MAGNOLIA OIL COMPANY

ORAL HISTORY PROJECT

Interviewee: ROBERT HIRSCH

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Bio

Mr. Hirsch went to Texas College of Mines at Texas Western (later University of Texas at El Paso), and briefly worked for Magnolia in 1953. He went back to school and graduated with degrees in physics and geology. He worked for Mobil on seismic crews and geophysical research in his early career. Later, he worked in various capacities throughout Mobil including exploration manager in 1972. He left Mobil in 1976 to join Superior. In 1980, he left Superior to form Conquest Exploration Company where he stayed until 1990.

Summary

This interview covers the evolution bright spot technology (hydrocarbon indicators) in great detail. It also covered his early experiences on seismic crews, various state and federal leases, partnerships with other corporations, and a discussion of Mobile Bay. He also has significant information on geophysical contractors.

Side 1

TP: This is an interview with Mr. Robert Hirsch at his home in Navasota, Texas, on November 26, 2003. The interviewer is Tyler Priest. Let's just start with a little background.

RH: I actually went to work for Magnolia on a seismic crew in 1953. I was in college at the time.

TP: Where did you go to school?

RH: I was at what is now University of Texas, El Paso. At that time, it was Texas Western College. It had been Texas College of Mines. At the time I was there, there were about 2,500 students. Anyway, I quit school, looking for a job. I went to work for Magnolia on a seismic crew working in New Mexico. I went back to school and got degrees in physics and geology in 1956 and went to work for Magnolia on a seismic crew in Winesberg, Mississippi – land crew. I was there, and then the crew moved to Rosenberg and Victoria, Texas. And then, in the spring of 1958, I was transferred to Dallas, working for the head of geophysical research for Magnolia, Dr. Al Musgrave.

TP: How did you get into geophysics?

RH: Well, I was interested in a job outdoors. I was 19 years old when I went to work on a seismic crew. I thought the work was interesting.

TP: Was that offshore?

RH: That was onshore.

Anyway, 1958 . . . then worked for Al Musgrave, Dr. Musgrave in Dallas. I was there, I think, a little less than one year. Almost a year.

TP: Was he the head of research?

RH: He was the director of research. I was on a special project. There were not very many of us at that time. There were only three or four in the whole department at that time. I did not like research very much. I did not like the pay.

Anyway, I went to a Mobil marine crew, seismic crew. They had a seismic crew offshore almost continually since the 40s. They shut it down but they started it back.

A crew that was kind of famous in Mobil is seismic Party 13. I joined that January 2, 1959. At the time, we were working offshore Florida. Not too long after having moved back to Morgan City, Louisiana, I worked offshore Louisiana getting ready for the next drainage sale which was August of 1959, as I recall.

TP: Why was crew 13 so famous within Mobil?

RH: Well, it was THE marine crew . . . it was a difficult job. Lots of innovations were going on and they spent more money than any other of the several crews combined. Offshore was becoming increasingly important to Mobil at that time.

Anyway, we worked that drainage sale in 1959, and I think I was involved in every sale from then until I left Mobil in 1975. All of the Gulf of Santa Barbara sales, the East Coast sales. Just a little touch of the Prudhoe Bay sale, but in one capacity or another, I think. The one exception maybe was the 1966 Louisiana sale. Cause I was at Texas at that time.

Anyway, I was on the crew through the 1960 sale, was transferred to New Orleans as staff geophysicist. I went back to Morgan City as party chief of the marine crew in early 1961. We also had a research crew that was attached to us, so we had actually two crews – a regular seismic crew and a research crew.

We worked through the 1962 sale, Louisiana, and then we took the crew to Santa Barbara Channel on the West Coast. Took the boats down through the Panama Canal. It was a fascinating experience. The way to get papers . . . . most of the people were from South Louisiana. Many did not write English. They spoke English. In the process of getting papers, we found out that the birthdays were wrong and their names were wrong and all kinds of things. This was an experience for everybody. But we worked the Santa Barbara Channel. To my knowledge, the first conventional crew to work Santa Barbara Channel and that was in 1962, late 1962. Before that, the West Coast operations had used some antiquated technology, if you will, even for that period of time – what they called L spreads.

TP: Can I go back to the 1960 and 1962 sales because those seemed to be watershed sales in the Gulf of Mexico. Is there anything that you remember, especially about the 1962 sale, although I know that the 1960 was a big one, too.

RH: Well, the 1960 sale, from a Mobil standpoint, we had a couple of problems in that we had some water depth restrictions the engineering fraternity had decreed that you could not make money -- think it was in the 1960 sale -- it was water over 200 feet. And there was not much for that sale outside of 200 feet, but it allowed some companies who wanted to buy some property further out, that gave them a little bit

of an advantage for several years actually. The 1962 sale, we had restrictions to 300 feet. But that was all right. Mobil did O.K. in those sales. Not as well as it did later.

TP: 1962 was wide open over two days. You were able to bid on anything, right?

RH: It was a big sale.

TP: Or they put everything that was nominated up for sale.

RH: Yes. There was a lot that wasn't bought, but there was a lot of cheap property bought out off the deeper water. I know Forest had bought several tracts out in deepwater and Mobil had competition.

TP: That really made them.

RH: Yes, it did make them.

Talking about bright spots, or at Mobil, "hydrocarbon indicators." The first knowledge . . . although they talked about it, the first really specific example came out of the 1962 sale which was South Marsh Island Block 23, which was a very nice gas/oil field. The major producing sand as I recall, 9600 feet . . . maybe 9200 feet –

something in that range – had a strong reflector that corresponded exactly to hydrocarbon pay on a map plotted by the production geologist. At the time . . . well, he was in the development phase of the field, even though there was a court order which was largely ignored.

TP: Do you remember who he was?

RH: Yes, his name was Bob Jacobson. In about 1970, at some point, Mobil moved back as kind of a thank you to that group of people and Jacobson got a bonus that year end of 1971 or 1972 – 1972, I believe, which was a nice pat on the back and a huge surprise for a working long-term career geologist who was singled out with a special bonus like that. It was one of these . . . but it was kind of a neat thing. The executive VP at the time, Holland, he did it and it was a nice gesture and kind of a neat thing to happen.

TP: What did Jacobson say in his letter? He just noticed this correlation?

RH: Well, he went further. He noticed the correlation but he actually went further with a little bit of scientific explanation of the velocity density anomaly and sufficient size that this was what it was. Actually, he was more firm . . . the problem was it got ignored. He wrote the letter. It went from his boss to the exploration manager. He

was in the production department. The head production geologist sent it to the district division geologist who sent it to the exploration manager. The tracts were clear but it was not followed up on. But it got talked about. Not followed up on from a management sense but it got talked about among the troops. And then back in 1966, they actually documented a tract and it was part of the big package although, again, it was not the same degree, the same profile. But it was actually documented as part of the recommendation to bid on some blocks in the Main Pass area.

TP: Because of the correlation . . .

RH: Yes, it was obviously . . . in fact, they were talking about directly associated hydrocarbons.

TP: Do you remember which blocks those were in Main Pass? That is a long time ago, I know!

RH: Yes. If I look at a map, I could probably tell you.

TP: That's all right. I can go back and find out which ones . . .

RH: Yes, Mobil ended up buying them and drilling them. It was a gas cap on oil sands.

TP: And then after the 1966, was this theory accepted yet or not?

RH: Well, it was talked about in geophysical circles but it never really got rolling to the evaluations and all that until later. It did not get to be a big deal until later. And it got to be a very big deal at Mobil later.

I went to Houston in the district division office in 1963. Mobil reorganized and I went to four or six U.S. divisions in 1966, and I became division geophysicist in Corpus Christi. So, I had Texas. And we played with hydrocarbon indicators in the 1968 Texas sale, but we were never able to do anything. We were never able to tie anything down. You know, hydrocarbon indicators do not exist for several reasons . . . one of which, there is no oil or gas there, and that tended to be the situation in the Texas sale in 1968. I became a division geophysicist in 1966. I went to New York in 1968 in a planning job. I went back to New Orleans in the fall of 1969 as exploration manager. So, I was exploration manager in New Orleans from 1969 to 1972. The New Orleans organization went to two regions: one in Houston and I became the region exploration manager in Houston in 1972. I stayed there until 1978. In 1975, I went to New York as corporate exploration manager – a job I held two years and then I went to work for Superior, which is virtually my background.

TP: O.K., well that is interesting. Mike Forrest at Shell first noticed bright spots, I guess it was in the 1968 Texas sale, but Shell did not do anything about it, and it was just an idea that was sort of widely ridiculed, I think.

RH: It was not ridiculed at Mobil, it just never got the management's attention as it should have. Now, as it became a big deal in Mobil, there was a parallel development which was offshore Nigeria.

TP: I was going to ask you about that. Now, about what time?

RH: Well, I left New Orleans in the fall of 1969 and reviewed all of these various things that had happened. I guess I was really the first geophysicist that had become the manager, if you will, and able to bring a little bit of a different flavor to it. We formed a task force.

TP: In 1969?

RH: Yes, the first meeting was in mid- or early December, 1969. Bob Watson, who was a geophysicist, had become the general manager of Mobil's research lab in Dallas. And so, we had a geophysicist to bring that flavor to the research lab. We formed a task force to try to pull all these things together if we could, and I do not remember

when the first . . . we had a small meeting, and there was a drainage sale offshore Louisiana, a Zone 2 sale, in December of 1969, and there was a block in the East Cameron area that was offsetting open acreage that were coming up at a federal sale, which came up in the 1972 federal sale, I guess. Anyway, we had drilled it, and it did not drill like we thought it would.

TP: This was a drainage tract you got in 1969 and then drilled?

RH: Yes. All these things were kind of about the same time. We had a big meeting at Dallas then in early 1970, at which time, we looked at data from . . . we got all the geophysicists from all the divisions together at international and we looked at Nigeria. We looked at Gulf of Mexico data, primarily offshore Louisiana data, and we set a program to look at other things. That task force lasted a couple of years and we ended up looking at probably most of the major fields in the world for evidence of seismic indications of hydrocarbons and porosity and all those things.

TP: You were the one that organized . . .

RH: Well, Bob Watson, me, Al Musgrave and some others. Jim Hohler had come to work for Mobil from Shell at about the same time and he got behind it all, too. I have got to say there are stories out there that he brought it but he did not. In fact, I

think he learned more from Mobil than he did from Shell. Jim was a very aggressive guy and he was very important in Mobil from that standpoint . . . Jim and I became very close. In fact, I had worked for him when I went back to New York. He did not bring the technology. How much he knew from Shell, I was never able to determine. But I think by the time he came from Shell, he probably had not been exposed to very much. Maybe there had been some . . .

TP: When did he come, do you know?

RH: He was there in 1970. Early 1970, late 1969.

TP: I do not think it was until that 1970 sale in the Gulf that Shell really used bright spots.

RH: Well 1970 was a big sale for Mobil. By the time the 1970 sale came along, Gulf was there somewhat at the same with us because we partnered with Gulf in the 1970 sale.

TP: Right. I talked to Jim Bibee a little bit about this.

RH: We had a partnership of Mobil, Gulf, Chevron, and some of the key blocks . . . one

key block was a block at Main Pass again – 170, if I remember the number. But it was ours. Chevron got out. We had three or four big bids on them but we won them. Chevron had got out of all of them. So, we needed a partner. And Ken Joynt, who was my boss, was the general manager and vice-president in Houston. He had been in the Navy with Hugh Liedtke, who had created Pennzoil. I do not know whether you have heard that connection before or not. Jim Bibee and I, we did not know each other very well. We ended up in a motel on the Southwest Freeway and we stayed there almost one week. We had rooms across the hall from each other. And it was apparent to both of us that the other was using . . . I think Gulf called them "direct detectors" or something and at Mobil, they were "hydrocarbon indicators," HCIs, but it was obvious to me that Gulf was somewhere there with us, and it was obvious to Jim we were there somewhere, too. I understand later that their research lab in Hammerville had pulled all this together and what have you. But anyway, we found Pennzoil . . .

TP: To replaced Chevron?

RH: To replace Chevron. We got a call and we went down to a meeting. Pennzoil did not know what the hell we were doing. I mean, we had one of the brightest reflections and their geophysicists who would look at the data were very bothered by that and decided it was something bad rather than something good!

TP: That is interesting.

RH: We bid on hydrocarbon indicators in the 1970 sale. It was primed all the way to the top. All the way to the very senior management because of the task force that had formed . . .

TP: As a result of the work done by this task force?

RH: Yes, because Jim Hohler really got behind it, and other . . .

TP: Now, did Mobil International recognize this in Nigeria or was it when the task force started looking at that?

RH: No. Al Musgrave, who was a Ph.D., research guy, and he was on the task force . . . he suggested that we look into Nigeria, so they brought their data in. And yes, we had suggested to them . . . we looked up the data together, so to speak. He talks about, yes, this is and maybe that is. And Mobil set up their elaborate criteria on how to quantify . . . had to map and terminations had to be sharp . . . it had to fit what you would think a reservoir would do. And I think part of Mobil's success was that very rigid system that was set up. We also started modeling. We modeled the

1970 sale for thickness using fairly elaborate models.

Mobil also were filling the trap of gas oil because of drilling success – had a lot of drilling examples. Our drill examples we had . . . that is why they called them hydrocarbon indicators. We never called them gas. In fact, we said almost from the start that we cannot tell the difference between the gas and oil because 10% gas and oil, looks like gas. And we found out later 10 % gas in water looks like gas. So we never did fall into that trap.

TP: So, Al Musgrave – I hear a lot about him. He was the geophysical guru.

RH: He was initially, yes. And really a super, wonderful guy. I was very fortunate to have worked for him and having been close to him for years.

TP: And so, Mobil picked up good tracks in the 1970 sale with that Pennzoil and Gulf group.

RH: Yes, well, Mobil did well in all the sales, up until Eastern Gulf, I guess, which is a different story. We got with Exxon and Mobil Exxon got in an ego match, or macho thing. We tried really hard to put hydrocarbon indicators on the Destin Dome and never were able to . . . and we told management we were not able to.

But Exxon did.

TP: They did?

RH: Yes. It was a very fortunate thing. Prudhoe Bay, which was one of the early things looked at, once you correct for the permafrost velocity problem and structure, there was a fault system around the flank of it that corresponded exactly with the gas oil mix.

Exxon, at some point in there, was trying to catch up. They recognized that and tried to do the same thing on the Destin Dome some changes down the flanks, there. We were never able to quantify it under our system but . . .

TP: But they ended up bidding . . .

RH: Well, $745,000,000, or whatever . . . Exxon came to Mobil . . . in this whole bidding thing that happened through the 1970s, there were several reasons to take a partner. Actually, there were three reasons to take a partner. One of them was money. Two, was to take out competitor, which sounds like antitrust. Maybe it is, but I heard that spoken. Maybe not because you were not taking all the competitors out, just taking out a competitor. The third was for technical

substantiation which senior management wanted.

TP: You usually just hear about the money.

RH: No, it was technical substantiation. For senior management, that was probably the primary reason, the principal reason to take a partner. Robey Clark used to say Mobil was the biggest whore in town and would sleep with anybody. And we did. We partnered with just, whoever. Over and over . . . we would get our technical meetings and educate the partners in how we saw things. So, they would substantiate our technology at the big table. I know the senior management knew that was happening, but still it was a box you could not pull out of. After the 1968 Santa Barbara sale, Exxon got so afraid of antitrust, that they would not partner with anybody – would not do anything, especially the bigger companies. In fact, it got so bad that they would not even do partnership things onshore.

TP: Shell was similar. I do not know if they were as bad as Exxon but they . . .

RH: That might be but I always thought that was ego on Shell's part rather than . . . but it might not have been. That was my thought. Exxon was just afraid of the . . . but they got Mobil for the Eastern Gulf sale because they were looking for technical substantiation and they were very . . . Bill Holland was their exploration manager.

He was in POGO. I do not know where he is now. He should have been retired. Bill Holland. And Bob Bibee was their senior guy. But John Loftis, who was the director, actually was the one who ran everything.

TP: John Loftis?

RH: Yes. Bill Holland was very honest that they just missed the whole thing on the bright spots and HCI's. They just totally missed it. They were trying to catch up. They came and got Mobil. The Mobil/Exxon partnership was made in New York between Bill Tavoulareas and Ken Jamison for us. And then, they went and got the other partners because Exxon wanted to make it look good. And that was Hamilton Brothers and Kerr-McGee, I remember. But all of them got out, and they should have, because they did not have any business at that table.

Anyway, we did not recognize any hydrocarbon indicators . . . big, nice structure. I was the regional exploration manager in Houston and Graves Noble was my chief geophysicist, a salty old guy. Bless his heart. After the Destin Dome was dry, Henry Holland, who was Mobil's safety vice-president, asked Graves . . . Graves really came down strongly recommending it. He asked Graves, "Graves, what happened? What was wrong?" Graves said, "God fucked up," which was a great answer for a stupid question.

TP: So, there are big structures but Mobil could not put hydrocarbon indicators on them. But, you know, they the had structure to go big on it.

RH: Well, yes, and that big structure in the Baltimore canyon off the East Coast – we came closer to putting hydrocarbon indicators on it although we were not able to quantify it either. But we recommended on that one, maybe we would pass it or it was a very high risk. Bill Tavoulareas said, "We cannot afford to have a big field out there and not have a partner." I think Robey was one to talk about the shadow and the skyscraper.

So, companies do things for nontechnical reasons. The technical people get blamed but there are other real big companies they do things, and you are seeing that now in the Soviet Union and other places, where if one of the other major companies get someplace, well, the others have to be there. That is just the way it is. The Destin Dome got kind of rolled up in that thing.

TP: What was the problem with the Destin Dome?

RH: There was no source rock at the major intervals. The same thing with the Baltimore canyon, the big structure out there. Source problem.

TP: And a similar situation on the Pacific Coast in places, too?

RH: Yes, although especially up in Alaska, there are no reservoirs. There is no permeability in the reservoirs.

TP: The Destin Dome, was that like 1970 . . .

RH: 1973, I think.

TP: That is an interesting story.

How much do you think bright spots contributed . . . you also have the embargo and the price shock which sent bids soaring . . . but do you also think bright spots had a sort of independent influence on the rising dollar value of bids in the 1970s?

RH: Good question. From Mobil's standpoint, we bid hydrocarbon indicators . . . that was our strategy. You know, Mobil spent more during those sales than anybody else. We spent over one billion dollars of Mobil money at those sales in the 1970s. I know a lot of it worked out very well. In fact, when I left Mobil in 1975, it was still looking very good – just projections of the economics off those sales, so it was a

billion dollars well spent, even if you count the disaster in the Eastern Gulf and Baltimore Canyon.

Mobil did a couple of things. There were three pieces. I will get back to geophysics after this. There were three pieces there that . . . there was the bright spot thing that was well documented with good, hard studies of producing fields compared to the seismic data on a worldwide basis. So, there was some really good, strong technology, strong backing from the research lab and scientists all the way to the top. Secondly, when I went to New Orleans in 1969 as the exploration manager, the group had just completed a geological study, a task force kind of thing with some engineers and geologists, of trying to take apart offshore Louisiana fields and try to determine such things as a gas-oil mix which has always been a huge problem – still is, I guess. But also comparison of closure versus hydrocarbon pay thickness and fill-up percents and those kinds of things, so they had really done a pretty major study of producing fields in terms of evaluation criteria, pay thickness, percent of structure fill . . . .

TP: Was this part of this task force?

RH: No, this was done first. It was another task force. It was being completed when I got to New Orleans in 1969, so it was brought into . . . and we are talking about

1960-1962 sales and even earlier sales and some of the better fields had already been looked at. So, there was a lot of geological knowledge that went into this thing.

TP: Did it include onshore as well as offshore?

RH: No, it was primarily an offshore study. It was an offshore group that did it rather than onshore.

TP: Yes, because I remember Shell did a study earlier in 1960 comparing salt domes onshore and what they could really predict to find offshore.

RH: I am sure they did. I am sure that most of the larger companies had done similar things, just based on partnership meetings or what have you. There was a lot of knowledge. The third thing that had played in the 1970s is Mobil had a group in New York called Operations Research which were computer nerds, business computer nerd kinds of people, and they put together a bid model. I do not know whether you have heard about the Mobil bid model . . .

TP: No. Robey might have mentioned it, but I cannot remember.

RH: Well, Robey wouldn't have. People did not believe in it, but it was a good selling

tool. I am not going to get into its accuracy, although the post-sales studies showed some good stuff. But it was something that operations research got behind; the lease sale things, too. So, there was a huge amount of credibility as you went to the sales in 1970, 1972, 1973 – in that group of sales.

TP: So, did the model take into account bidding trends by the companies?

RH: Yes. In fact, there was a lot of stuff that was looked at in terms of bidding. We had developed a strategy that we called our half-bid strategy. It was found out that the company who wins in multi-bid tracts, the winning bid is twice the second high bid. It is a log normal curve. I do not know if you are familiar with the log normal. Everything in nature is log normal. The largest field is twice as big as the second largest field, and so forth. So, it becomes a parabolic curve on which you plot all this stuff. So, we found out when we put our bids, you didn't bid your value or you would overbid by twice. If you did, you were going to be down in here. So, we did not bid half, we bid 60% of our value and winning bids by small amounts. If you go back and look at some of those sales, it is amazing the bids that Mobil won by small amounts. That is the bid model.

TP: That is interesting. And I think there was another study that Arco did about the same time saying bids were way too high. Shell referred to it as "the Arco effect."

RH: Yes, and it was the same number – that the winning bid was twice. They did not go so far as to say the whole curve is log normal, but yes. There was another study, maybe it was the Arco study – I do not remember . . . speaking of things like that, the first recorded mention of hydrocarbon indicators, bright spots, was a 1935 article in *Geophysics* by John Marr. Has anybody mentioned that to you ever?

TP: 1935?

RH: SEG has a publication called *Geophysics*.

TP: John Marr?

RH: John Marr, who was with General Geophysical or one of the large contractors. He pointed out in this article that on any producing fields where the seismic data goes to pot on top of the field, of he postulates that it is because hydrocarbons, that the change of velocity and density, because of the presence of hydrocarbons, is causing the seismic data to go to pot. Seriously. And that is the first article that I know of about this.

TP: That is interesting. Yes, it was not a new idea that seemed to be floating around. I

think that people speculated about it even in technical articles in the 1960s. I know Mike Forrest at Shell said he was reading some Russian geophysical abstracts that mentioned it.

RH: Let me go back on this offshore geophysics. We talk about bright spots but there were some other major technical advances that allowed us to use hydrocarbon indicators or bright spots.

TP: Well, the digital . . .

RH: Yes, the digital. Common-depth point stack. But you go back . . . it started with geophones and the pressure geophone was a major breakthrough. And then, the streamer cable. We probably do not give the streamer cable nearly enough credit because it allowed us to stream and record and reduce that noise hugely and all that. And then came digital. And the digital allowed us to use common-depth-point stack and deconvolution and all these things. So, by the late 1960s, the data was pretty damned good, and there was no reason that we were not using more of the changes in the seismic to tell us more about the subsurface which were hydrocarbon or fluid changes in the reservoirs.

TP: Now, did not Mobil and Texaco sponsor the first digital recordings offshore?

RH: The first digital was Mobil and Texaco together. GSI put out two crews, one Mobil, one Texaco crew. I bird dogged – supervised – the first Mobil crew. I was in Houston at that time and one of my assignments . . . .

TP: This was sort of secret, was not it?

RH: It was secret. And then, Mobil went to digital . . . they brought the GIH missile and but it in some company crews. In fact, in the Texas sale which was in 1968, the Mobil seismic crew was working in Louisiana and so, we took an independent exploration crew and put Mobil equipment on it, personnel on it, and worked the sale that way. In fact, George Cloudy – I do not know whether you have run across him or not – George Cloudy . . . he lives in Casper or somewhere, Billings or somewhere in the Rockies, and last I heard, was still active. But he was the GSI supervisor on the Mobil account.

Another one you may want to talk to about all this was Rudy Prince. Have you run across his name?

TP: I have heard that name, yes.

RH: He was at University of Texas on the faculty over there. He was Digicon. Somehow broke away from GSI and formed Digicom. Cloudy was one of them. But Rudy was kind of the head guy.

TP: Cloudy went to Digicon, too?

RH: Yes. Rudy was kind of the head guy and was very much involved in all this. There was a guy in Houston who was involved in all that, too. Senior moment. Maybe I will think of his name before . . . but he lives in Houston. You would be able to contact him easily.

Rudy also was kind of in this bright spot . . . still is . . . technology and advancement, too. Of course, he formed Digicon and was trying to . . . let me tell you about the Mobil ex's. I am sure you heard some of this dissemination over the technology industry. Mobil probably did more for supporting the technology through industry than anybody else through our partnerships, in other words. A fellow by the name of Norris Harris was in Nigeria with Mobil. And a fellow by the name of Ray Sengbush was at the research lab. George Ball worked for me in New Orleans. He did not work directly for me at that time but he had worked for me directly. They left Mobil and formed Pexicon. Mobil sued them and won a judgment against them. But almost immediately after they formed Pexicon, Amoco hired them. They went

all over and paid big-time bucks to . . .

TP: I think I have heard about this story. This was like right after . . .

RH: This was in 1972.

TP: So, they sort of help disseminate a lot of this technology.

RH: Yes, and Amoco was a partner with Mobil in the 1973 Texas sale, the Texas sale of 1973. They were partners with Mobil in that sale and did not know very much. I think that more as a result of that, they hired the Pexicon guys to . . . the Pexicom guys went all over Amoco and put on these schools. Some others hired them, too, and I do not know just who. I know they did some work for Chevron, some schools for Chevron.

Sengbush was a very talented intellectual teacher. So, the company went under or split, Norris Harris bought the house – *Dallas,* the TV story – the name of that house, whatever it was . . .

TP: The Ewings?

RH: Yes, the house, that was Norris Harris' house. Anyway, he got mixed up with . . . anyway, the company split up and George Ball came back to work for me later when I was at Superior. And then, he went to work for some other people. He is still around.

TP: But Mobil sued Pexicon?

RH: Pexicon. Won a judgment.

TP: Because of proprietary . . .

RH: Yes, but they took data and things and had it . . .

End of Side 1

Side 2

RH: . . . Those were kind of dark days but we did not take anything with us. Mobil hired a University of Houston, maybe it was Houston, maybe it was a Rice professor, that researched the lease sales and we had a trial – we had a 12 day trial. The guy did not

know anything about lease sales. He made his fiscal analysis – very unprofessional kind of job. He really got torn up. The judge ruled there was no evidence of any wrongdoing on the part of Superior and/or any of the . . .

TP: I guess the company just saw the hemorrhaging of people . . .

RH: Yes.

TP: Why did so many people leave – just saw better opportunities elsewhere?

RH: Yes. In our case . . . I was corporate exploration manager when they reorganized and I ended up being manager of technology or something. Anyway, I had the research lab and the data processing center and some other . . . I had a bunch of . . . and I did not like that very much. And then they started talking that I should go to Nigeria. There was no way I was going over there and our kids were in high school, so I got a job offer from Superior in my pocket, and all those things made it attractive.

The technology thing was an evolution that lasted almost from the start, all the way until 3D now. And each time we went into something where we kind of got the part that we had found what we could, what we were doing, we had a breakthrough. And

that really says something about that piece of the industry. And to some extent, geologically, we have done the same thing. And now, we are out in unbelievably deep water.

TP: Turbidites . . .

RH: And the unbelievable technology that is on the producing side now . . . the industry has really been able to attract people that have been able to do that somehow or other. It's really amazing.

TP: Going back to that Texas sale in 1973, the way I understand it, bright spots were not that successful in that sale, or they got phony bright spots or what have you to explain it.

RH: You had the fizz problem. But that actually started earlier in some of the Louisiana sales. But the fizz problem was the . . .

TP: The gas water.

RH: Yes, if you get 10% gas and water, the velocity part of it, affects it as if it were 90% gas and water, so the density is different. And we made some mistakes on the fizz

too, but in that sale, Mobil got a couple of blocks that just bailed out everything. And, to some extent, that was critical to all Mobil's success through this whole period.

TP: Just getting a couple of . . .

RH: We bought a lot of blocks. We bought as many blocks as other folks because we went after . . . there were studies that said that the major reserves were in the higher priced properties and we believed that. We contributed to it by making properties high priced.

TP: I know Pennzoil bought a lot and then they ended up selling them off.

RH: Yes, they left Mobil at that sale. They went off and did their own thing, and they made a mistake.

One of the problems with that sale – it was so gassy, and people bid Louisiana prices and on the reservoir basis, gas was worth one-third to one-fifth of oil. You bid oil and you find gas, you lose.

Pennzoil in that sale got with Cities Service. As I recall, just overbid.

TP: So, they got a lot of blocks.

RH: Yes, they got a lot of blocks. Pennzoil's success became POGO's success with those two or three blocks, four blocks in South Louisiana.

TP: Eugene Island?

RH: Eugene Island 330, East Cameron 270, West Cameron 587, or whatever it was. Those were super fields.

TP: Eugene Island 330 was in the news a couple of years ago about it recharging, right?

RH: Yes.

TP: Interesting.

RH: Well, maybe it is, but it produced a hell of a lot more than engineers said it would.

TP: And so, you left for Superior in 1975?

RH: 1976.

TP: And you were with Superior how long?

RH: Five years.

TP: And mainly working offshore stuff or did you work everywhere?

RH: I worked everywhere. I was exploration VP, but I also had the minerals. I had oil, gas and minerals which was an attractive thing to majors. In late 1980, we formed Conquest Exploration Company. I was there 10 years. It was a really bad time – always in debt and always trying to raise money. We did reasonably well in Texas State waters with bright spot technology but not enough to offset the . . . we were never able to get our head above water. We had too much debt. The company was finally sold.

TP: Yes, it was like 1985 or something like that?

RH: 1990.

TP: You have given me a lot of good names. When you look back on the 1960s, at the

high levels in Mobil management, who can you talk about who was important in developing the theory of hydrocarbon indicators or pushing offshore?

RH: Well, maybe if I tell you who the players were. There is a fellow here who lives in Houston now named Ken Joynt, who was the beach master at Omaha Beach on D-Day, in the Navy with Hugh Liedtke and that was the Pennzoil contact. Ken started work offshore in Morgan City in the 1940s; he was, I guess, involved in some of the early successes like Eugene Island 128, 126. Became a vice-president in New York and then came back as regional vice-president.

TP: Is he still in good health?

RH: No, he is not in good health. He came here about the time I went to New Orleans in 1969 or maybe a little bit before. He will talk to you. I think I can get him to talk to you. I still see him and talk to him. He was the best boss I ever had because he let me do my own thing and that was nice. As a young man, he backed me, gave me good advice, tried to keep me out of trouble, but never tried to slow me down. And that was just really a nice boss. His boss, at the time in the 1970s, the executive vice-president in New York, was Henry Holland, and he backed us.

RH: Joynt was exploration?

TP: No, exploration and production.

RH: I was the exploration manager. So exploration and production.

TP: So, Joint was regional . . .

RH: Regional vice-president.

TP: And then, Henry Holland was executive?

RH: Henry Holland was executive in New York, and he backed us. In fact, the technology kind of got truncated after Mobil reorganized a worldwide thing and Alex Mashin (sp?) became the E&P guy. He was one of the 10 most difficult bosses.

Bill Tavoulareas, was the president of Mobil during the lease sales and he really got into the technology. He was a very bright guy and had. He would point out these HCIs on the seismic records, too. So, it was kind of a neat period.

They did not like being told there was not any. I mentioned the Eastern Gulf, and

they did not like that. But I can understand that. That was one of those deals that, in fact, Rawleigh Warner, who was a chairman, made a comment that Mobil could afford being wrong . . . how did he put it? He said, 'We can afford it being dry but we cannot afford it being a big field and not having a piece of it.' That is not the way he put it but . . . 'I would rather you be wrong than right,' or something. He told me that.

TP: You have to take risk to get a piece of the action.

RH: Yes. The same thing we did for Alaska. We did not have any indications or anything and we were really scared of that sale. It was almost like they did not want to hear that, although they listened to us by then and did not plunge much.

TP: Was Mobil part of the Mukluk fiasco up in Alaska? That was mostly Texaco, was not it?

RH: Yes. That was up in Prudhoe Bay?

TP: Yes.

RH: Mobil got a piece of Prudhoe Bay in the 1959 sale. Bought the oil/water contact and

then bought some blocks in the next sale, wherever it was.

TP: So, that gives us Joynt, Henry Holland.

RH: Bill Tavoulareas was the president.

TP: Is Henry Holland still alive?

RH: Yes. He lives in North Carolina and I am told he is not in very good shape. Tavourlareas is dead. I was the senior exploration land guy on all those sales up to and including Alaska. One maybe you ought to talk to is Jim Hohler though. He was staff exploration and production. He lives in Houston and he is still active in the business, and trying to still do some things.

TP: I should talk to him and see if he can talk about Mobil.

RH: You should talk to him, yes.

TP: And then, you mentioned a few Exxon guys. John Loftis.

RH: John Loftis was the director. Exxon joined the exploration and production separate.

Everybody else had exploration and production come together somewhere. Exxon basically had an exploration company and a production company. Loftis was the director on their management committee for exploration. For the Eastern Gulf sale, Bob Bibey . . .

TP: No relation to . . .

RH: Spelled it different. One is "ie" and one is "ey" - I think Bob is 'ey'. He's dead. His dad was head of the geology department at University of Texas for years and years and years. Hal Bibey. Kind of a famous name. Jim had gone on to exploration manager in New Orleans. Anyway, he worked for Loftis and he handled . . . he was the chief negotiator for the Eastern Gulf sale. Bill Holland was the exploration manager, or the manager of the division that was handling it. And Stooge Fleishman was the geophysicist. Stooge is dead. Bill Holland was at POGO when . . . I am sure he has retired. You could probably reach him.

TP: He is no relation to Scotty Holland, is he?

RH: No, he is not. There is another guy, a couple of other guys, but I do not think they were involved in the offshore at that time. Have you ever run across the name Bill Johnson? He went to work for Sohio. Jamison brought him to Sohio. Or, not

Jamison but . . . anyway, he was at Apache. He is now retired and lives in Houston. He was an Exxon operations geologist/manager kind of guy but I do not think he ever worked offshore. He and Holland were kind of parallel one onshore, one offshore.

TP: This is great.

RH: Chevron was one that moved very slow.

TP: They were the leader in the real early years in the Gulf, with the California Company.

RH: Part of it though is Chevron were a long time in putting their fluids together. They had Standard of Texas and Chevron was the New Orleans, Louisiana . . . Standard of Texas was a stronger geophysical company and although worked in offshore, was contract. They did not have their own crews or anything, and their research lab was out in California. They learned slowly. They learned finally. The exploration manager over there was named Dave Johnson.

TP: At the California Company?

RH: Yes. But there was a guy that worked for him. He was offshore manager - Bert Shulaw (sp?).

TP: I talked to Chuck Edwards. Funkhauser, we have interviewed, of course, and then Chuck Edwards was chief geophysicist. He came out of Standard of Texas.

RH: I know Chuck very well. I bet he did all of the talking!

TP: And I guess his son worked for Mobil, right? He said his son was a geophysicist with Mobil.

RH: Maybe. I know Chuck very well. In fact, we served on a church camp board together. I have known Chuck a long time.

TP: Yes, he had a lot of good things to say about Mobil.

RH: I think the Standard of Texas geophysically was way ahead of California Company, and I do not know . . . for whatever reason.

TP: There did not seem to be much transfer between the two.

RH: They would have been a whole lot better off if they would have put those two together.

TP: Yes, I guess Chuck came out of Standard of Texas and his boss was a guy named Julian Pawley who I interviewed about some of those days. But Chevron finally . . . it was not until the 1970s that they really . . .

RH: I do not know when they ever, it was after our, for . . . sale after sale after sale we tried to partner and finally just kind of gave up. They just were not there. They were still doing geology things and did not seem to ever . . . they weren't using seismic for all they could get out of it, that was pretty obvious.

TP: So, how did Mobil get so strong technically? Did a lot of it have to do with the research group under Musgrave?

RH: Some of it but Mobil started up . . . they were one of the first companies to have their own seismic crews in the mid-1930s. Gulf started out very strong in gravity applications -- torsion balance and all the salt domes in South Louisiana and Mississippi and what have you. About in the 1930s. A lot of the Gulf technology came out of Mexico and the Golden Lane things. Mobil started out with seismic crews in the mid-1930s, and I do not know how long they had their own seismic

crews but when I went to work there, they had 15, 18 seismic crews.

TP: I think Shell started with their . . .

RH: Shell . . . The only two who had offshore crews in seismic were Mobil and Shell, and Shell had their own crew for a long time.

TP: And the rest of the other companies were contract.

RH: Everybody else was contract. Until CDP and tape and some of these other things and even after that, for a long time, the contractors were interested in that acquisition because that is where they made their money. Western realized that there was big money to be made in achieving their own data and selling it. And the first programs were ones written by Mobil. I do not know whether you knew that or not. Have you talked to Howard Dingman?

TP: I have been referred to him but he, for some reason, seems sort of resistant.

RH: I will call him for you if you want me to.

TP: Yes, that would be great.

RH: Howard and I had crews together in Morgan City at the same time. He became president after Booth Strange retired. He was president of Western. Mobil was always trying to stretch their geophysical dollar because we never had enough. And Lou Kinneman, who is somebody you may want to talk to . . . I was going to have him here today but he is really in bad health.

TP: His name has been given to me.

RH: Lou . . . I went to work for Mobil offshore seismic in the 1940s. I was party chief of 13. He was my boss and he ended up replacing me as exploration manager in New Orleans and worked for me then for several years. He lives in The Woodlands.

TP: I talked to . . . what's his name at Western? The Croatian guy? He said he did not want to give me Howard's contact information but he passed on what I was doing and I never contacted him.

RH: Let me talk to Howard. Lou Kinneman and Howard Dingman put together this first spec thing offshore. Lou was exploration manager of Corpus and they were trying to stretch the geophysical dollar, and so Mobil underwrote it. Shared in the sales. In fact, Mobil shared in the sales on most of those. A lot of people in the industry

would have died if they would have known that. But after that worked so well, Mobil underwrote several of those Western spec sheets.

TP: That is interesting.

RH: In fact, after we formed Conquest, we underwrote one and ended up selling data and made money on it. Dingman is kind of essential because he was also in line with technological developments and the air gun was very important and Western just almost . . . . Bolt actually had the patents, but Western is the one that made it all work.

TP: Yes, I am told that at Western, Booth Strange and Howard Dingman were Western.

RH: Yes, I knew both of them well but I always thought that Booth was kind of the senior statesman and Howard was the guy that got his hands dirty. I would think it would be pretty important to talk to him, too. He started in the 1950s. He had a crew in Morgan City in the 1950s the first time I met him. He was party chief.

TP: So, did Mobil work more closely with Western than they did with GSI?

RH: No.

TP: I know they did the first digital.

RH: The first digital was GSI.

TP: But you used them both?

RH: Yes. Actually, probably offshore, Mobil had its best relationship with General Geophysical Company. GSI were onshore. GSI – you know the background of GSI? They formed Texas Instruments, and then they got swallowed.

TP: Swallowed by their own offspring.

RH: Well that is really what happened. They lost a lot of their better people, better brains, for better opportunities, like the Digicon thing. Where they put out that Vibroseis crew.

TP: That was Conoco, right?

RH: Well, no, the crew was . . .

TP: Well, the crew was GSI.

RH: The offshore one was . . . let me think about just how long that worked. Anyway, it ended up getting sold to Dresser and kind of pulled Dresser down and spun off and never did do anything. But I know that some of tghe GSI people went with that thing, as dgid some of the Western folks. Some of the General Geophgysical folks. We used General offshore for some reason for a long time – had a eneral crew working, and the old I.X., Independent Exploration crews offshore, and Western.

TP: Petty? Were they offshore? I cannot think of some of the others.

RH: I am not sure if Petty was ever offshore. Ray was. We had a General crew working and a crew boat caught on fire when I was party chief of Mobil's crew, and that cost us lots of problems with the Coast Guard.

TP: It is hard to keep track of the evolution of the geophysical contractors because they were merged and swallowed and disintegrated. It is a tough business to be in.

RH: Well, during the boom times, it worked pretty well for them. But the bad times . . . Mobil had a first crew they put out at the North Sea that was not doing any good at all. I was asked to go over and look at it which I did, and recommended that they

fire it and replace it with a General geophysical crew.

TP: And General was out of where?

RH: Here in Houston.

TP: Out of Houston?

RH: Yes. I do not remember what happened to them. They got gobbled up by somebody.

TP: So, is there anyone else within Mobil?

RH: Let me tell you a story. In one of the later sales, we bought a tract in Vermilion Block 21/22. It had 12 feet of water, I think. Right offshore Louisiana. And this must have been in 1973/1974. All those sales kind of run together – the later sales. It was on the flank of a big old structure that had been produced by Union and some others. Mobil also was partners with Union on a lot of this stuff in the same period. Tom Storey was the head guy in Houston, exploration guy, and he just . . . I know he told his people to just go along with whatever we wanted to do because he was a sweetheart. Anyway, there was an oil field and on the north flank of it, we had done

the flank where these bright spots were very pretty. Mobil bought it and we got a very nice discovery. We had a meeting in New Orleans about . . . went over the development schedule and all, and the fellow who was the head engineer in New Orleans for Mobil was Earl Thurmond. He had been one of the prisoners of war in Japan and Bataan death march and kind of a salty old guy . . . He was seeing how long it was going to take to develop this thing because you could not hire welders, and all the slips were full, and you could not build it in a normal slip of platform because water was too small. Ken Joynt sat there and listened and then he finally said, "God damn it, Earl. Are there any carpenters around? Go hire some carpenters. We'll do like we did in 1947." And that kind of spirit was kind of what made offshore neat during this period. You almost went from wooden boats to steel boats to big boats. Research lab had an old mine chaser, it had been a World War II mine chaser they had bought from the navy or subchaser, or a mine sweeper is what it was. They put out a pressurized air gun that you actually would use for propane. It was called a propane gun. It was attached to my crew. In fact, I had it for a while on just an experimental basis. But that was my first experience. So, that is the way it was right after the war when offshore first started, it was in wooden boats. A can-do attitude, really.

TP: Right, and it was a whole new frontier no one even knew anything about. You mentioned the water depth restrictions imposed by the production side. When did

that really just give way to . . .

RH: Each time, they went deeper. Each time, as long as I was there, it went to deep water. I think when I left, it was 600 feet. I went to New York and the folks in the North Sea were fighting the same thing. There was what became the huge gas field, the Troll, which Mobil would not touch. It was 1,100 feet of water. In fact, after I went to Superior, we got a piece of it at Superior. But it was the same kind of thought process of always being behind. I know that is why Mobil is not in deep water.

TP: Because of those earlier sales, they just said . . .

RH: Well, even now, there would be restrictions on . . . they are not represented in this deepwater thing out there now, because I know five years ago and three years ago when the sales came along, they came back into deep water. And yet, they had a piece of Hibernia, or put a discovery on Hibernia off eastern Canada. And I know other companies had that same problem. The realities of corporate life was anybody can say no. The limits of authority for saying yes are very truly gone now for what you say yes for, but anybody can say no, all the way down to almost the lowest level. And a lot of companies miss opportunities because someone had said no, too low. You have seen that in all of your histories.

TP: Well, I mean, Mobil and Shell do seem to be exceptional in that sense for this period. They trusted their technical people and allowed them . . . I remember, Pete Marshall, who was platform engineer at Shell said, "We just were not as afraid of failure then as people are now." And I do not know if it was because it was a different generation of people or there was a different kind of management culture or regulatory environment. I do not know. Or a combination of all of them.

RH: Bookout . . . Have you talked to Lloyd Otteman?

TP: Yes. He has been a big help.

RH: He is a good friend of mine. In fact, we just got back from . . . I was hunting at his place in Nebraska for a weekend.

TP: Oh, that is right. He is from Nebraska. Yes, I talked to him, and I probably should talk to him again. He had good stories about some of those lease sales in New Orleans. That seems like it was a circus now and then.

RH: Those were some of the most exciting periods. Margie . . . we got married and she was teaching in Dallas and I was working in Florida and we were moving to South

Louisiana. I worked in Dallas for a special deal to try to get data on the mouth of the river. Anyway, we got married and a lease sale was coming and I was on my honeymoon when I was told I had to go back to work. She went to Morgan City and I did not get off for six weeks working until midnight.

TP: For which sale?

RH: I think it was August of 1959. But what was so exciting, we turned the sales out. We would plan it out in great detail with a schedule. People worked an unbelievable amount of hours. The 1962 sale, the last map we did, I sat in the back of a car going from Morgan City to New Orleans contouring the map, so there are just lots of stories like that. You have heard those stories.

TP: Oh, a lot of stories about the 1962 sale and, you know, great lengths that companies went to keep their data and bids secret.

RH: There was always a lot of paranoia. I have a story. In one of the sales we were bidding with Gulf . . . the Gulf Funkhauser was the exploration man in New Orleans, and his boss was Petrie. I will bet you have heard the story. Somebody stole, in Funkhauser's mother's house, stole the safe and all of his bidding notes and everything were in the safe.

TP: For what sale? 1964?

RH: No, this was 1970 or 1972.

TP: So, someone who knew what they were working on . . .

RH: No, I do not think it was that, I think it was somebody stole the safe and his notes were in there. But this was a week or so before the sale. Ken Joynt had a real bad decision to make whether to tell up the line in Mobil. And he decided not to tell it, which was the right decision, because it would have caused panic that you would not believe.

TP: To tell the superiors, to tell the bosses in Mobil that it happened?

RH: Yes, that Gulf/Funkhauser had lost the . . .

TP: Mobil was partnering?

RH: We were partners.

TP: There probably had to be some paranoia about once you put the final dollar amount on the bid, you tried to make sure as few people as possible had knowledge of what that number was.

RH: The 1959 Prudhoe Bay sale . . . Alex Masset was the vice-president. 1969, Prudhoe Bay. There had been some tracks sold earlier but across the structure. These were the flank tracks. And these were being drilled. And Mobil had two or three wells that went down. And Masset did not trust any of his people so he hired Burns Detective Agency to sit the well, bring the logs back and forth. Tenneco called. The Tenneco security people called the Mobil security people and said they got a contact from one of the Burns guards who had a copy of the log that he wanted to sell. And, of course, it was against the law to trade in that data. It was set up to meet the guy at the airport in Seattle and a sting operation and arrest, what have you. No danger done because Tenneco reported it but here was an example of did you trust your guards. They turned out to be bigger crooks than your own people could possibly be! That was the intellect of senior management.

TP: Well, can you think of other stories that might be useful for this history?

RH: Oh, there are lots of stories, a billion stories, but no.

TP: I forgot to ask you about Mobil Bay. Were you part of that?

RH: Yes, in fact, I signed the AFE. The first AFE I signed when I went to New Orleans as exploration manager was the lease sale at Mobil Bay.

TP: AFE?

RH: To buy acreage at the state lease sale in 1969. We bought the lease, shot it, did depth of structure. Recommended putting it into budget just real quick. And it was approved for, I think, I guess 20 years to get approval to drill it.

A story I maybe should not tell but I will. We had a meeting with George Wallace who was then governor of Alabama, to try to get the permit moving to drill the damned well. The Mobil lobbyist was there with a paper bag and gave it to a guy outside of Wallace's office. And Wallace asked, whatever the guys name was, "Did you bring something?" The lobbyist says, "Yes." He says, "Well, that is enough to keep me from giving it to Shell." The largest gasoline distributor in Alabama was a Shell dealer and apparently was very well-connected politically. But apparently, Shell E&P . . . another fellow with Shell at that time, had talked to me about partnering, they wanted a piece of the well. What is his name? Anyway, apparently, they had gone through their distributor, and I found out later it was $100,000, which

shocked me. I was young and naive. But it took a long, long time to get that well drilled.

TP: And it turned out to be a big gas . . .

RH: It turned out to be a big gas . . .

TP: Robey Clark had a story of one the guys . . . one of the division geologists or division explorationists who would walk out on the point there and could smell gas coming out of the water well.

RH: That is the point at Fort Morgan which is on the East side, and that water well was leaking gas. It turned out to not be connected to the reservoir, but that well was leaking gas. The geophysicists who really pushed that was named Jack Wilson. I do not know whether you have heard his name or not.

TP: Yes, I think that is who it was.

RH: He pushed it.

TP: Great. Well, I do not want to take up too much of your time but this has been very

useful. I can always come back and ask questions.

RH: I get to Houston usually once a week maybe. Not every week but whenever we are in this part of the country. We have a house in New Mexico, too. A summer place.

TP: Well, I thank you for your time.

THE END