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# A Conversation With ...

## Roice Nelson

By Satinder Chopra, Editor, CSEG Newsletter and Penny Colton

**“Think outside the box? ...He doesn’t even know there is a box!”**



The Geophysical Society of Canada (CSEG) has graciously allowed us to re-publish a portion of the interview with Roice Nelson, which originally appeared in the Recorder. The interviewers were Satinder Chopra and Penny Colton.

Roice Nelson is an experienced explorer who has been successful in both entrepreneurial and technical roles in the oil and gas industry. Roice was honoured by the SEG with the Cecil Green Enterprise Award in 1999. Roice is best known as the initial founder of Landmark Graphics Corporation, where his insight led to the company providing interactive seismic interpretation tools especially for interpreting 3D seismic data. Before that he was a Senior Research Scientist at University of Houston's Seismic Acoustic Laboratory (SAL). Under his dynamic leadership four new labs were created from SAL that resulted in increased sponsorships and growth in personnel. He is a well-published author who has presented at Conventions and

Workshops. His name is also familiar through his book entitled 'New Technologies in Exploration Geophysics' published by Gulf Publishing Company in 1983. This book was well ahead of the times then and forecast the impact that interactive interpretation technologies would have in our industry.

After leaving Landmark Graphics in 1992, Roice started several new companies, including Dynamic Resources Corporation (DRC), Continuum Resources International Corporation, HyperMedia Corporation, and Walden 3-D, Inc. (W3D). Presently, Roice is residing at DRC and W3D in Houston. His rich experience in seismic data acquisition, processing, and interpretation includes acquisition projects not only in the U.S., but also offshore Nigeria and The Cameroons. Interpretation projects span different parts of the world.

**Satinder:** *Roice, let's begin by asking you about your educational qualifications and your work experience. Briefly, can you summarize these for us?*

**Roice:** I graduated from Cedar City High School and went to the University of Utah because I had a scholarship there and didn't have a scholarship to the hometown College, which is now Southern Utah University. I went to the "U" for two years, then took two years off to serve a mission for the LDS Church in Britain, and came back and graduated with a BS in Geophysics in July of '74.

After graduating I went to work for Mobil Oil in Dallas. I went to a night MBA program and got an MBA from Southern Methodist University with an emphasis in entrepreneurship. This degree was actually completed after I went to work for Fred Hilterman at University of Houston. I took the last two courses at the U of H and received the MBA from SMU in 1981.

**Satinder:** *What about your work experience?*

**Roice:** Bob Otis -- my "Big Brother" in the fraternity I joined at the "U" -- talked me into going over to the

Geophysics Department where he was studying. I ended up getting the Pan American Scholarship and working at Pan American the summer after my second year of college, and then again the summer after my third year and after my mission. So I worked in Denver the summers of 1970 and 1973. It was Amoco the second summer.

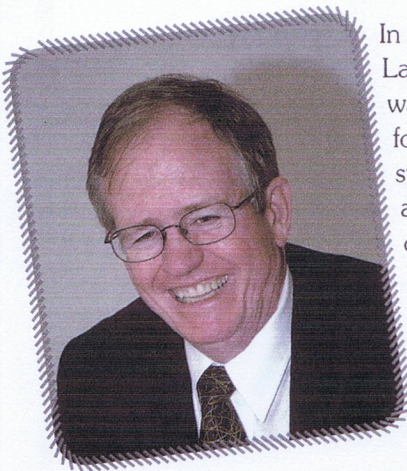
I always intended to do graduate work, but the embargo happened, and oil companies were offering more money than the professors were making. There was a bidding war, and I ended up going to work for Mobil Oil. I worked at Mobil from July 1974 until January 1980 and was recruited to the University of Houston by Fred Hilterman, who had also been at Mobil.

Fred founded and was running the Seismic Acoustics Lab (SAL) and hired me as an associate research scientist there. During the three years there we founded the Allied Geophysical Labs (AGL), and I became the general manager of the integrated seismic acquisition, physical modeling, numerical modeling, image processing, computational research, and well log testing laboratories. We put together

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books summarizing research for each lab's sponsors and built numerous calibration, structural, and stratigraphic physical models. In earning the MBA I learned the best place to really learn about new opportunities was at the interface between university research and industry. The AGL, SAL, and related laboratories provided the perfect forum to test my ideas for an interactive 3-D seismic interpretation system.



In the fall of 1982 we started Landmark Graphics, and I was full-time with Landmark for about 10 years. Then we started five other companies at the same time. None of them were financially successful, even though they were each built on solid technical concepts.

One of the companies we had started earlier was Dynamic Oil and Gas Corp. I worked very hard to put together an oil company. It was under-capitalized, and I ended up going to work for Geophysical Development Corporation. GDC was owned by Geokinetics, and GDC became the processing and interpretation division of Geokinetics after the purchase of Trace Energy and Grant Geophysical.

**Satinder: So how did you get interested in geophysics first of all?**

**Roice:** Interest in geology comes along with growing up in Cedar City in Southern Utah. I spent a lot of time on a horse. We had cattle, and I love the outcrops and the geology. There are iron mines out in the valley and coal mines up Cedar mountain, and in my youth we visited both sites many times. I was interested in geology, and this interest fit with what Bob Otis told me about geophysics. I originally signed up to be a math major with the University of Utah. Geophysics was closer to my interests, so I have been involved with geophysics since my first visit to the Geophysical Department at the "U."

It was interesting -- when I came back from my mission in the fall of 1972, my professors said, "You know, Roice, there are no jobs, no scholarship money, and you turned down the last two years of the Pan American Scholarship to go on your mission. You really ought to go into some other profession. You went on a mission and obviously are not a geologist." I thought it was funny. I had really enjoyed my summer with Pan American, so I stuck with geophysics. Of course, the oil embargo happened, and less than a year later the oil companies came in and were offering all this money just because a few of us had a little bit of experience.

**Satinder: Tell us about how and where you got the idea of 3-D seismic interpretation on workstations, which was a dream that you later realized with Landmark Graphics.**

**Roice:** When I was working for Pan American in Denver the first summer, it just seemed like there was a better way to do seismic interpretation. The interpreter, Alex Benton, had me posting picks – he would call up the numbers and I would post the pick on a map – and then he would contour the picks. When being shown how to contour, I said, "You know this is three-dimensional. You should be able to look at these surfaces in three dimensions."

Dr. Ralph Shuey was my advisor before my mission. Dr. Bob Smith was my advisor after I returned. Dr. Shuey had gone to Gulf Research, and Bob Smith was working with data from Yellowstone Lake. Dr. Smith and his graduate students had collected some sparker reflection seismic data across the lake. Because I'd worked for Amoco, he gave me the data and asked me to interpret it. So I did. I made a map of the base of the Quaternary Sediments in Yellowstone Lake. When I showed the map to Bob Otis, he said this will contour nice in 3-D. He was doing some secret research for the government in 3-D computer graphics. In those days the University of Utah was very involved in creating the computer graphics revolution. The system they were using was developed by Ivan Sutherland and Dave Evans and was called the Line Drawing System-One, or LDS-1. This system led to the formation of Evans & Sutherland, the leaders in flight simulators, planetarium presentations, and related high-end 3-D vector graphics applications. Bob took my map, digitized it, and made several three-dimensional projections of the map. It was obvious to me that this needed to be the way geoscientists look at three-dimensional subsurface data.

Before leaving the University of Utah I had drawn different pictures on several pieces of paper, describing an interactive 3-D seismic interpretation workstation. I didn't know anything about 3-D seismic. These initial drawings were simply 3-D visualization concepts. When I reported to work for Mobil, the first day they gave me these papers to sign, including patent release forms, which I refused to sign. I told them the ideas I have are too valuable to just give to Mobil. I was not willing to sign papers giving Mobil ownership of everything I had ever



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done or would do. They talked to me and talked to me and had me go meet with various people around the company. Finally I was ushered in to meet the Manager of ESC (Exploration Services Center), Bob Peacock. He said, "Roice, develop your ideas here. Try to get them developed internally, and if Mobil won't develop them, just go someplace else and do it."

I had grown up on a farm working for my Dad in the family meat packing plant, which had been shut down by the government. So this idea of changing jobs was a whole new concept to me. I thought when you went to work for a big company you were there for your whole life. So I said, "Are you sure it's okay if I leave and develop the ideas someplace else?" Bob said, "Yes, people do it all the time." And so that's what we ended up doing. As a sideline, Bob Peacock was the manager of Mobil Norway when they became one of Landmark's biggest customers early on.

**Satinder:** *You have talked about how one thing led to another and you ended up at Landmark Graphics; can you also tell us about the business aspects, how Landmark was financed, or other developments that took place?*

**Roice:** When I went to work for Fred at the University of Houston I said, "Fred, we have too many kids to work here very long." We had four children at the time, and three years later we had six. So I told Fred I would work at SAL for two or three years, and then I was going to go and make an interactive 3-D interpretation workstation. This is even though the University of Houston actually paid me very well for a staff geophysicist. I was told I was actually making more than the chairman in the Department of Engineering, which seemed unfair since I almost had an MBA and he had a Ph.D.

When I was introduced to the Seis Lab, at the first "3-D Seismic Techniques" course taught in Houston, I knew I needed to be at SAL. Wayne Wade, the E&S, salesman gave me the encouragement to sit at the lunch table with Fred and start the conversation. My goal, which was successful, was to use SAL as a test bed to prototype and do a proof-of-concept of interactive 3-D seismic interpretation workstations. Over three years we formed the Image Processing Lab (IPL), the Keck Research Computational Lab (RCL), the Field Research Lab (FRL); the SAL and Well Logging Lab (WLL) were already formed. So we had five research labs under the AGL. All of these labs were tied to my interest in visualization and integration of subsurface data. This was an ideal environment within which to do a proof-of-concept of ideas I have always felt were planted in my head. Ideas which became Landmark Graphics, SMT (Tom Smith, the founder of Seismic Micro-Technology, was a Ph.D. student at SAL), and influenced development of all of the other commercial workstations that have been developed.

I took the very first notes made at the University of Utah and published them shortly after getting to SAL in a paper titled "Introduction to Interactive 3-D Interpretation." Six months later it was published in the Oil & Gas Journal. This paper outlines Landmark Graphics. So awhile after this publication I got a phone call out of the blue from Kevin Kinsella. He was a venture capital broker. He didn't like the term.

Kevin had helped start a couple of companies in San Diego. One was a company called SpectraGraphics, which built high-resolution computer graphics systems for IBM computers. The graphics processors allowed high-speed visualization. Kevin was talking to some people in Denver, and he saw some seismic sections. He mentioned these data should be displayed on computer screens. The people he was talking to said there was an article in the Oil & Gas Journal about this topic by a very famous geophysicist named Fred Hilterman and another researcher named G.H.F. Gardner. I was very insecure and so had put the names of the SAL principal investigators on the paper I had written. Kevin contacted Fred, who had left the Seis Lab to co-found Geophysical Development Corp.



Let me back up a little bit. At the Seis Lab, I would take sponsors out to lunch regularly. We had grown the sponsorship from 26 to about 42 sponsors. I had made good friends among the sponsors. One day Reg Neil took me out to lunch and said, "You know, Roice, maybe you ought to leave the Seis Lab and go into industry." I told him the time was not right and I needed another six to 12 months. Then shortly later John Sherwood took me to lunch, and the same conversation was repeated. The next thing I know, Fred tells me he is leaving the University of Houston to start a new company with Reg Neil and John Sherwood. These are the three folks Kevin Kinsella was talking to at GDC.

Because the discussions were not progressing as fast as he wanted, Kevin put an ad in the Houston Post, which doesn't exist anymore. The ad was for somebody with an MBA who was interested in visualization and who understood geophysics to manage his new company. Kevin had not told the GDC people about this ad. He showed the ad to Reg, and Reg asked if he had been talking to Roice Nelson. Kevin said, "No. Who is that?" Reg told him a little bit about me. Then he showed the ad to John Sherwood, and John asked if he had been talking to Roice Nelson. Finally he showed the ad to Fred, and I recall being told that Fred thought Kevin had set him up to bring me into the picture.

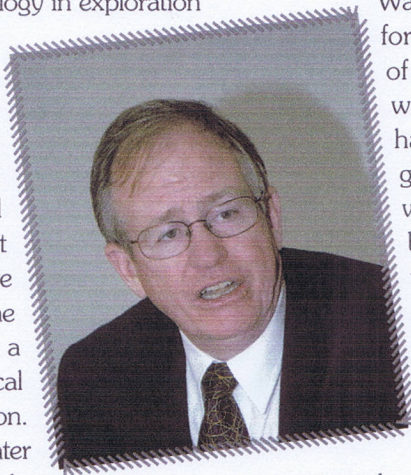
So Kevin phones me out of the blue and says he has this idea he wants to discuss. After asking what it was all about, we agreed to meet at The Inn on the Park the evening of Dec. 26th, 1981. I remember the day partly because it was the day



after Christmas, Boxing Day. So we met and talked for a couple of hours. Kevin's ideas were very close to mine, and this started the business plan conversation.

Kevin attempted to recruit an expert in Harris Computers to be the computer specialist. He was looking for a software guy.

Kevin and I approached many people. People turned us down for different reasons. We probably spent four months doing this in our spare time, and we had a fairly decent business plan put together in the spring of 1981. However, everybody had turned us down. So we weren't ready to take the business plan to investors. Kevin flew into Houston from San Diego, and we had lunch. He mentioned we need a really good marketing guy. I told him the best in the industry was Bob Limbaugh, who has been beating everyone else up selling the Digicon Disco System. Kevin suggested I approach Bob. It turned out I already had an appointment with Bob to interview him for an article I was writing on new technology in exploration geophysics for World Oil. The topic was about the future of databases. When we finished the interview, I asked if the two of us could talk for a few minutes alone. I asked Bob, "How would you like to quit your job, take a cut in pay, and be my boss?" He replied, "Absolutely!" I told him about Kevin and about my efforts to recruit a hardware and software guy. Bob agreed we needed the best in the industry. He told me there were former Exxon Ph.D.s who had a consulting company called Cyberan Geophysical named Andy Hildebrand and John Mouton. So Bob asked them if they were interested later that day. They said, "Absolutely!" That's how the five founding shareholders of Landmark got together. Four of us (Limbaugh, Hildebrand, Mouton, and Nelson) had 100,000 shares each, and Kevin Kinsella had 25,000 shares.



**Satinder:** *Great. Would you like to share with us some of the hardships that you faced with this plan that you had drawn up and contacting the right people and all that?*

**Roice:** Well, it was hard to get the money. It is always hard to raise investment money

But our companies, Control Data Capital Corp., D.L.J. Sprout, Bayless-Sevin-Rosen, and Novatec became the four initial investors in Landmark Graphics.

We had a lot of start-up problems. Jon Bayless brought in Gene Ennis from Texas Instruments, who cleaned up the inventory problems, fired some people, and did things that tore me apart inside. Gene pulled us out of the hole and made it so we actually could deliver those first Landmark workstations.

**Satinder:** *The success of Landmark Graphics and its public offering must have made you a rich man?*

**Roice:** Yes, I made a whole bunch of money, at least a whole bunch to a farm boy from Southern Utah. I turned around and reinvested it in my ideas.

I started Dynamic Oil and Gas Corp. with Roger Anderson at Columbia University and Larry Cathles at Cornell. We had started the Global Basin Research Network (GBRN), and we had done very interesting geotechnical work proving some oil and some gas fields dynamically replenish. Dynamic Oil and Gas Corp. was going to take advantage of and commercialize these concepts.

The central hub of my other investments was Walden 3-D, Inc. which was to be the general contractor to implement my dream of building a new kind of city. Walden 3-D was named after Henry Thoreau's "Walden Pond" and B.F. Skinner's "Walden 2." In my mind Landmark Graphics was originally to be the economic and demographic basis of a new type city. Walden 3-D was going to be the general contractor for prototyping a city built around people instead of around cars. As I look back, I see this dream was only in my mind and, of course, it has not yet happened. I feel this is largely because the financial guys got in the middle of what we were doing and we had to meet quarterly projections instead of building the foundation for an entirely different type of company. And to be fair, when financial guys have not been in the middle of my projects, they have floundered.

The company investment which generated and lost the most cash was HyperMedia Corp. As mentioned earlier, Landmark paid what is now the University of Louisiana at Lafayette to build a hypertext engine in 1988. This was originally to provide help support to Landmark users. HyperMedia Corp. (originally Hypermedia eXchange Corp.) set out to commercialize this product. Besides hiring the wrong person to manage the operation, I guaranteed loans to run HyperMedia Corp. with Landmark stock. Landmark stock went from \$26 per share to \$8 per share, and although I thought I was well collateralized, it was not by a factor of 3. The bank called the note, and I have never financially recovered. So that is why I say we made some money, and we spent it all.

**Satinder:** *Any regrets on doing that?*

**Roice:** Oh, it caused problems. You know, there are always regrets when negative things happen, forcing life's flow to go a different way than you want it to go. It would have been a lot better to invest in more conservative things than some of my ideas. Although we were technically right on track with each of the new companies, they were financial failures.

**Satinder:** *What strategies had you employed to pursue the career options that you actually pursued? I know you had*



**some ideas, you started working on them, and then wherever you went, you had the same focus in mind all the time?**

**Roice:** I did. And this is something which doesn't get talked about much. When I first arrived in England for my mission, the leaders introduced us to tracting, or knocking on doors, to find those interested in our message. The very first day in London we were taken to White City to experience this process. White City is a large concrete council housing project, and as I went from door to door and I looked at those poor people in that cement jungle, I told my companion how my dad's cattle lived in better conditions than these people do. I decided this way of housing people needs to change. And striving to influence this change became my focus.

My best friend, Ray Gardner, the drummer in our high school band, was getting his architecture degree. I wrote to him about the experience. He wrote back and sent some articles about Paleo Solari, one of Frank Lloyd Wright's students, who is building the new city named Arcosanti at Cordes Junction, 60 miles north of Phoenix, Ariz. I became fascinated with the concept of arcologies and building cities around people instead of around cars. This became the theme of my projects. Walden 3-D was to be the general contractor prototyping a new type of city. Landmark Graphics provided a way to accurately define the foundation of the city and was intended to generate enough money to build this city and find employees to populate it. HyperMedia Corp. was to provide an information infrastructure for the new city. Dynamic Oil and Gas Corp., now Dynamic Resources Corp. (DRC), was to provide energy for the new city. China Cattle Corp. was to provide food for the new city. Continuum Resources Corp. was to provide a way to design the city in virtual reality. Each project is related to moving along the major goal. We have collected a lot of information and technology over the last 37 years, and we have yet to build any kind of a new city, except in inexpensive virtual reality.



**Satinder:** *I suggest remaining optimistic.*

**Roice:** I do remain optimistic that cities can be built more three-dimensionally, taking advantage of putting the people together on 5% of the property and leaving the rest of the property as nature so inhabitants can keep in touch with natural cycles. Mass transit will connect similar kinds of communities. Everything in these communities will be within walking distance. The name Walden 3-D is meant to reflect these concepts.

**Penny:** *You may well be there one day.*

**Roice:** We'll be forced to. Remember in 1979 when there were all of the lines at gasoline stations? At the time, I was helping run four land company seismic crews for Mobil Oil. Attempting to get oil and gas for the crews through the US Government quota

system was hard. The government officials would not provide a quota if there was not proof of similar expenditures in the area the year before. So here we are, working to find oil and gas, and we couldn't get oil and gas to run our crews. At the same time I'm pursuing these ideas about trying to minimize the use of oil and gas for automobiles, so we can use it for medicines and fertilizers and make-up and synthetics and paints and other options which have more long-term relevance than burning it up for transportation because we have built our infrastructure around the concept of inexpensive gasoline and because the impact of Peak Oil has yet to be widely recognized.

**Satinder:** *Roice, let me ask you this. What personal quality or qualities did you draw on when you led all these efforts, including Landmark?*

**Roice:** The ones that are important to me are hard work, which I learned from my dad; honesty, which came from my dad and my mom; and studying problems out. My mom was a university professor and administrator. I think just telling the truth and working hard and believing things are going to turn out OK is what is important. I don't think a lot of people think these things are important today. I feel like I am getting to be an old man when I see some of the baloney that goes on, and especially some of the dishonest and unscrupulous things people do.

**Satinder:** *The other one that you mentioned before is dreaming big?*

**Roice:** Well, I have never known how not to. One of my friends once said, "Roice doesn't think outside the box; he doesn't even know there is a box."

**Satinder:** *What personal and professional vision are you working towards?*

**Roice:** I have several things that I am working on. I have a book which I talked to you a little bit about and which I'm seeking feedback on – it's called "An Open Mind" (<http://www.walden3d.com/openmind>). I have spent most of the last decade developing some new ideas for exploration, which I think are very valuable. Through a NetWork of professionals, we are collecting exploration technologies, concepts, leads, and prospects, which friends and contacts were never able to get developed nor drilled before retiring or being fired, and repackaging them as TMIs (Technology-of-Mutual Interest) and AMIs (Area-of-Mutual-Interest), ranking them, and selling them for a fee and participation (see <http://dynamic.walden3d.com>). One of the most exciting technologies is an on-shore EM approach, which we filed a patent on in January 2010, have obtained an exclusive license for ten plus years of historical data, and have completed the first proof-of-concept project with a major oil company. In fact, I think the whole NetWork approach is revolutionary. The potential is to make bigger changes to society than came from Landmark.