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TRIBUTE

Harold M. McNair. The Seventh Horizon.

"You should think about working in chromatography in the future, Michael. There are great possibilities in this field for chemists."

Professor Keith Bowden, University of Essex, 1968.

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Abstract

This paper is a brief account of my 35-year friendship with Harold and Marijke McNair. It was a chance meeting with Harold that resulted in the total refocusing of my career in chemistry. Concurrent with that, several decisions were made that changed completely the lives of my wife and two daughters. I write of my experiences in Harold's lab at Virginia Tech and subsequently his support of several successful job applications in the USA that transformed my life as a chemist and in many other ways. My varied career in chemistry can be characterized in one way by a series of broad horizons that fortuitously opened up to me and maintained my fascination with this science over many decades. My first meeting with Harold was the seventh horizon.

1. Introduction

A chance meeting with Harold McNair altered completely the direction of my family's life. Prior to that meeting my wife Victoria and daughters Katya and Justine had no plans to move out of the sub-tropical city of Brisbane, Australia. It was assumed that I would work as a lecturer in chemistry at the Queensland Institute of Technology till retirement, Vicki would become a lawyer and my daughters would obtain worthy careers, perhaps marry Australians and settle down in this country. But that was not to be.

Several of my chemical colleagues introduced me to Harold McNair during his visit to Brisbane in 1977, purely on the basis that he and I had certain principles of audio-visual teaching ideas in common. At the time my forward-looking department was interested in introducing HPLC to its undergraduate students and Harold offered a visiting professorship at Virginia Tech to train a faculty member in this technique. I applied to my department for the post and was successful.

On the basis of my HPLC experience in Harold's lab and elsewhere in the USA, plus the deep friendship that developed between my family and his, I determined to obtain employment in America in this field. I therefore applied to J. T. Baker Chemical in New Jersey for a senior scientist position during Pittcon 1980. I heard nothing from Baker Chemical for almost a year.

2. Experimental

2.1. Sabbatical 1978-1979

Prior to applying for the visiting professorship, I discussed this dislocation with my family. Victoria had, as always, fully-formed ideas on such a move, and my six and four year old daughters had little say. So we all moved to Blacksburg, Virginia, where our life changed. Here there was snow, four seasons, the Blue Ridge Parkway, Bluegrass music, a college town, the Carol Lee donut shop, Kroger's supermarket, homecoming queens, marching bands, Gilbert Linkus Elementary School and a large number of wonderful public holidays.

The experience was made immensely richer through our friendship with Harold and Marijke McNair and their three children. We were immediately welcomed by them all and through them we made many other friends and immersed ourselves in the culture of America. Harold frequently invited us to lunches and dinners and other social outings with his students and/or his family. His whole family burned with enormous creative energy. We were content to move into their centre and be carried along by them to places we had never before experienced. Within months Katya and Justine had developed southern accents. In spring 1979 we toured the southern states of the Carolinas, Georgia and Florida, marveling at the food, the languages and the history.

I always felt that I had jumped into the deep end of life in America, but I was buoyed up by the immense energy that pulsed throughout the country. My lazy brain suddenly came to life and the faith that Harold had in me did wonders for my self-confidence.

In mid 1979 I completed my visit in Harold's lab and we all returned to Brisbane, where life went back to where it left off in June 1978. More or less.

This sabbatical year would have been the end of my American adventure, except for two things:

- Harold and Marijke's extraordinary ability as warm and generous hosts, and
- My immediate fascination with the whole field of liquid chromatography.

2.2. Life in Industry?

I had almost forgotten about the job application I had made in 1980.

One sweltering summer morning in Brisbane I received a phone call from Laura Crane, principal scientist in charge of lab product development at Baker. She had spoken to Harold McNair about my suitability. Was I still interested in the job? I said yes and flew to Atlantic City, New Jersey for a 2 days interview to be

conducted after Pittcon 1981. I was hired in April 1981. It was an impossible result achieved by the combined faiths of Laura Crane, Harold McNair and Hal Kaufman, J.T.Baker Vice President of Research.

Before I decided to take up Baker Chemical's offer, there were many family discussions about this move. Now the future of my family – Vicki, Katya and Justine – was about to undergo a major change. Not a simple temporary visit to Virginia, but an indefinite period of migration to the United States, where opportunities were abundant.

I would be leaving a permanent academic job in a familiar country for a temporary position in the chemical industry in a new country. Vicki had a year or so to go of her business degree. Katya was 10 and Justine was 8 years old. All would have to leave their friends and a society that was a cradle of their upbringing. It was an enormous decision to make. In retrospect I do not know how I made the decision to leave Australia. My Department Head at the time, Dr. Stan Dyke, said I was crazy. A recession had gripped the USA in the early 1980's with unemployment at 10%. I was hired on a 12 month temporary work visa, with no guarantee of renewal. Laura Crane had begun the process of acquiring a green card, but my job had to be publically advertised and offered to a suitable American candidate. It was the combined effects of the support from my wife, the friendship of Harold and Marijke McNair and the strong encouragement from Laura Crane and Hal Kaufmann that confirmed my decision.

3. Results and Discussion

3.1. Virginia Tech. 1978-1979.

Back in Blacksburg, Harold arranged for me to teach freshman chemistry classes of several hundred students of many backgrounds and majors. They all seemed very smart, very articulate and very good looking.

Then after an appropriate amount of instruction in the basics of GC and LC using a series of brilliantly designed 35mm slide programs, Harold exposed me to many of his live short courses in these fields of separation science. Eventually I was able to speak on selected basic chromatography subjects to attendees at innumerable short courses throughout the United States. Sometimes I could answer their questions. For the first time in my long career in chemistry instrumentation became a major focus of my work. Unlike an infrared or nuclear magnetic resonance spectrometer, which are adjuncts to synthetic work for example, the instrumentation in HPLC is the entire field of this separation science. I became immediately intrigued by the components of the high pressure chromatograph.

A firm understanding of HPLC was made somewhat easier in Harold's lab when my first experience of the technique was obtained via an extraordinarily simple student system. Pressure came out of a gas bottle, the mobile phase was contained in a helical tube of steel, the injector was a loop device, the column was packed with 10 micron irregular particles of bonded silica, the detector seemed to be composed of a UV lamp a crude flow cell and some ill fitting tubing. The chromatograph was displayed on the simplest of paper rolls by ink-loaded pens, which seemed to dry up at crucial times. There was no computer control over the method, sample access and delivery, instrument set up or data recording. Just a few hand-turned valves and injectors. Eventually your liquid chromatograph became your friend – you got to know its foibles and how to treat it well day after day, producing eye-popping results of outstanding sensitivity and accuracy – eventually. But the one thing that remained something of an unknown was the nature of the stuff inside the HPLC column. After all, this was where the separation occurred. How did they create bonded phases and how did they manage to pack 10-micron and all the way down to 1-micron particles so tightly and evenly into that tube of stainless steel. I wasn't going to find out the intricacies of those processes for some time. And how that came about is a truly remarkable story.

3.2. The Chemical Industry. 1981-2005.

In early September 1981 I left Vicki, Katya and Justine at Sydney airport. I would not see them again for 12 months. I had no idea then of how traumatic that separation was going to be. But I knew I was going to have to justify the faith that Laura Crane had placed in me and I was not sure how I was going to do that. I did know that I was going to need to summon all my knowledge in chemistry and the new horizon of science that had opened up to me during that brief idyll in Blacksburg with Harold McNair three years beforehand. The intensity of my work at J. T. Baker helped overcome the real feelings of grief that I experienced without Vicki, Katya and Justine being there. So I began a 24-year chemical odyssey in America working in New Jersey for 11 years and in three jobs in California over a period of 13 years.

My work at J. T. Baker Chemical reporting to Laura Crane for nine years and finally to John Covington for two years, involved participating in the development of a full range of bonded phases for solid phase extraction and liquid chromatography. In 1992 I left Baker to work with Toxi-Lab under Steve Schultheis (now with Agilent Technologies) in Southern California. This company was known as a developer and supplier of systems for rapid drug analysis using high performance thin layer chromatography. The substrate was fiberglass into which silica and bonded silicas could be enmeshed. The technology the Company had developed for producing large batches of thin layer material was truly remarkable.

After two years with Toxi-Lab I moved north to Applied BioSystems in Foster City, reporting to John Wiktorowicz. There I had the great good fortune to meet Joe Pesek and Maria Matyska, who researched and invented new material for HPLC and capillary electrophoresis. My final position – after two years with Applied BioSystems – was a much longer association with Beckman Coulter under Chan Oh. I worked with the immensely talented Chitra Ratnayake, first on HPLC, then capillary electrophoresis and capillary electrochromatography. While Chitra went on to become Senior Staff Scientist I stayed with the Advance Technology Group. Here I reported to Stephen Pentoney and worked in the field of flow cytometry, devising systems for the rapid analysis of cytokines in biological systems.

In 2005 I returned to Australia with Vicki to live again in the same modest house I bought in 1972 and left in 1981.

3.3. A Family in America.

Vicki, Katya and Justine joined me in late September 1982. We lived on College Hill, Easton, Pennsylvania for ten years. Vicki took on a broad variety of positions in teaching, manufacturing and non-profit organizations; and carried all that experience wherever she and I moved. My daughters were signed on to attend elementary, middle and high schools in Easton, where the going was tough. They survived however and scattered over the globe as they graduated from school and then Universities and took up positions in marketing and teaching.

Katya now lives in Brisbane with her partner and son and daughter. Justine lives in Yonkers, New York with her husband and son and daughter.

4. Conclusions

I suspect that every aspect of my life and that of my family would have been substantially different if I had not met Harold McNair on that fateful day. I owe Harold my immense gratitude for his central role in so comprehensively expanding my career horizons in chemistry. This brief account describes just a few of those horizons. They not only cover a dozen fields of this science but also gave me the opportunity of seeing life in many countries all over the globe.