

“What do you know about Poisson’s Ratio?”

This issue features memoirs of Easton Wren, a well-known name in Canada and internationally recognized as a believer in the application of new seismic techniques. Easton is a former President of CSEG (1981). The past editor of the *Journal of CSEG* and received CSEG’s Best Paper award (1974), Meritorious Services award (1977) and Honorary Membership (1988). He was the 1987 AAPG Distinguished Lecturer and is still very active in the development and presentation of training courses in the exploration industry.



Easton Wren

The invitation from Satinder Chopra to write my “memoirs” for the “Recorder” was a pleasant surprise. However, the assignment raised questions as to what to include and how best to structure the article to provide some insight and potential benefit for younger readers. Suffice to say that there is much here that is pure serendipity and without the influence and guidance of mentors along the way it might have turned out to be a very different story.



Figure 1. One year old.

Early Days

I was born in Scotland just before World War 2. In my toddler years (Figure 1) I was unaware of Poisson’s Ratio and attached no significance to it.

Before I really knew him, my dad was off in the army and spent many years in Europe (Figure 2).

My mother had been a schoolteacher but had been forced into early retirement when she contracted rheumatic fever and the educational system would not allow her to continue for fear of heart problems. This had a significant benefit, which I did not fully appreciate at the time, in that I had an additional teacher at home.

In post war Europe the young ones were handed the torch for the future to bring prosperity back to ravaged economies and our education became the supreme priority. What irony in that many of my generation emigrated away from Europe and the UK as soon as we were educated. The industrial psychologists put it down to subliminal fear for another World War.

My elementary, junior and senior high school education was memorable although I did other things along the way (Figure 3). I was fortunate to have the benefit of an excellent system with superb teachers. Mathematics, chemistry, physics, history, geography, English, Latin and French were traditional subjects and I really enjoyed being at school. I recall a physics teacher talking about Poisson’s Ratio but it did not make any impression.

University

My parents, and the system, expected that I would go on to higher education so I entered Glasgow University and enrolled in the standard fare for



Figure 2. 1940, mum, dad and my sister Patricia and I.



Figure 3. 1947, cub scout.

the first year...Chemistry, Mathematics, Physics and, fortunately, Geology. At that time I had serious interests in organic chemistry but the lab work was suffocating and the outdoor life of field mapping in geology was much more attractive, even in the rain.

The geology department at Glasgow University was a very traditional hard rock school with a substantial component in paleontology. The head of the department was Professor T. Neville George, a remarkable man with great teaching

skills. He would not tolerate students taking notes in his lectures and in hindsight I remembered his material very well without the benefit of notes. He was also a television personality with a weekly series dedicated to geology. His command of English and his delivery both on TV and in the lecture theatre, were impeccable.

For the record another contemporary television show at this time was “This Wonderful World”, a kind of early days “The Nature of Things”. The presenter was Dr. John Grierson who had already established a level of fame in Canada as the founder of the National Film Board in the 1930’s on the premise that during the Depression the public could be entertained and educated at the same time through a unique type of movie which he invented and called the “documentary”. Grierson ran foul of anti-communist sentiments in the post World War 2 years and returned to Scotland. He then engaged in documentary production.

The Geology Department had just engaged a young geophysicist (Adam McLean) from Shell. A former Glasgow graduate he had returned to the University to pay his dues. He was the first geophysicist I had ever met. Anxious to establish himself in a predominantly geology department, he made a good impression on the undergraduate students and I took a particular liking for him and his geophysics courses. Of my contemporaries I was probably the most impressed with his material and he took a particular interest in me for that reason. One day he asked me casually “What do you know about Poisson’s Ratio? A

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few vague memories flashed through my brain. “Nothing” I replied. “Surely you have studied Poisson’s Ratio at high school or in physics at this university?” “Yes” I replied “but I have only a vague understanding of what it is and could never muster much enthusiasm for it”. “Do yourself a favour” he said “check it out”. I confess I never did.

Libya and East Africa

In 1961, I graduated with a degree in geology and tried to find a job with one of the large oil companies in London. No luck. By chance I ran into an old friend in a London pub. He was working for Robert H. Ray, an American seismic contractor in Libya. The company had a London office and he introduced me to the area manager and that afternoon I had a contract for employment in Libya (Figure 4) working initially as a surveyor (Figure 5) on a seismic crew. I spent two great years in the western Sahara on crews working for Philips Petroleum and did everything from surveying, junior observer (Figure 6), interpreter and assistant party chief (Figure 7). This introduction to field work gave me the basics and I have never lost my interest in acquisition design. I would have stayed longer but a crusty old Texas shothole driller told me to get out of the desert while I could otherwise I might get to like it too much to ever leave. This is the “mad dogs and Englishmen (Scotsmen) sit out in the noon-day sun” syndrome and like Lawrence of Arabia it is very easy to be charmed by the desert (Figure 8).

By this time I was married (to Frances) and had a young daughter (Jacquelyn) and I was offered a position with the Overseas British Geological Survey in Uganda (Figure 9) doing geological field mapping and some ground magnetics and resistivity. This sounded promising and we spent two years in East Africa where my son Eric was born. In Uganda we worked with a group of Canadian geologists seconded from the Geological Survey of Canada. We became good friends and their enthusiasm for Canada had a lot to do with our decision to emigrate one day.



Figure 4. 1960, arriving in the Libyan Sahara Libya.

Post Graduate

Frances, my wife, had been in medical school at Glasgow where we met and had given up her studies for the Uganda trip. We decided to return to Glasgow where she could finish her medicine degree and I would do a Masters in geophysics with Dr. Adam McLean.



Figure 5. 1961, surveyor, Libya.

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Figure 6. 1961, JO on crew, Libya.

We also had easy access to grandparents who were willing to baby-sit. The Scottish system for post graduate work is different from North America. Initially I enrolled in the one-year Masters programme but after two months I was offered a switch to a PhD. The downside was that if I did not complete satisfactorily I could not carry it indefinitely. So there was a great opportunity to finish a PhD in 3 years or less but failure would mean nothing in terms of a degree. In other words, there were no guarantees.

I opted for the 3-year PhD. My thesis supervisor, Adam McLean, was thrilled since I was only his second post-graduate student. We had an excellent relationship and he became the first of my mentors. One day he caught me cold when he asked “what do you know about Poisson’s Ratio?” My reply was much the same as the previous time “nothing much”. He responded again by saying “do yourself a favour and check it out”. I never did.



Figure 7. 1962, assistant Party Chief, Libya.

During the summer of 1968 I was nearing completion of the thesis and I had job interviews with Chevron for the Research Lab in La Habra and with Shell for the Research Centre in Holland. I had had enough of research and wanted to get into seismic operations and interpretation so when Pan

American Petroleum Corporation offered me a job in Calgary I was delighted to accept.

In October of 1968 Dr Adam McLean arranged a farewell party for us and as he shook my hand and wished me well he said “you did it again. You ignored Poisson’s Ratio. Do yourself a favour and check it out.”

Soon after, the family, Frances MD, Jacquelyn, Eric and Zoe (another daughter born in Scotland) and I landed in Calgary.

Amoco Canada

This transition into a big oil company turned out to be the most satisfying of my career. In 1969 Pan American became Amoco Canada and we were taught how to say it properly with the emphasis on the “A” and not on the other two syllables.



Figure 8. 1962, Libya.



Figure 10. 1969, Amoco, Lake Erie.

Amoco was an excellent company with a huge talent pool (over 100 geologists and geophysicists), superb management and great resources. I found many coaches who would willingly help me with the practical side of things. The system moved one along if you showed any aptitude. I worked in southern Alberta, NWT, Lake Erie (Figure 10) and the Grand Banks in the first few years. In each of these districts we geophysicists were totally immersed in the overall exercise of acquisition, processing and interpretation. I recall that the geophysicists played rather subservient roles to geologists who seemed to be the favoured ones ... how times have changed!



Figure 9. 1963, Uganda.

Human Resources organized many short courses including Defensive Driving and Public Speaking. This is where I discovered that I really liked to speak to large groups of people.

In 1971, I made my first visit to Amoco’s Research Centre in Tulsa, Oklahoma. I went with another mentor of mine, Jack Cameron, and was introduced to a galaxy of geophysicists including Sven Treitel, Norman Domenico, Enders Robinson, Dan Silverman, Moe Widess and Larry Wood.

Many geophysical milestones happened during my time at Amoco. In 1973 we became aware of “Bright Spots” with the presentation from Ray Sengbush and Norris Harris who left Mobil and created Pexcon to introduce the world to the new amplitude techniques. In Alberta we drilled a few coals wells since we did not appreciate the significance of the unconsolidated nature of the gas sand to produce the desired amplitude response. Larry Wood was instrumental in developing “Wavelet Processing” mixed phase deconvolution and experimented with Turhan Tahner’s “Simplan”. We had a good wavelet extractor and frequency deconvolution techniques and in Bill French we also had a migration guru.

At Amoco we listened when Sven Treitel spoke. He decided that we should be Ormsby wavelet advocates since the Ormsby was “more realistic” than the Ricker. At an SEG convention I rode on a shuttle bus to the Ice Breaker beside an elderly gentleman who saw my name tag and asked me if I knew Sven Treitel. When I said yes he then asked me what we were doing with wavelets. I replied that we were Ormsby advocates since “the Ricker wavelet was too simple” He listened patiently as I explained the benefits of the Ormsby and when we got off the bus and strolled into the convention together he asked me if he could buy me a drink. It was only when he offered me the glass that I saw his nametag with “Professor Norman Ricker, University of Oklahoma” in bold print. Be careful who you talk to on convention shuttle buses!!

I recall going on recruiting trips to Queens’ and the University of Toronto and hiring a very talented young lady from Queens’, Janet Barker, for Amoco. Malcolm Knock, the chief geophysicist, told me that I would be responsible for her introduction to a seismic crew. On a field trip to a CGG crew in Red Earth I introduced her to the rigors of a seismic field operation. The production for that crew hit a new high and the table manners went way beyond expectation!

At Amoco I became an addicted lunchtime runner out of the Downtown “Y” and started racing. The key runner in

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Figure 11. 1975, Amoco “Ammonia”, Corporate Cup Relay 2nd: with Peter Jordan, Adrian Johnson, Ian Gordon.

Amoco’s relay squad was Ian Gordon, just hired as a geophysicist but with the great distinction of being a Canadian Olympian (Figure 11).

My career with Amoco was most satisfying and I felt I would never have any reason to leave until I was offered a transfer (and promotion) to New Orleans in 1976. While I had visited the city and liked the French Quarter I had no desire to live there and with a family of four children (Kathryn as the latest arrival) decided to leave the company as opposed to sitting in the “penalty box” for refusing a corporate

move. In June of 1976 I accepted an offer from Pete Savage to become the Chief Geophysicist at PanCanadian (Figure 12). I spent two years there and never quite got over the trauma of leaving Amoco. I was privileged to meet a whole raft of people who became close friends, including Don Crane, Jim Thomson, Lionel Cane, John Carruthers and Abby Badwi.

Petrel Consultants

In December of 1978 Wes Rabey bought me lunch and asked if I would consider starting up a consulting company which would supply integrated geology and geophysical services to the industry and go international. It took me about two minutes to accept and in January 1979 I launched Petrel Consultants with Don Crane and my old friend Neil Hutton as partners. We had a slow start but after about 4 months we got into gear and hired a group of bright young professionals, including Derek Gillespie, Bill Clack, Frank Chappel, John Varsek, Graham Millington and Paul Viney as well as Ray Lipkewich as manager of our processing centre.

Through the late seventies and into the early eighties we built a reputation on “geology first” with seismic in support. We conducted integrated field studies and opened a Denver office. We were seriously affected by the NEP but managed to get through it. In 1984 I listed to Bill Ostrander’s seminal paper on AVO (Dr Adam McLean’s advice came storming through...I could have been the father of AVO if I had paid attention to Dr. McLean who had been an associate of Otto Koefoed at Shell) and with help from Mike Graul prepared a paper on the principles and gave it to a CSEG luncheon. This caused a stir and I did receive some “hate mail” with comments like “you are destroying the fabric of seismic if you advocate pre-stack procedures!!” Many years later I sat at the SEG convention in Calgary with Jim Hume in a packed AVO session and he said “look at what you started”.

At Petrel we carried the torch for AVO and John Varsek became the authority. Our most notable successes were in a series of wells drilled in the Cardium play in Carrot Creek.

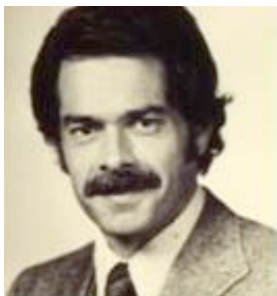


Figure 12. 1977, Chief Geophysicist PanCanadian.

Early in my Petrel days I was asked to consider being a candidate for the SEG Executive. While this was very appealing, the company was running for daylight with very limited financial resources and I had to decline.

While at Petrel I became reconnected with Frank Dabbs. I had met him when he was a junior reporter for “Oilweek” looking for a “quick fix” in geophysics. We got together on a TV programme for CFAC called “Four Tonight” with Tag Watson and Sheila O’Brien. This was my baptism into television and I found it engrossing. After one year of production the group broke up and Frank did his own thing with a weekly political programme. I had always wanted to produce something and created “Science Spectrum” a weekly show dealing with scientific topics.

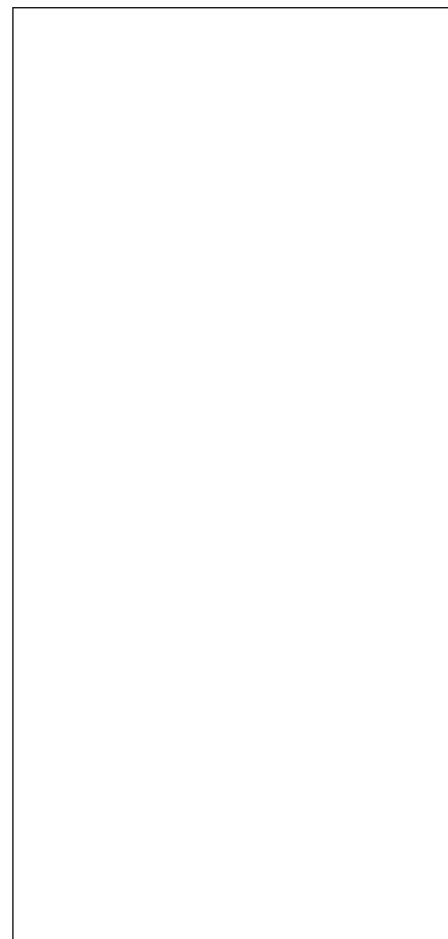
The programme was a low budget version of David Suzuki’s “The Nature of Things” but was in many ways the re-incarnation of Dr. John Grierson’s “This Wonderful World”. This show ran for 5 years and for the latter three years I was privileged to have Dr. Logan Stanfield (a world authority on cancer and holistic healing) as my co-host. We dealt



Figure 13. 1982, Boston Marathon.



Figure 14. 1981, CSEG President with Executive: Denny O’Brien, Brian Curts, Judi MacDonald, Jim Wasilenkoff, Graham Millington, Larry Fichtner, Duncan Carswell.



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Figure 15. 1974 With Bill Evans, CSEG Best Paper Award.

with many things in the medical world, the natural world, the oil business and had a significant following.

Another extracurricular activity

at Petrel was the lunchtime dedication to running miles at the “Y” or Prince’s Island and the river trails. We had a core group of fine runners including Bill Clack, Frank Chappel and Paul Viney and I finally made it to the Boston Marathon in 1982 (Figure 13).

The CSEG

As soon as I arrived in Calgary I became a member of the CSEG and enjoyed the technical and social aspects. It was a great way to meet people and I was really impressed with the number of “giants” in the business. These were people who had contributed to the industry from the post-Leduc days and included Dick Baillie, Pete Bediz, Bill Blair, Bob Carlyle, Carl Chapman, Norman Christie, Jock Coull, Ed Fulmer, Peter Gretener, Frank Halpenny, John Harding, Roy Lindseth, Warner Loven, Earl Mahaffey, Dick McCaffrey, Sandy MacDonald, Ken Morrison, Ernie Pallister, Wes Rabey, Ed Rutledge, Dick Sigfried, Tom Sommerville, Bud St. Clair, Bill Stroup, Gerry Sykes, Pete Savage and a host of others. They had many great attributes and I admired their entrepreneurial talents. This list includes many of the key pioneers in building the geophysical business in Calgary and taking it to the standard that it achieved. It seemed clear to me that the Leduc discovery of February 1947 provided a natural magnet for all the bright young people all over the country who had been engaged in World War 2. This created a kind of Klondyke rush to Alberta and attracted many talented and entrepreneurial individuals.

I became particularly close to Norman Christie and he introduced me to John Hollister from Colorado School of Mines. As I sat and listened to these two pioneers talking about the historical origins of our business I realized that the story had to be written. In my then capacity as Editor of the CSEG Journal I offered to write the document and solicited information, anecdotes and photographs from both the CSEG and SEG memberships and received a mountain of material. This eventually was realized as “Traces through Time” the

magnificent document written by David Finch and published in 1985.

I served on various CSEG Convention Committees and eventually was elected

President in 1981 (Figure 14). I had written a paper in 1974 which won the Best Paper Award from the CSEG (Figure 15). It was entitled “Contouring and the Contour Map: a new perspective”. I think it would have been the first paper to use the dual phrase title separated by a colon. I had

a very productive relationship with Sudhir Jain. We presented several papers including one entitled “The Application of Optimal Wavelets in Seismic Inversion” which I feel was the first genuine wavelet paper to come out of Calgary.

My long association with the CSEG has been most rewarding. I cannot imagine a more professional and socially engaging organization. It has been a privilege to serve the society.

Teaching Courses

I had acquired a taste for presenting papers and gave talks on recruiting trips as well as being on the speakers’ list for PRCF (Petroleum Resource Communication Foundation) which gave me the opportunity to give the Energy Day Luncheon Presentation at the Canadian National Exhibition in Toronto in 1978 for then Energy Minister Joe Clark. I liked the public forum and with Neil Hutton built a two-day “Geophysics for Geologists” class for the CSPG. Eventually I extended this to 5 days and it has become a Calgary perennial.

I got into teaching courses for Petrel as a means of advertising our consulting tools and techniques. I was thrilled to be able to teach geophysics and put my own spin on it for non-geophysicists. Offers to teach came from SEG, AAPG, GeoQuest, CSPG and CSEG. This is where my professional relationships with Larry Wood, Mike Graul, Pat Lindsey, Nigel Anstey, Bob Creed, Bill Ayrton, Bob Workum, Grant Mossup and Peter Hay were cemented.

Teaching is a unique privilege. One has a captive audience for a limited period of time and the instructor must illustrate, educate and entertain. I have been criticized repeatedly for overdoing the theatrics and trivializing the mathematical and physical aspects but that is simply my style. I am thrilled with the opportunity to plant some understanding and seeds of curiosity into young and enquiring minds. I like building analogies and improvising on the floor. There is also the philanthropic element of giving something back to the system that gave me so much in return. (Figures 16, 17).

I built a repertoire of courses for geologists, geophysics and engineers as well as introductory courses on the Upstream Petroleum Industry for non-technical personnel with oil



Figure 17. 2002, Calgary, “Seismic Workstation Interpretation for Geologists” with Mark Sun.



Figure 16. 1990, Jakarta, Indonesia. “Introduction to the Upstream Petroleum Industry”.

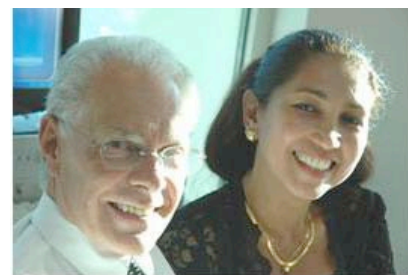


Figure 18. 2005, With my wife Umi.

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companies as well as legal and accounting firms associated with the oil industry. This slate of courses took me to many countries including Malaysia, Thailand, Singapore, Indonesia, Papua New Guinea, Australia, New Zealand, India, Kuwait, Egypt, Sudan, Algeria, UK and the US. The cultural benefit of these visits cannot be overstated. In SE Asia it is a requirement that the instructor has grey hair, an indication of maturity.

On my first visit to Malaysia in 1989 I met, and later married, Umi (Figure 18). This second marriage has brought a whole new cultural dimension to my life and it might never have happened without the invitation to teach a course in Kuala Lumpur.

Post Petrel “Independence”

In 1986 I resigned from Petrel and found myself in a hiatus. An offer to teach a semester at the University of Calgary as a Visiting Professor was accepted: an invitation to be a Distinguished Lecturer for AAPG (1987) was received; I decided to try to go it alone and see if the teaching and consulting business could keep me occupied.

I have never quite got used to the term “consultant” since I do not think it the appropriate one. However, I would acknowledge that it is the standard reference for the “hired gun” or “mercenary” geophysicist that I have chosen to become. This might explain the origin of my business card (Figure 19a, b), which came from the 1950’s TV western, “Have Gun Will Travel”.

Perhaps leaving Amoco and then PanCanadian at an early age and going into the consulting business with Petrel gave me the confidence that I could possibly survive on my own. The big question marks are the levels of industry activity today and in the future, one’s ability to compete in the market and one’s ability to stay healthy and function as an entity of one. In many ways then I have been extremely fortunate.

One of my fundamental survival techniques is to try to identify then build strategic alliances with the bright young men who are doing things in the industry that I respect. John Varsek has been one that I have “plugged into”. He is a unique talent with a rare vision and personality and I enjoy our frequent meetings when he keeps me updated on industry developments. Mark Sun is another phenomenal talent who continues to amaze me with his



Figure 19a. The original idea for my business card logo.



Figure 19b.

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developmental surges on Earthworks. I am privileged to teach the CSPG “Seismic Interpretation on a Workstation” course with him.

In 1989 I re-connected with my old friend Larry Wood who had just coded the Shell symmetrical sampling acquisition/processing philosophy as presented in the papers by Leo Ongkiehong and we took the techniques to the market. While industry acceptance was high, it was clear that the methodology was only suitable for 2D data and the industry was looking for a 3D solution. This sat in abeyance until Vermeer published his 3D solution involving the cross-spread gathers in 2000. Later I got a phone call from Jim Laing of Apoterra suggesting a chat about the Vermeer paper and he subsequently developed software to generate the cross-spread gathers and the complimentary 3D f-k filter. This approach provided ideal signal-to-noise data in many 3D surveys.

Larry Wood remains a dear friend and colleague and is simply the most complete and innovative geophysicist I have ever known (Figure 20). His credentials are impeccable. He gave the first paper on wavelet processing, invented mixed phase deconvolution, gave the classic paper on resolution of zero phase wavelets with Bob Kalweit, and is currently manager of research at Geotrace in Houston. While acquisition, processing and interpretation have always kept our interest, we are both essentially wavelet and pre-stack advocates.

The last ten years or so have included a variety of consulting assignments, teaching courses, being a member of the Advisory Board of

Rosetta Exploration in Calgary and a Director of BowLeven plc, a junior oil and gas company headquartered in Edinburgh, Scotland, with a large asset offshore Cameroon. I have been privileged to write a series of articles for the CSPG Reservoir entitled “Simplifying Seismic” with the intent of doing just that.

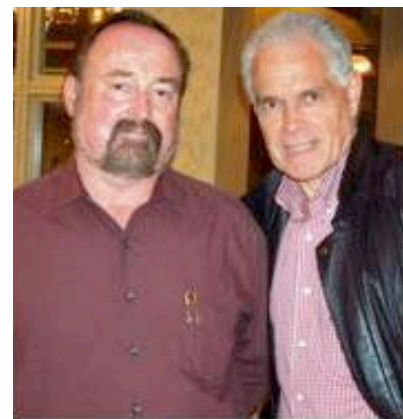


Figure 20. 2003, With my oldest friend Larry Wood.

I continue to marvel at the developments in our industry. The talent pool of human resources is as good as ever although the availability of “coaches” and “mentors” that I had access to, is sadly lacking. I am honoured to have good relationships with many of the “giants” of the modern industry and would single out Rob Stewart, Larry Lines, Brian Russell and Dan Hampson, John Varsek, Mark Sun, Rob Shugg, Frank vanHumbeck, Larry Mathews, John Card, Bill Goodway, Don Lawton, Sam Gray, Bill Quirk, Norbert Bernoth and my old friend Michael Enachescu who always insisted that we keep the geology in geophysics. I would add that the “geology always comes first”. It was Michael who arranged for me to give the End of Millennium talk to the CSEG Luncheon in December, 1999. An honour that I shall never forget.

So in hindsight it is as much about the people as the science, the human relationships as much as the technical developments and I am thrilled to have been a part of it in Calgary for the last 37 years. I realize that there is much that I do not understand in our business but one consolation of getting older is the probability of getting wiser.

The decision to come to Canada has turned out to be the most significant of my life. Along the way my children grew up and had children of their own. Being a grandfather is one of the special things in life which brings a great deal of satisfaction. Somehow I stay busy and when my wife and family and friends ask me about retirement I admit to not having any definite plans. Quite frankly I cannot let the business go and have no alternatives identified. Like Charles Dickens’ Mr. Micawber I believe that “something will always turn up”. *R*

Easton Wren
November 27, 2005

