MMS OFFSHORE GULF OF MEXICO

ORAL HISTORY PROJECT

Interviewee: BRUCE APPLEBAUM

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Bio

Applebaum retired from Texaco following its merger with Chevron. He had been vice president of Texaco and president of the company's Worldwide Exploration and New Ventures. Prior to joining Texaco in 1990, Applebaum had held positions for several independent oil and gas companies, including exploration manager with Sun Oil and Texas Eastern, domestic exploration manager for SEDCO Energy, and division exploration manager for Union Pacific Resources. He was born in Buffalo, NY in 1947 and received a B.A. in geology from SUNY-Buffalo and a doctorate in geological oceanography from Texas A&M.

Summary

Free ranging interview on the general history of offshore exploration from the late 1960s and especially on deepwater developments in the 1990s. Applebaum talks about the coring program undertaken by the "Glomar Challenger" and his expertise in turbidite geology. He covers the history of natural gas exploration on the shelf and its terminal decline, pointing out that deepwater is most important as an oil play. Discusses offshore bidding and bright spots, and offers interesting comments on the history of Texaco and why he was brought in to help improve their exploration program.

Side 1

TP: This is an interview with Bruce Applebaum. Today is November 12, 2002. The interviewer is Tyler Priest. We are at Mr. Applebaum's office in Houston. Why don't we go back and have you fill in your personal background?

BA: Sure. I will start in the beginning. As a lad, I was interested in fossils. In fact, my father and I kicked around some quarries in Buffalo, New York. This was in the 1950s when I was just a sprout, and I kind of got interested in the rocks and understanding where these giant critters that were in the limestone around Buffalo came from. I did not think about that too much, but then this dumb television show, "Seahunt," came on where Mike Nelson was bubbling around with an aqualung. Of course, he was getting into fights with octopuses and getting wrapped up in killer kelp beds, but I was fascinated by scuba diving as well. As a kid, I had training in school and bubbled around in western New York and various places. So kind of I had the idea back then, or had the seeds planted that the rocks and the ocean and the underwater were kind of neat things.

When I went to undergraduate school at the University of Buffalo or the State University of New York at Buffalo now - and got my undergraduate degree in geology . . . but I always thought about the ocean. I went to graduate school in oceanography at Texas A&M and I kind of put the two together. The subspecialty was geological oceanography but that is actually how I got to the Gulf Coast in the

late 1960s. I was in graduate school in College Station in about 1973.

The confluence of most of my work and A&M's work at that time was in the Gulf of Mexico and in the Western Caribbean. I really got involved in the rudiments of seismic and sedimentology and deep ocean work when I was in graduate school. The most interesting part, I think, was being involved in some of the deep water core work that was going on at the time.

For instance, there was a program that is still ongoing called the Joint Ocean Drilling Program, or JODP, that was begun in the late 1960s/early 1970s. It is still ongoing and A&M is still a repository of the cores that are ongoing from that program.

TP: That was a Texas A&M program? Was it sponsored by industry?

BA: It was a joint university program, but industry was very interested in it as well. Some of the first core deep ocean work was done by the vessel called the Glomar Challenger in the Gulf of Mexico. You would not be aware but the deepest part of the Gulf is about 13,000 feet of water which is significantly over your head. But, the cores that were taken in the abyssal plane, the deepest part of the Gulf, around salt domes recovered some gravels in the deepest water in the Gulf where you would not expect gravels. And some of these gravels had oil stain.

TP: Is the deepest part in the western Gulf?

BA: Yes, it is in the western Gulf and, actually, probably in Mexican water. I will show you a map some time that shows you the contours of the Gulf. But these core holes and the things that we did showed some potential for hydrocarbon accumulation. Obviously, you need a source rock, you need reservoir, you need a migration pathway, and you need a good thermal history in order for there to be a hydrocarbon accumulation. And certainly, there was no real industry . . . there was interest, but there was no practical way of extracting hydrocarbons and making money at it back in those days.

TP: You were involved from the early 1970s?

BA: Yes, at University. My work at University was involved with work all turbidites. These are sands that have usually been flushed in the deep ocean basin from river systems. It was thought of as academic at the time because there was no real practical application of this kind of thing during that period of time. The interesting corollary is that the deep water fields that are presently being found are being found in turbidite sands. So, it is really amusing.

TP: That brings up a question: when did people in the industry and geoscientists suspect that these turbidite sands would have hydrocarbons and when did they really begin

to think that they would produce at the rate that they did?

BA: You have hit the real question, and what makes these things so special is the producibility. The ideal production scenario is one bore hole that recovers an infinite amount of production through one riser. That is the idea. That is the perfect state. But no one really knew how well these reservoirs would produce. First of all, they were not found until the 1980s and basically, even though we hear a lot about Shell and the Gulf of Mexico, it was really Petrobras in the Campos Basin that did the original commercial . . .

TP: Those are turbidites, too?

BA: Yes, pretty much. The same sort of reservoir as sandstone reservoirs. But lots of people remained unconvinced. In fact, it took several phases of convincing to get companies, my company included, Texaco, interested in deep water exploration and production because of the physicality, the lack of real engineering expertise, and the knowledge that this was really an expensive environment. It is a lot better to find a giant oil field in 3,000 feet onshore in east Texas or south Texas than it is to find one in the deep water. There are not any . . . or, if there are, no one really knows where these giant accumulations that are untapped onshore might be anymore. And frankly, the reason that people are going into deep water is because those things do not exist anymore because of the extent to which they have been drilled up in most

producing basins.

TP: I did not mean to get you away from the story, but it is interesting that you were working on turbidite geology.

BA: It was totally happenstance. But it was a happy coincidence, I guess.

TP: So, when Petrobras made their big discovery, you could probably understand what was going on.

BA: Oh, absolutely. A lot of this work was going on in the R&D shops in the majors. Exxon certainly had people looking at turbidites, as Shell did, and made the case for these things to exist. What no one knew was that the real key to the kingdom was the producability of these things and how well they would produce.

TP: Had there been any clues or was it just a bold discovery and they did find out it was producing?

BA: It was a bold discovery, but there were clues . . . producability on the shelf, obviously, and sorts of clastics was pretty good. The rest of the story is that there are turbidites on shore that produce. The whole LA basin is basically turbidite reservoir and those things produce reasonably well there. What no one really knew

was the extent and the dynamics of the reservoir systems in deep water. Just a rule of thumb - you have to have a reservoir that will produce over 5,000 barrels a day from a bore hole in order to make it a viable enterprise in deep water. And most companies will look at a worst case scenario. I mean, that is not at $30 a barrel. That is assuming that you are in an $18 or $20 environment because you have to test those sorts of hydrocarbon cost scenarios in order to make sure things will work because you do not plan on this commodity being in a high price range forever. You have got to plan for a lower price range.

TP: It must be nice when you get a 30,000 barrel per day well!

BA: Yes, it is extremely nice, but you have to understand that the first well that we drilled in deep water in Nigeria was an exploratory expendable well. It was on the order of $80 million and it is a totally different world. I do not think that John Q. Public quite understands how costly it is.

TP: Huge rewards but also huge risk.

BA: Yes, absolutely. And you have to have extremely deep pockets in order to sustain dry hole costs in that kind of environment. That is why there are not all that many deep water players except the major oil companies and it is also why smaller companies that venture into deep water more often than not go out of business. The

science is a very difficult environment. In fact, the Gulf of Mexico is an extremely difficult environment because of the dynamics of the salt which, more often than not, screws things up when it comes to imaging these targets.

TP: So, you were at Texas A&M in the early 1970s doing work on offshore drilling. You said that is still ongoing?

BA: Sure. It is funded by the National Science Foundation and some other folks. If you get a chance, the program is still housed . . . in fact, the universities argue about who is going to be the operator of the program. Right now, it is at A&M and they have their core storage facility and all the rest of that stuff in College Station.

TP: Do you know if, in some ways, it was seen as a successor to the Mohole project? I guess they were hoping to develop a lot of drilling technology.

BA: They are related but they are not offshoots of the Mohole Project. That was specifically designed to drill through the crust and find out what is in the mantle. That is not part of my history, so I do not know.

TP: I should talk to some of the Global Marine people about that system, the Glomar Challenger.

BA: Oh, absolutely.

TP: I have talked to several – Bob Bauer and a few others.

BA: Bob Rose is going to have some time to talk about these things very soon. He does not have all that much more time before he retires. I would like to annoy him and sick you on him anyway.

TP: People have given me his name and I think that he is still on the board of the Offshore Energy Center.

BA: I am sure he is.

TP: I should get a chance to talk to him.

BA: He is a super guy as well.

TP: O.K., so after Texas A&M, where did you go on to?

BA: I actually started with Pennzoil for summer jobs when I was in graduate school. It was more necessity than anything else.

TP: I interviewed a former chief geophysicist last week, a guy by the name of John Reilly.

BA: Yes. I remember John.

TP: He was involved when they got a big piece of the Eugene Island field, Eugene Island 330.

BA: Yes, that made Pennzoil. In fact, that is an extremely interesting area. Actually, Texaco had some production in that same field. I do not remember the block numbers but it was a field called Turrin which is, I think, the southern part of Eugene Island 330. It was either 300 or 330. I think it was the 330 field. I am getting off the subject, but that field in particular is interesting because we worked on it at Lamont in New York on charging of the reservoirs.

TP: Refilling them?

BA: Yes, there is some evidence. An interesting guy, I cannot think of his name but he was after me for anything that Texaco could give him and we did, starting with the recharging of those reservoirs.

TP: Was his name Gold, by any chance?

BA: No.

TP: There was a guy named Gold who developed the theory about the origin of oil.

BA: I can see him right in front of my face and I cannot think of his name. I will think of it at about 2 a.m. and I will bolt upright.

But anyway, my experience at Pennzoil was strictly as a summer intern. One summer, I was in Corpus Christi working on some of their onshore stuff in South Texas. I guess they bought United Gas, but this would have been in the summer of 1970 or 1971, something like that. I spent the summer there and then the following summer they offered me a job in Houston, actually, at Bank of the Southwest Tower. I do not think that Pennzoil Place was even built then. I was working international, which was a hoot as well. It was not quite as much as a hoot as it could have been.

TP: So, you did follow up the internship and worked at your position in Pennzoil?

BA: No, this was strictly a summer position. Two years there. I was not smart enough to go to work after my master's - I stayed through my Ph.D., much to my wife's chagrin, having accumulated some financial debt during those grad school years and

having had a couple of children that were not supposed to be there but came along. Anyway, no, I did not go to work for Pennzoil though they offered me a position.

When I graduated in 1973 with a Ph.D., I had several job offers. I thought I was going to be a great academician and stay in the academic route. However, these same urchins came along. I had a couple of offers from schools. One was from the government in Church Street Station in lower Manhattan. I do not even remember who I was with. It was either NOIA or the MMS or somebody. But I remember those offers being in the range of $5,000 to $8,000 or $9,000 a year and Sun offered me a job for $16,000 a year. So, being the intelligent fellow that I was, I decided, hey, well, maybe industry is not all that bad!

I started work for Sun in the Gulf of Mexico in Houston. Actually, it was their offshore in Alaska division, which was interesting. I worked Alaska as well in those early years. I did some field work in Kodiak and had an absolute blast kicking the rocks and stones up there. That really was my initial exposure to the offshore.

TP: How active was Sun in the Gulf of Mexico?

BA: Well, they were reasonably active. They were a big South Louisiana player as well. I did not stay there all that long. This was in one of those wonderful periods in which any one who could spell geology or geophysics was being thrown bonuses

and cars and things like that. I had worked for three or four independents before I actually went to work for Texaco in July of 1990. I would say 60% of the experience that I had had pre-Texaco was in the Gulf of Mexico. I worked for Champlin for six years as offshore division manager there. I worked for a number of years with Texas Eastern, which was a company who had done some amazing things by being a smart partner. They were a huge player in the North Sea, almost by accident, having gotten into bed, so to speak, with Mobil, Amoco, and who else? Mainly, Mobil and Amoco both on the U.K. and Norwegian sides. They were huge players in Burrell field and Montrose. They had production in the chalk on the Norwegian side. They also had a significant position in the Gulf of Mexico that I had charge of as well. I think they had a 20 or 25 year contract with Gulf for something like 30 or 32 cents an mcf that was a really good deal for Texas Eastern and a really bad deal for Gulf.

TP: Joe Pratt, as I mentioned to you, did a history of Texas Eastern.

BA: Right.

TP: The Brown brothers.

BA: Yes, the Brown brothers and actually, it was made by the war, these Big Inch, Little Inch pipelines that went up to the East Coast.

TP: So, you were with Texas Eastern some time in the mid 1970s?

BA: Yes, the mid 1970s to the early 1980s. And then, they were bought . . . probably decided to get out of the E&P business. They wanted me to stay and not be in the E&P business . . .

TP: One part of the history that we have not really explored much is the gas side of the Gulf of Mexico. Most people talk about the oil discoveries, but gas was a big deal at the beginning of the late 1950s.

BA: Gas was an extremely big deal. It is an extremely big deal now. It is a very interesting commodity. It is one of those things where the futures market does not quite understand what the resource is all about. It is always cycled through how much gas is in storage, how cold the winter is, and all of these kind of short-term forces of the price of the commodity. The real issue is how much is left and where is it coming from? That was long-term. Right now, if you have fun with the MMS and look at their statistics, the Gulf of Mexico is in terminal decline on the gas side. There are no players of any magnitude left on the shelf.

When I retired to Texaco, I had a couple of foreign groups asking me to start an E&P company on the shelf Gulf of Mexico. I said, "Yes. Save your money." The

exploitation has been so efficient there. Small blocks turn over every four, five, six years. It has all been coded with three or four generations of 3D. There is no technologic advantage that anyone has in the Gulf and that is why there are so many little companies that popped up and were able to do some interesting things. But the point is, there is not much meat left on that bone and the few companies that are still there are making money on smaller and smaller and smaller things. And the rest of the story is that in the deep water, it is basically an oil play. There is not that much gas being found.

TP: No, there is not much?

BA: No. I was amused by some discovery that was made, I think it was by Kerr-Mac and Ocean on the shelf or in modestly deep water, 3,000 feet or so. They are hoping for 200 bcf. Unfortunately, my first watch, I guess you would call it, was at Texaco in the early 1990s. When I had production and exploration in the Gulf, there was a marvelous field called the Tiger Shoals which had produced 2 tcf or 3 tcf - I do not recall exactly. And on my watch, water hit it. But my point is really that this is 3 tcf or so in shallow water which sustained Texaco for a long time in the 1970s, 1980s, and early 1990s. And here, people are getting excited about 200 bcf in the deep water. And there is a whole scaling change that is going to be . . . it is interesting, it will make money for the companies that have found it, but in the long run, especially at the production rates that you are going to be able to get out of that, it is not going

to affect the decline in gas producibility in the Gulf.

TP: Texas Eastern was strictly for gas? They were not into oil?

BA: Well, they were not all that fussy but the idea was that it would be nice to have your own equity gas to put in your own pipeline and pay yourself and not have to pay the middle man. All the gas companies at the time had E&P arms. I mean, Texas Gas, Tenneco. Look what grew up out of Tenneco.

TP: Yes, we talked to Joe Foster.

BA: Joe is a good fellow.

TP: He gave us some of that story.

BA: When they write books about business, when you see the silliness that enshrouds some companies, there is no question why they are not around any longer. Here is a perfectly fine company - very, very successful, excellent oil and gas company, and what do the executives do? They sell off the good things and they keep the trash. And in this case, I guess the guy's name is Kettleman, he kept the farm machinery business, harvester, because that is what he came out of. That is what he knew. The rest is history. Good-bye company.

TP: So, you said you were at Texas Eastern until the early 1980s? So, you went through the deregulation.

BA: Yes.

TP: How did that affect what you were doing in the Gulf of Mexico?

BA: Well, you were talking about gas versus oil. If you are at 32 cents an mcf, you are not too anxious to find a lot of that stuff because it is not going to pay the bills. Again, you are talking about emergence. And oil, at the time . . . this was post the OPEC strikes . . . you are beginning to see a little gain - whatever it was - eleven bucks a barrel or whatever. Things are starting to change. The dynamics are changing a little bit on the oil side. But obviously deregulation of the gas market was the beginning of the efficient exploitation of the resource. People always cry for open market forces being the most efficient way for any business to work and certainly in the case of gas, that is the way it played out.

TP: So, from Texas Eastern, you went to Sedco?

BA: Yes, exactly. From Texas Eastern to Sedco and this was in a period in which Sedco was deciding that maybe having some equity in their business would be a good thing

rather than strictly relying on the drilling business. This was in Dallas for a couple of years until they were bought out and I managed their offshore.

They had made a whole ton of money on I believe it was Marathon stock. They had bought a whole bunch of Marathon during a period in which there was this aggressive fight for reserves and I do not remember who was after Marathon, before the steel company bought them. I think it was Mobil. But, they made a few hundred million dollars just buying the stock of this company and watching the predators go after it.

Getting back to Sedco though, they had made a discovery in the Ivory Coast. They had an equity interest in the field called Espwar which turned out to be not so wonderful, but they thought it was wonderful because they tested 12,000 barrels a day. It turned out they made the discovery in what was probably the only oily portion of the entire field, and that field is still, I think, probably not producing where maybe the gas market in West Africa is. You want to find oil there, you do not want to find gas; it is as simple as that.

TP: There were no outlets.

BA: Right. But they did have some joint ventures in the U.S. and south Louisiana and a little bit offshore which we dabbled in more than anything else and tried to do a few

things. Mostly, the mentality of a drilling company is because it is such a cyclic business. They are really risk adverse. It was difficult to do anything in any meaningful way to change things. I was there for a couple of years and then Schlumberger bought Sedco.

TP: I cannot imagine how people survived with their nerves intact in the drilling business. If you look at it over time, it is just wild swings.

BA: I do not understand it. I do not understand investing in the drilling business. I understand people have been able to survive and make a living but as a business per se, we are kind of hopping back and forth from decade to decade. But in North Sea right now, the drilling business is dying. In the Gulf of Mexico shallow water, the only thing that is sustaining things is that you have got four buck gas now and we have never been smart enough to know that that is not going to last. You do not drill now because the gas is at four bucks. It may or may not be four bucks when these things come on stream. But the drilling business is really tough, as is the seismic business unless you have got the capability to drill in deep water in these extraordinary deep water environments and you are well-equipped to do that. A shallow water drill has got really severe problems these days as they have always had. It has always been a matter of oversupply and then consolidation. That has been the whole history of the oil and gas business in the U.S, for the most part . . . overexuberance, silly money leading to silly things, and then consolidation.

TP: Can you talk about being an explorationist in the early 1980s and the move to area-wide leasing in the Gulf of Mexico and how that impacted what you were doing?

BA: Well, the area-wide leasing was probably a great boon to the country because it meant a lot more acreage was going to be leased and looked at.

TP: At a point when there was a moratorium on drilling out in California.

BA: Right. That led to some silly bids there as well. That is another story and it is coupled with unrealistic expectations for the price of crude. You made a bid thinking as we did in those days as well as everyone did in those days that the crude would be $90 by the turn of the century. Nineteen dollars a barrel, you can make some really high bids. The company with the dumbest assumptions won, which meant that they lost! It is as simple as that.

TP: Well, I know Shell spent a lot of money on leases in offshore Alaska.

BA: Yes, the Gulf of Alaska was a real disaster as far as they hydrocarbon province was concerned. It was an unbelievable disaster. So, I have been rambling. Where were we?

TP: We were talking about area-wide leasing.

BA: My point was that it was a wonderful boon to the government. When you had nominated sales, somebody put up a couple of blocks and then, you know, Joe Blow could look at a map and see that someone had nominated it and take a hard look at it himself. And all of a sudden, you wound up with lease sales in which you had 8 or 10 people bidding on the same tract because basically it is a sale in which the prospects were identified.

The tracts were rationed and the prospects were identified, so we built a hell of an auction when those things became available. It was not a good thing. It may have been a good thing as far as the coughers of the MMS was concerned, but it was not a good thing as far as the country and the health of the business because of those limiting factors. You did not have a lot of acreage being looked at. You did not have it being looked at intelligently. And you create a scenario in which a company had to spend a lot of money and really bid when they won those tracts while everybody beats their chest. Have you ever been in offshore?

TP: No.

BA: You need to go to New Orleans and just get a feel. It has changed these days because you get a bunch of small companies who are bidding in shallow water and

they are all thumping on their chest because they win a bunch of blocks for minimum bids which means that no one else is really interested in their acreage. But in the old days, winning a bunch of blocks was a game unto itself. They would make these grand announcements about all the acreage that they had won, with no real direct relationship with the prospectivity of the acreage that they may or may not have acquired.

TP: There seemed to be a large variety in the way that companies approached and evaluated it. My main experience comes from studying Shell. I know they were very scientific about it and they had all sorts of risk discounting, but I do not think that all companies approached it as rigorously as Shell.

BA: One of the many interesting things about offshore bidding in those days, as well as these days, is that the price of the lease bonus that is usually insignificant when you look at the price of development . . . the half billion dollars or the billion dollars or whatever, I am more thinking of the deeper water now but if you look at any risking program, it shows that you can bid anything. You can bid almost anything because those numbers are inconsequential compared to the development cost.

TP: I suppose you had a pretty good idea of what structures were and then an even better idea with direct detection. Do you think that had an impact on driving up lease prices?

BA: There is no question that bright spots drove up the price; the lower the risk of the prospect, the higher the price. The closer that you can get to predicting what the future is, the higher the cost in any endeavor. There is absolutely no question.

TP: That must have been a wild and crazy period.

BA: It was. And just going to one of those offshore sales, you like to beat your competition. Every company would sit together with a half dozen or a dozen people, and they would all be writing these bids down as they would come out. There would be whoops and hoops and hollars and everyone liked a bid in which you beat your . . . there is a $2.1 million bid and you outbid your closest competition by five bucks. This was great stuff, for good, bad, or indifferent.

TP: I have interviewed John Rankin.

BA: John Rankin would be a great guy . . .

He would. Great stories there. But the most embarrassing thing in the world would be a company would make an $80 million bid on a block and then the next would be $600,000. Mobil did that on one block that I can recall in particular. Heads would roll! I mean, absolutely roll! Because you had to understand your competition in

how perspective a lock was also.

TP: That is a lot of money to leave on the table.

BA: Yes, that is a big hole to step out of when you are trying to commercialize a field as well.

TP: O.K. Take us into the 1990s, into the deep water and when you eventually came to Texaco. I am interested in hearing about Texaco's whole offshore strategy. I think you intimated earlier that looking at West Africa and the Gulf of Mexico by the time . . .

BA: Well, it was a consequence of arriving at a time when things were not going all that well at Texaco. They had emerged from Chapter 11. They had the Carl Ichan incident in which he was trying to buy Texaco and dismember it, and they had a shareholder vote in order to see whether or not they would do that or stay together.

Yes, it was the Getty/Pennzoil thing. So, this was a fairly wounded animal, probably saved by a fellow named Jim Kinnear who is still, in my mind, the epitome of what a CEO ought to be. He has written a book that no one will read called "The Man Who Wore the Star." I might have a copy of it at the house. That would be interesting. It was basically a compilation of the speeches that he had given during that crisis

period and how the company was held together. And there is a lot that the current CEO should have been reading about character, of which they have a deficit. But, that being what it was, it was a tough time.

I was working for Champlain at the time, or I guess it was called UPRC by that route. They had closed their Houston and Denver offices and were consolidating in Fort Worth. The railroad oil companies were born out of the fact that Abe Lincoln gave them a railway that was specifically designed to give them the rights to the timber so that they could build railroad ties and build their lines through there. But it gave them all a checkerboard mineral rights all through the Rockies and all through the west.

I moved the family to Fort Worth from Houston then they closed the Houston office and consolidated. Fort Worth was not exactly our cup of tea. I was looking for a way to get back to Houston, when this opportunity, through a fellow I knew, popped up with Texaco in 1990. And though it was not Houston, New Orleans looked kind of interesting, especially running an operation as large as Texaco was offshore in New Orleans. So, we moved down there. We were there six years. But the things that I had inherited were like Tigar field hitting water - 13 year production decline and actually, the reason Texaco got into trouble was the fact that their resource base was deteriorating to the point that they had to do some extraordinary things.

End of Side A

Side B

BA: Texaco had to do some extraordinary things because of the fact that their production base was declining and deteriorating rapidly. That was the whole reason for their getting into the problems that they were in with Getty, for instance. They needed to make an acquisition. They made it with all the problems that ensued with the lawsuit.

There were lots of companies like that. Unocal is a prime example right now. If you go back and look at what they looked like then versus where they are now, it is stunning to see how they have shrunk. And that, in my mind, and of course I am an unabashed explorationist, is due to the fact that Texaco in particular had been remarkably unsuccessful in their exploration efforts. They had a portfolio that was full of old, old fields, legacy fields that had been found in the 1940s and 1950s. South Louisiana. Big oil fields were peering out, and it was by and large that way across the board.

TP: In your view, why was Texaco unsuccessful? Was it because they relied too much on Aramco for so long?

BA: That is part of it. You are seldom good at things that you do not focus on. Texaco was a remarkable refining and marketing company. Unlike Shell, which is a

company that I do admire, it was not driven by the science and the resource. Most of their management came out of the military and they were mainly marketers. Their great venture was marketing in all 48 states. They thought this was the greatest thing in the world. Of course, we look at that now and laugh at the silliness of it, but that is just an example of their lack of attention. And then they got into Aramco and, basically, the CEO at the time who I think was McKinley, said, "Why do we need to explore? There is more oil than we will ever need and it is under our control so what is the big deal here?" with no real foresight as to what the commodity could do or the fact that you needed a multiplicity of sources in order to mitigate any problems that you might have with any one of them.

This was premodern. The modern answer is portfolio, portfolio. You have got to have a lot of different things and you have to be able to sort through them in a rigorous sort of way in order to bubble the best things to the top and to drill. There is no one best prospect. You have to drill the portfolio prospects in order to be successful. Texaco, for instance, had missed out on the North Slope and apparently had the opportunity to participate and chose not to. And, in fact, I think the folklore is that they chose not to because of this huge supply of crude that they had in the Middle East. There may be some folks that can fill you in on that. Despite that, Prudhoe Bay was found and everybody was upset that Texaco was our participant. So, what did they do? They launched head first into Mukluk which is one of the legendary dry holes in all of industry annals.

TP: Was Texaco more exposed than most companies?

BA: Yes. Texaco, I think, operated the Mukluk well. This is before my time but I was at Sun when Mukluk was drilled, and Sun was a big participant in Mukluk as well. I remember the looks on the division manager when he went into the boss' office after the logs after the Mukluk came in. It was not a happy thing.

TP: Shell was in that, too. That was a real sore spot then.

BA: Oh, yes. It does not always work. And when you think you know the answer, that is when you had better sit back and rethink because with any set of data, there is a multiplicity of outcomes, and just because you are very sure that your outcome is the one that is going to happen does not mean that it is.

We will go back to bright spots as a for instance. Just because you have got a bright spot does not mean that you have got a gas royal accumulation. There are other things that can create that bright spot. It lures the probability of failure, but unless you have got a group of those things, a portfolio of those things, if you just drill one of them, you are killing yourself. It goes back to portfolio theory, I suppose.

TP: So, Texaco had the big failure with Mukluk?

BA: Yes, I was actually kind of an anomaly at Texaco. They never hired from the outside. In fact, I do not know anyone else during that period that was brought in from the outside, but I had established a reasonable reputation to be into the fine production, especially in the Gulf through my previous career. I was brought down to New Orleans as the outsider in this totally inbred culture, which was a difficulty in and of itself. All of these large companies were totally inbred, totally secretive, and frankly, knew very little about the competition. Or they knew enough about the competition to be able to effectively come up with a strategy that included - there are the rocks, there is the technology, there is the competition, and there is the market. And they could not really deal that well with the competition except to raise their fist and shout things. And that goes on today. I mean, the majors still do not like each other a lot. BP and Shell, in particular, come to mind.

TP: One of the popular stereotypes is that they are all in bed together.

BA: Oh, God no! The jealousy . . . it is the little boys and the little boys' behavior becoming big boys. I hate to sound sexist, but that is what it is. Becoming big boys' behavior. There is a true dislike, especially with those two companies. It is really interesting.

TP: It is partially the British heritage going way back. And the secretiveness. How do

you explain it? Is it a function of being a large organization or that it has been so criticized and crusaded against over a period of time?

BA: I think it is the paranoia that results from everyone disliking you. It is true. I think that goes for oil business in general. I mean, it is not a beloved industry to start with. Any time they tried to explain themselves, they got pilloried. And rather than expose yourself to being pilloried, well, why do not we just not say anything? That was the mentality years ago. It was not the 'okay, let's go the analyst route and tell them what our strategy is and explain our business to them. In fact, that probably did not happen until the analysts started looking at their stocks and saying, "Tell us, enough," and they started getting bad reviews in the press. So, there was probably a positive knock-on affect from the business journalists and the industry analysts. But it still goes on. They still compete. They still talk about each other behind their backs. It is healthy but I do not think a lot the general public understands that collusion is now what these guys are all about. They want to win. They are built to win. They are programmed to win and they want to win.

TP: You really see that when you look at exploration.

BA: You do. I had a kind of different attitude. A lot of times, companies are joint ventures. I mean, they are in the same groups. And we were among the first companies in the Gulf of Mexico to have intercompany teams where we would all

address a problem in a producing area. I recall that we had one with Occi and then on the offshore Louisiana, we had a group with Conoco and Arco. CAGC it was called originally - Conoco, Arco . . . it must have been Getty that . . . it was before Texaco. And Cities which became Occi. We put together intercompany teams there so that four different companies did not have to go back to their individual hiding holes and replicate each other's work. We put together teams that would do that work and present it to a management team which helped us out tremendously.

This was a change in management style as well. I mean, all of a sudden, companies started sending their best and brightest to business schools to learn techniques from other industries.

TP: You are talking about the period in the early 1990s?

BA: Yes. Late 1980s, early 1990s - a lot of that was going on. I went to Cornell in the summer of 1987. Those are good things, any time you get in with industry colleagues and talk about how business has done and look at case studies. It is nothing but healthy.

TP: Of course, when you get into deep water you are talking about a whole lot of capital and more joint venturing, and the need to share information about how to develop these things - big, expensive projects.

BA: Yes. Just getting back to Texaco. The teams were formed in the early 1990s. Basically, you are gauged on how much production you pulled out of the ground. Texaco had had some great assets that had been worked for many years. But at the same time, I went forward to management and said, 'Hey, look, sooner or later, we are not replacing reserves that we are taking out of the ground. And the less we get an aggressive exploration and/or acquisition program going on, we are going to be in a world of hurt! The technology was advancing at the time as well. So, we relooked at old fields and started applying a horizontal 3D'ing. Obviously, on the fields that we had there are lots of bypassed production and pay.

We began the 3D'ing of these old fields. We started employing directional drilling, horizontal drilling, to increase productivity. We had the first subsea completion and tieback in a project called Shasta which was kind of a precursor to the way things were done in the deep water. Now, you have got kind of pod system, hub-and-spoke system that began that.

TP: So Texaco was one of the first to experiment with this?

BA: I do not think that anyone can take the credit of being first. The technology really developed early. There were a lot of folks that were applying horizontal drilling onshore. We were among the first, if not the first, to do offshore.

TP: What were Texaco's holdings offshore? Are you talking mostly about the shelf or also deep water?

BA: At the time, deep water was not an issue. Texaco really did not have anything in the deep water.

TP: So, it was not until Auger came along . . .

BA: It was not until Auger came along. In the early 1980s, Shell was dinking around and spending money and Texaco as well as other folks were kind of going, 'They are sure spending a lot of money and they are not finding a heck of a lot that makes a lot of sense.' But in looking at holdings and putting the whole thing together, it became fairly clear that the industry, and we in particular, had to move into the slope and the slope was a precursor of moving into the deeper water.

TP: Where would you rank Texaco in offshore? The top companies, I guess, at that time would probably be Shell and Exxon?

BA: I think that at that time, I admired Shell the most because they were doing the things that would lead them to future success; doing the Augers and amassing the deep water inventory at these offshore sales that would lead them to their later success.

Texaco was not a leader in moving into uncharted territory. There is no question. We had to give them a kick start in order to move into the deep water arena. You have probably heard this story from your conversations at Shell, but Shell brought in BP on their coat tails. This is a subject for a whole another lecture.

TP: The Mars project.

BA: Yes, in Mars, the interesting thing was that companies that had a lot of production on the shelf, albeit with the exception probably of Shell, were interested in the deep water but were still making a lot of money on the shelf. BP came in, and soon after they got into the Gulf they got rid of all of their holdings on the shelf. In their own minds, they said that the only thing that is going to be worth our time and effort is going to be deepwater, which was a remarkable and clairvoyant decision on their part. But they were not hindered, if you will, by a bunch of infrastructure and production and by a history on the shelf. And they parlayed that into a remarkable series of success!

TP: They did not have the same kind of inertia.

BA: Exactly. They could look at it without a history. So, I think it is good to bring in someone who does not have a history to look at a problem clearly. And they made a very wise decision in not getting bogged down there or onshore either.

TP: And Texaco, you would say, was one of these companies that had a history?

BA: A huge history in south Louisiana, a huge history on the shelf.

TP: Where was Texaco's most key fields on the shelf? Can you remember any of them? I am trying to envision a map of the Gulf and where certain companies were the strongest.

BA: Shallow waters . . . State waters, Louisiana. Huge fields that continued along to this day. But that was their backyard and that was really their bread and butter. Yes, that was definitely their core. There is no question. State Lease 42, I think it was called, or something like that.

TP: That is good. That is interesting, the point you made about the companies with a history versus those like BP that did not. And Shell which was driven by a different set of imperatives.

BA: Sure, and talk about competition between the Dutch company and the U.S. company, which was a whole another story. That had to impede the progress of the whole company as well. Evolution is usually successful. Well, I will not get too philosophical, but certainly that consolidation helped the general push of the whole

company.

Speaking of Shell, one of the things that we did at Texaco was that we had lots of pockets of expertise around the globe and when we decided that the deep water was the thing that was going to benefit the company greatly, we consolidated the expertise that we had in Latin America, which was headquartered in Coral Gables; not a smart place to do business, but a lovely place that we all enjoyed visiting. Actually, Latin America and West Africa were run out of Coral Gables. I do not know what the history is there, but it was an interesting choice. We brought that in. We brought the Gulf of Mexico in from exploration from New Orleans to Houston and North Sea bits and bobs. With Brazil and other things we consolidated in one place because it is basically about the same sorts of clastic systems that we talked about earlier. It was an environment in which people could bounce many things, often common problems, in seminars and so forth and really started to do things right when that started happening.

There are all kinds of arguments for dispersed entities versus consolidated. This was a case in which we gained a lot of power by bringing those things together. The production was left in the producing areas, but the exploration was brought in so that these guys could bounce common ideas off each other. And that turned into a very powerful thing that led to successes in Trinidad, Brazil, and the deep water Gulf and West Africa, in particular.

TP: You are talking about the risk contacts in exploration in offshore Brazil? It is still mostly Petrobras, isn't it?

BA: It was Petrobras up until the time that their government equivalent of the MMS said, 'We are opening this up. This can no longer be a monopoly.'

TP: How much did they open up?

BA: They opened up considerably. Their contract terms are not the best in the world, but they had their first opening to western industry in, it must have been 1999. It must have been 1999 when they had their first sales and competitive licensings open to industry in general.

TP: I am trying to understand this industry in an age of globalization. This is a good way because we are starting to look at the whole world and find similar geological environments.

BA: Globalization has affected this business greatly. How to compete with foreign entities. Why it makes more sense to have native indigenous people versus expats in the countries that you are in. A lot of companies did not get that for quite a while, even until recently. I mean, you look at your bottom line and how much it cost to

have an expat in country versus training an indigenous workforce and it is staggering as well. But evolution is a marvelous thing. It is working. There is no question.

TP: Texaco still faced incredible constraints. You can be as aggressive as you want in these deep water frontiers and still there is not enough.

BA: True, and that is where relationships become important. We sought Petrobras as a partner in Africa, in Nigeria, because we had designs on Brazil. And they happily accepted our partnership in Nigeria. And, it benefited Texaco's entry into Brazil.

I have a young colleague at StatOil now that is running . . . I think I mentioned StatOil's exploration. I was reading on the internet this morning that StatOil has formed a collaboration with LukOil in the Russian portion of the Caspian and also in the Pechora Sea, which is the Bering Sea. And it is the same sort of thing. It is the relationships being in with people who have control over the resources that you have to be more aware of now than ever before because as the North Sea matures the majors are moving out of the North Sea. As the Gulf of Mexico shelf matures, the majors have moved off of the shelf except for some ideas about new things and old places. But at the end of the day the production rates are going to decline. There is some mitigation, but you have to be looking at other things.

TP: It seems you also have this huge uncertainty and that is Iraq, right? If the war comes

to pass, who knows what the whole postwar scenario will be like. But, there is a huge amount of oil there and the world has got to be thinking about that.

BA: There is not only a huge amount of oil but if you talk to any major oil company who has done their homework you will find that not only is there a huge amount of proven oil but there is still spectacular exploratory potential in Iraq. In Iran as well, but Iraq more than Iran.

TP: I guess you do care a little bit about that.

BA: Yes. I am rambling, but it is awfully tough to make money in the Middle East anymore. The Arab world is smart enough to know that they can squeeze and squeeze and squeeze because they have got the resources. And the foreign investors are going to make some cost of capital sort of rate of return, if that. But they have gotten smart enough to know that they are in control. And here is Iraq, with the possibility of U.S. protectorate. I do not even know what you would call it. In the place that all of the world's major petroleum geologists know is . . . well, aside from Antarctica, but that is never going to happen . . . is one of the last major underexplored areas of great hydrocarbon oil potential.

TP: And with all of the oil that has already been proven there.

BA: It is. Absolutely. Texaco did a lot of work on that in our frontier group. I have got a book here someplace. It was an AAP publication on the places in the new millennium that are going to be available. There it is right there, "future petroleum provinces." I am still miked up, but I will give that to you in 5 minutes or so.

TP: It is sort of interesting to speculate about how things are changing so rapidly.

BA: Yes, it is the world's most interesting business, from a geopolitical viewpoint, and I think Daniel Yergin would probably agree from a geopolitical viewpoint, from a scientific viewpoint, from a commodity viewpoint. It is absolutely fascinating: the wars, the politics. But, if you don't understand the resource, it becomes rather meaningless.

If you look at the government takes on worldwide basins, the best contract terms that you can find are in Switzerland. They are the best because the potential is the worst. It is highly unlikely that anyone will find anything. And conversely, the worst contract terms are in the places that oil is usually most abundant. There are some exceptions to that, but it is kind of a truism.

TP: Well, the North Sea seems like a place where contract terms were fairly good.

BA: Yes, they were, but they did a very strange thing. At a time when their production

was on a decline and the U.K. was going to be a net importer of gas the next couple of years, they slapped an increased 10% revenue tax on production there, which is exactly opposite of what you would expect they would do in order to stimulate more exploration and production.

TP: I guess I was thinking about the early days. I do not know much about the leasing system in the North Sea, but I should probably learn more about that in comparison with the Gulf. Would you say tracts were obtained on a more favorable basis there than in the Gulf?

BA: Not necessarily from an economically more favorable position, but the concessions are much larger. And that was good for the original license holders because they can hold them for 40 years. And, in fact, this is something that I address on an almost daily basis because exploitation has been very inefficient there because this acreage does not turn over.

There are some other things. We were talking about the majors holding each other hostage and, in this case, it is tariffs on the infrastructure. They try to gouge each other for bringing production across their infrastructure, which is amusing, but is not very productive when it comes to exploring the resource. It has been very different there. They experimented with lease bonuses and, basically, the U.S. is an auction. In the U.K. now it is work program plus knowledge of the resource and the

prospectivity of what you are applying for. I think on the Norwegian side, it is still a loose bonus. But the terms are so bad on the Norwegian side that they do not get new entrants.

TP: The point you made about infrastructure, you must see that a lot in the Gulf now because the big companies have the TLP hubs and the pipelines.

BA: Well, Shell was brilliant in their two-pronged approach in the Gulf of Mexico and understanding that if you control the infrastructure, things will be found. If you place them in intelligent places, you ought to be able to make good money on that piece of the business as well as on the work producing portion of the business. And they were excellent in identifying hub roots and controlling pipelines and infrastructure, especially from the deep water. Very smart.

TP: Well, I do not want to keep you too long. I know you have got to run to your lunch, but if there is anything else you want to add, I suppose we can always continue this some other time.

BA: I do not know what your timeframe is, but if there are some things that need buttoning up or summaries then we might do that.

TP: Well, I will turn off the tape now and thank you for your time.

THE END