houston.

It was the connections made from the drafting company that led to much of my 3-D consulting when I put my workstation together in 1996, and I have been busy with interpretation work since then. Now I am in a position where I have partners to purchase leases/seismic, and I take working interest in wells we drill.

My advice to you is:

Network, network, network! The time and effort I have put into various organizations not only garnered me wonderful friends and mentors, but the “public” exposure and willingness to work brought fiscal opportunities as well. In addition, make use of the skill sets you have, regardless of how “low” you think they are. You never know when your toe in the door at one level will lead to greater opportunities at another level.

Charles A. Sternbach

Career history

Born 1957

1980	B.A. degree in geology, Columbia University
1981–1984	M.S. and Ph.D. in geology, Rensselaer Polytechnic Institute
1984–1997	Staff geologist, Shell, Houston
1997–present	Jordan Oil and Gas, Houston

My proudest accomplishments to date include the following:

I am involved in some exciting exploration programs whose outcomes are pending. In the meantime, I would have to say my proudest accomplishments include being the exploration geologist for five new gas field discoveries (reserves exceeded 100 BCF) as a new hire at Shell during rejuvenation of the Michigan Basin in the mid-1980s, when subtle deep structures produced gas from Prairie du Chien sandstones. This was a great taste of success for a young geologist.

It was a thrill to have been able to evaluate exploration potential of 35 producing properties in the Permian Basin through the eyes of an explorationist at a time when 3-D seismic was new. It also helped to rescale the engineer's maps from 1:500' to a grander 1:8000' (or larger). New reserves were found, and a significant corporate effort ensued.

My desire to assemble trend plays has led me to create and pursue significant opportunities in the Lodgepole, Cotton Valley, and other onshore reef plays where I have played important roles in raising capital exceeding \$25 MM. I am drawn to reefs by my education and because they are rich targets suitable to projection along trend using carbonate geologic insights.

I am proud of having capitalized on educational opportunities, from public education at Stuyvesant High School in New York City to completing both my M.S. and Ph.D. in three-and-a-half years at Rensselaer with a 4.0 GPA. I have also been proud to serve in professional societies: HGS president at 41, Legends programs (2000, 2003), co-general vice chair AAPG 2002 (Technical Program), and Discoverers of the 20th Century (with Marlan Downey). The Legends and Discoverers programs and this Heritage publication mean a lot to me because we should honor our forebears.

My biggest disappointment

My biggest disappointment was searching for another Wilburton field (400 BCF) in the Arkoma Basin and not finding one. By careful study of the trap components of Wilburton, it became clear to me that more than 100 dry holes in the basin, including dozens of industry dry holes drilled after Wilburton, lacked the critical fault-seal requirements that Wilburton possessed. Although finding hydrocarbons is always more fun than not, by realizing this critical insight early, we added only one "data point" to regional control where we could have added many. And maybe someday this work will help us find a future opportunity.

Anecdotal story

"Something hidden, go and find it!" Back in my early Michigan days, I met and became good friends with an old scout named Jim. Among Jim's many assets were a handshake so firm he could bring you to your knees, and the fact that he had been around long enough to know the early history of the basin. On one of his visits to my office, he told me "Find the old stratigraphic tests," and left. When my fingers recovered enough to dial, I set off a series of phone calls and made subsequent visits to files. After prolonged frustration that can come from trying to find things long hidden in company files — Eureka!

These records enabled use of a classical technique. By contouring a shallow marker bed from stratigraphic tests, I found a structural flexure that identified a deeper and subsequently productive gas field. Other such discoveries followed. Lessons learned: (1) Listen to the old guys, and (2) things such as stratigraphic tests may be "low tech," but use whatever works.

The independent life. I've always admired resourceful and determined independents, like many whose stories are included in this book, who started with nothing and wound up with something. So when I was among a fortunate few who piled into a Lear jet to review a reef play with legendary explorer Tom Jordan at his northern California office, I took notice. One morning, long after we had met, I was a guest at his winery. I was considering various career options and was in a reflective mood. As the sun rose over vineyards and singing birds, I said to myself, "Good-bye (name of former company), hello Jordan Oil and Gas!" I had resolved to join the independent ranks. Six years later, it is still a great honor to work with Tom Jordan, Dick Vincelette, Gary Griffith, and Bruce McClellan on the Jordan team.

Compound interest of lifelong friendships. I have found that friendships long maintained bring great pleasure and can enhance your life, often when you

least expect it. One happy story occurred a few years ago when my Ph.D. professor Gerry Friedman called. He had introduced me to my wife, a fellow geology student, and had attended our wedding, now close to 20 years ago. I think it meant as much to me to be able to thank him by writing his Sidney Powers citation as it did to him for him to receive the award!

My advice:

My advice is to be aware of opportunities created by changing conditions. Good exploration stories, especially those in mature areas, have “a twist.” Something obvious now might not have been seeable, sought, or available earlier. Restrictions resulting from politics, technology or mind-set often change. Old seismic data and well records can be valuable when processed with new software or fresh ideas. And because we often get what we look for, we might as well be bold and think big!

Maintain “outward focus.” By regularly attending HGS and AAPG meetings (I estimate about 300 talks during 15 years), I have been privileged to hear about new plays, discoveries, and exploration techniques by those who made them happen. Make a habit of attending society meetings, taking courses, and shaking new hands.

Cultivate a good memory by active learning and staying curious in many subjects. It seems to me that (1) the more I learn, the more I want to learn, and (2) memory improves with use. Creating good files and folios can help. Read extensively, including Levorsen, Pratt, Degolyer, and especially everything Michel T. Halbouty has ever written!

Seek and keep good friendships. They are the greatest gifts in life.

Richard L. Nagy

Career history

Born September 7, 1952

1976	B.S. degree in geology, San Diego State University
1977–1978	Mud logger for Borst & Giddons Well Logging Co.
1978–1980	Graduate geology studies, San Diego State University
1980–1982	Development geologist for Phillips Petroleum Company
1982–1989	Exploration geologist for American Petrofina Co.
1989	Consulting geologist
1990–2002	Exploration Geologist for Phillips Petroleum Company
2002–present	Exploration geologist for ConocoPhillips

My proudest accomplishments

I consider my proudest accomplishment to be a very encompassing continuity of focus and determination that has aided me in being successful professionally. Not only in the technical side of performing a geologic evaluation or study or drilling for oil and gas, but over the years, I have been rewarded by many friends, colleagues, and associates throughout the oil business. They have given me many great experiences that have helped me to grow as a person and a professional. A good example of this was being asked to join with the other editors of this publication to help in bringing about documentation of the wisdom of some of our profession’s legends.

On a personal note, I also consider my wife, Debbie, and three children, Erin, Jeff, and Erica, and their growth as something I am very proud of.

My biggest disappointment

I have always somewhat regretted not finishing graduate school and attaining a master’s degree in geology, but it was a decision I made at the time.

I can’t think of a single big disappointment in my professional career, as far as drilling goes. Of course there were many “learnings” that I’ve experienced and then said, “Boy, I’ll never do that again.” There were times when I wished I could have convinced my management to follow up on my recommendations, but I’ve always had the attitude to live and learn and move on.

Anecdotal story

One of the themes of this publication is the role and value of a mentor in our lives and profession. I can remember my first night as a mud logger — my first job out of school. I was working with a real old-timer. Even though I had looked at plenty of rocks as a student, it was really quite different on the rig, working very quickly to catch samples, clean them, and then do a sample description. By then, it was time to catch the next sample.

At first, it seemed I got everything wrong, from cleaning the sample to describing it, but with the guidance of Stan, I quickly learned, and the job got easier. This same process essentially repeated itself several years later, when Phillips hired me as a development geologist. One of the more senior geologists on the staff used to get into the office pretty early, as I did. He shared many experiences and how-to knowledge with me. During one early morning discussion, I discovered that he knew Stan from my stint as mud logger many years before, and we had a good time with that.

My advice

My advice for all those just entering the business is to never give up on your ideas. Be persistent but be patient. Develop an optimistic attitude, and never stop seeking new knowledge (even if it is from old files). Try to find someone who can provide some mentoring support. Membership in local and national geological societies can also help in developing a network. The AAPG and Houston Geological Society have helped me tremendously in keeping up with the latest technology and exploration concepts, as well as developing a network of mentors and friends to share ideas with.