

# Phil Cooney interviewed by Peter Gunn.

This interview is presented as questions and answers between the interviewer Peter Gunn and interviewee Phil Cooney.

## **Introduction**

Phil, you have been a stalwart of petroleum geophysics in NSW and you have worked in various regions of the world.

In this interview we hope to get some insights on your career and observations of how things worked over time and in various places. From your supplied CV we understand that you graduated from Sydney University (BSc 1965, MSc 1969) and after various jobs working as a teaching fellow at the University of Sydney and for the Geological Survey of NSW, as a geophysicist, you joined Esso Australia/Exxon Corporation in Sydney in 1969 and continued working for them until 1991 when Esso decided to relocate to Melbourne. You decided not to move to Melbourne. From that time until the present you have worked as consultant petroleum geophysicist based in Sydney.

We hope you can give us considerable insights how it was to work for Esso.

## **Interview**

*Question 1: At the time you joined Esso, the company was already developing the large gas and oil reserves in the Bass Strait in conjunction with BHP. Esso had probably the largest team of oil explorationists in Australia. It also had a substantial mineral exploration division at the time. I understand that Esso had an excellent training program for young graduates.. Can you expand how it was to join the Esso team? For the record, after completing an MSc in geophysics, I was employed by West Australian Petroleum ( WAPET) , a consortium operated by Chevron, in 1967, which had just discovered the Barrow Island oil field. Of 12 young geophysics graduates, like me, I only remember one staying with WAPET more than two years. I seems to me that Esso must have inspired its young graduates more than Chevron. I understand that Ken Richards, one of the founders of the ASEG was Chief Geophysicist during part of your time with Esso Australia. I was once told that if a new Esso recruit did not get a third year pay rise the was a clear message. Ex Esso staff seem to have a camaraderie exemplified by the fact that they always have a table reserved for ‘ESSO Old Farts” at the Petroleum Society Melbourne Cup lunches in Sydney.*

Question 1: I joined ESSO Australia in January 1969 having just completed a MSc in Geophysics while working as a Teaching Fellow at the University of Sydney. At the time I was considering a career in academia teaching Economic Geology. Sydney despite having a Department Head, Prof. Charles Marshall, whose background was in coal, was very much a “hard rock school” and I thought that completing ESSO”s three year training program recommended to me by a former

classmate at the University of Sydney, Phil Towey, would fill in the gap in my background. I stayed with Exxon for 22 years.

My job interview was disconcertingly low key consisting of a sandwich in a coffee shop under the old British Tobacco building at which I was offered employment as a geophysicist. My familiarity with gravity and magnetics was considered valuable in a exploration department dominated by seismic and well petrophysics.

I never regretted joining ESSO (later renamed EXXON). New junior hires like myself shared an office with an experienced explorationist, undoubtedly the best way to learn quickly and permanently. I'm sure that all our mentors had been selected for this job but I was very lucky with my room mate Fred Murray. The training program involved exposure to all aspects of hydrocarbon exploration including spells as a wellsite geologist and working in seismic acquisition and seismic data processing. The training period finished with an assignment to EPRCO (ESSO Production and Research Company) another Esso affiliate based in Houston Texas and essentially a private university.

Comparing EPRCO to the Geology Dept of the University of Sydney was like comparing a high school with a primary school. Some of the most famous geoscientists in the world worked there, all it seemed happy to talk to you. We were able to talk to and work with such authorities on seismic stratigraphy and sequence stratigraphy as Robert Mitchum and Peter Vail.

I was also delighted to find that ESSO believed in Continental Drift and appreciated its application to petroleum exploration. Although they changed their opinions later, the Geophysics Section of the Geology Dept at Sydney, (based on their work on paleomagnetism) was for many years the only proponent of this theory at Sydney despite being ridiculed by the others.

Working with Esso was extraordinarily rewarding. The work, mainly seismic interpretation was fascinating. We were making discoveries. We were at the leading edge of technology. We were respected, I might even say spoiled by our then exploration manager Ken Richards. The money was good and the allowances generous especially for the overseas assignments which were frequent. We were at the leading edge of technology. We young Australians believed that we were the best "the trouble shooters" for EXXON. There was a great "esprit de corps"

*Question 2: You must have witnessed amazing technical advances during your time with Esso, Digital processing and deconvolution was probably well established by the time you joined Esso but other advances such as migration and VSP surveys would have come in your time.*

*Can you tell us how Peter Vail's group developing seismic stratigraphy and sequence stratigraphy influenced seismic interpretation.*

Question 2. There have certainly been great changes in my 50 years in exploration, particularly in seismic acquisition and processing. In 1969 seismic data usually with dynamite as an energy source (both onshore and marine) was already being recorded in analogue format on magnetic tape but paper records were still recorded in the field for quality control and onshore for a preliminary interpretation. Multi-fold data was very low fold usually 3 or 6 fold. With high energy dynamite sources this was not such a problem. With the replacement of dynamite by lower energy air-gun

sources, which were much easier on the marine life, higher fold became necessary and 12, 24 or even 48 fold became common. Processing was digital very early and a first step in seismic data processing was conversion of the field data from analogue to digital format.

Originally seismic data was exclusively 2D and the seismic sections were printed out on paper and interpreted using coloured pencils. Values of the times on the interpreted sections were picked and plotted on a base map by hand and then hand contoured. The process was slow but it gave you time to think about what you were interpreting. The data was limited and a good knowledge of the local geology and structural style was necessary for a good interpretation. Simple computer mapping programs did exist but could not incorporate this background information and looked ugly mechanical and non-geological. There was quite a lot of art involved and an explorationist's maps were as distinctive as his (or rarely) her signature. Some maps were truly works of art particularly if coloured. This was not just art for art's sake, a good-looking map was more likely to sell a prospect.

The conversion of a time structure map to depth was a science in itself often left to a specialist "velocity group". Originally well velocity surveys were simple check shot surveys but by recording the seismic wavelets recorded at each level and not just the first arrivals it was possible to generate a synthetic seismogram that could be tied directly to the seismic section through the well. This enabled the seismic section to be tied to the geological horizons in the well with much greater confidence.

I was very lucky to be involved in one of the earliest 3D surveys over the Arauca Field in Colombia near the border with Venezuela. The resulting mountain of paper sections forced a rapid change over to the display and interpretation of seismic data on computer work stations.

The data cube resulting from a 3D seismic survey was initially interpreted using vertical seismic sections usually perpendicular to the regional structural strike and horizontal time slices. The interpretation of the latter involved tracing the same geological horizon (or rather its seismic signature) from one time slice to the next and resulted in a time structure contour map. Careful mapping could reveal the presence of faults and channels on these maps.

Horizon datumming of time structure was discovered almost by accident while I was working in Kuala Lumpur. Seismic data quality in the South China Sea is incredibly good and very high frequency allowing misties of a few milliseconds to be identified. There was considerable scepticism at head office in Houston as to whether the misties were real or simply noise so a number of time slices were made just below the water bottom where the geology was horizontal. The result was extraordinary. It was like looking at an air photograph. Meandering rivers with their channels and point bars, beaches, backswamps, tidal channels and lagoons were displayed. Elevation correction programs were swiftly modified to enable datumming on a non horizontal interpreted horizon to enable the same spectacular displays.

It is due to the excellent quality of the seismic data in the South China Sea that Shell shortly afterwards and quite independently made the same discovery.

Significant advances in the successful migration of seismic sections first in time and then in depth occurred with the acquisition of 3D data and the determination of the true dip direction.

*Question 3: You have worked in various countries in various roles, can you elaborate on this subject. Don't leave out the part how you met your Spanish speaking wife in Columbia. For the record I met my non- Anglo Saxon wife in North Sydney.*

Question 3: I consider myself very lucky to have gotten onto the foreign circuit with ESSO/EXXON. I originally completed my training with Esso Australia in 1972 with 5 months at EPRCO (the research affiliate) in Houston followed by a winter with Imperial Oil the Canadian affiliate at Edmonton. I returned to Houston in 1974 to work with Exxon USA in their Gravity and Magnetics Group which was a bit of a backwater and I requested a transfer back to Australia. In 1979 I was offered a position in Bogota Colombia with the local EXXON affiliate Provincia Petroleum. This was a hardship posting and somewhat dangerous as much of the countryside where we were operation was controlled by or disputed with the anti-government guerillas. The lack of interest in working in Colombia by more senior professionals was greatly to my advantage and I wound up effectively being Chief Geophysicist and in charge of geophysical operations. The work was interesting and exciting and I guess a bit dangerous which being single I enjoyed. I met my wife Marina there who married me under the impression we were going on to my next assignment in Buenos Aires. Unfortunately in 1982 the Falkland Islands war intervened and my Argentine contract was cancelled. Fortunately Esso Australia took me back, but Marina was not initially happy being at the far end of the world and accused me of marrying her under false pretences. The birth of our daughter the following year helped.

*Question 4: Esso was a very important component of both the petroleum and mineral exploration scenes in Sydney. Because Esso was in Sydney many major service companies such as Schlumberger and GSI were based in Sydney. The availability of such service companies attracted many other international exploration companies to base themselves in Sydney. During the 1980s Sydney had an exciting exploration scene. Since Esso moved to Melbourne this has largely disappeared as the service companies and the exploration companies moved elsewhere. Do you agree on this issue? You chose to remain in Sydney and continue as a consultant in Sydney.. What happened with the other Sydney based staff?*

Question 4: In 1985 I joined EPMI (ESSO Production Malaysia Inc.) as Chief Interpreter. This was probably my most enjoyable overseas assignment. There was a great deal of seismic and well activity. We were making discoveries and I really liked my role in training and mentoring the young Malaysian professionals. I returned to Australia in 1990 and only two years later left EXXON taking up the very generous redundancy package offered when the company moved their Australian Head office from Sydney to Melbourne. I immediately found a job consulting for Maraven in Venezuela and remained in Venezuela for seven years including a year in Denver USA working on data from Venezuela. In 1999 I returned to Sydney working pretty well continuously mainly as a seismic interpreter for many clients until my effective retirement in 2014.

I agree that Esso moving to Melbourne was a major blow to the exploration scene in Sydney but the mortal blow was the shut down of coal seam gas exploration in NSW following the example of the Victorian government. This led to the closure of many small exploration companies. The death blow might be the departure of Oil Search the last large Oil Company left in Sydney.

Those geoscientists who left Esso Australia upon their move to Melbourne scattered literally all over the world. Most left Sydney some to Adelaide, some to Brisbane others to Perth. I left for Caracas Venezuela but fortunately kept our house in Sydney.

*Question 5: What were your best consulting jobs? Did Sydney get more difficult as a consulting base as time went on?*

Question 5: My best consulting job? Not an easy question to answer. My most challenging and exciting posting was probably Colombia, my most enjoyable Kuala Lumpur largely for the reasons already mentioned. I returned to Sydney permanently in 1999 and there is no doubt that consulting became more difficult as time went on mainly due to the reasons already described. The industry was not so badly affected by the financial crisis of 2008 but was badly hurt by the oil price crash of 2014. The lack of work resulting convinced me to retire.

*Question 6: You have always been very active ASEG and PESA activities. You are currently Secretary of the NSW PESA branch. This must be tough these days with covid restrictions and falling membership as petroleum companies leave Sydney. The purchase of Oil Search by Santos must leave a big hole. Can you comment on the situation and where you think the hydrocarbon industry is going. Also comment on the diminishing options for training as a petroleum geophysicist.*

Question 6: I have always believed that professional societies like PESA and ASEG have a vital role to play in the education social and professional development of geoscientists. With the panicked reaction to climate change and the blaming of fossil fuels for all the problems of the world while at the same time ignoring their major contribution to the massive improvement in living standards throughout the world in the 20th century, it is difficult to interest young people on a career in the industry. This is a vicious circle in that declining student numbers result in fewer courses being offered leading to fewer students being attracted to the industry or even study courses such as stratigraphy, petrology or geophysics relevant to our industry. Mind you I suspect that the student numbers studying the courses we studied were even then small and these courses would not be offered nowadays when every course must make a profit.

Thank You Phil