

“Service is the rent we pay for our room on Earth”.

Well, to address what scientific glassblowing is and why I donate money, time and effort, to needy organisations, family and individuals I shall go back a few years... I went to Vocational Guidance in Christchurch in February 1971 after working in the Ballins Soft Drinks Bottle Yard over the summer. I thought that 'I had better look for real job'. A member of staff told me that all the apprenticeships had gone but that there was this job of scientific glassblowing at the University of Canterbury. I was lucky that they pointed me in the direction of a scientific glassblowing job in Christchurch. After talking to the master glassblower, Frederick Downing, I said "**I'll have a go**". So I went from blowing bubbles as a kid, to throwing glass bottles around a bottle yard, to throwing hot glass around a workshop. It took about six months to develop coordination with rotation of glass tubing and then the sophistication of glassware really started to improve. Fred was a great and patient teacher and allowed time to mess about and find out how things worked. He was formative in my glassblowing development. He had worked as a glassblower at the General Electric Company in Wembley, London before the Second World War and then went to Cape Town University. When the war started he returned to help with the war effort and he took a passenger ship going full speed back to **Blighty** to avoid the menacing German U-boats. Half the passengers were nuns being very devout and sober and the rest were passengers drinking up "**like there was no tomorrow**". After WW2, in the dismal economic conditions, Fred and his wife Nina immigrated to New Zealand. Fred had plenty of choice for his talents being offered a position at the Department of Scientific and Industrial Research in Gracefield (Wellington) and at the University of Canterbury. "Fred" only died last year in his 90s. He had been a keen cyclist, cycling all around England in his youth. When he went to Christchurch he used the trams still running through the city and out to Sumner in those days of the late 1940s and 1950s. I worked there at Canterbury with Fred throughout the 1970s gaining experience and learning a great deal from Fred about glassblowing techniques, how to make vacuum diffusion pumps, condensers, models of DNA (the Side-By-Side model and the Watson-Crick Double Helix), hermit crab shells, glass-glass seals and glass-metal seals, and unusual and bizarre items. Along the way I took on the evening teaching role for Glass History and Basic Glassblowing at Christchurch Polytechnic Institute teaching to NZ Certificate in Science students and Medical students. I even earned the huge pay rate of \$8 an hour which was big money in the 1970s. A crate of a dozen beer quarts was only \$4.50 in those days. By the end of the 1970s, and after being concussed in the Territorials (part time NZ army in the mid-1970s) I felt the need to move on. The army concussion occurred when we were doing a training exercise for our passing-out parade at Burnham Military Camp. It was supposed to give you confidence in your comrades. We were in three rows of soldiers and the outside lines were throwing telegraph poles over the inner column. Two poles collided and I and another soldier were poleaxed between them. Talk about '**seeing stars**' Trev. I faded in and out of consciousness with stars bursting in front of my eyes. They tried to ask me things but the only thing I could remember was my army number at that point, I couldn't even remember my girlfriend's name. **Talk about blood** from perforated ears, talk about 'see the stars'. They took ages to get the army ambulance organised but we eventually were underway and after a week in Christchurch Hospital I returned to the military camp and was put on light duties. The rest were to do their passing out parade but I had already done my own private **passing out parade** exercise! It was a shame as I had become the fittest I had ever been carrying soldiers around on my shoulders, having three big meals a day but still losing weight. The following year I decided to leave the army and they tried to get me to stay by offering me Officer Training. But I decided on academic study as being

better for my health and embarked on a Certificate in Liberal Studies course in 1977. I completed study in Education, Politics, Mathematics and Chemistry over two years and graduated in 1979, the year I left Canterbury and started a Social Work degree at Massey University. But I didn't get much study done when an old flame arrived from Christchurch. Later that year, I got into a hassle at Te Araroa on East Cape when my rain coat was stolen and I was assaulted. I got the assistance of the local policeman and we walked down the middle of Main Street of Te Araroa like the OK Corral (can you hear the old Western music?). He said "I knew it was going to come to this sooner or later". After the showdown and altercation a crayfish-fisherman and his family took me under their wings. The crayfish pot man wanted me to stay saying "I can't pay you anything but you can stay as long as you like". If I had stayed I would have probably ended up marrying one of the daughters. As it was, I had missed meeting up with my girlfriend Patricia in Katikati. **Timing is everything in life!** Back in Christchurch, I worked in Dalgety's Wool Store briefly, then glassblowing for a couple of months at Canterbury, and then nightshift work hanking and doubling at a Carpet Factory. I was then offered Management training at Feltex Carpets when leaving to take up scientific glassblowing again at Massey University. I needed the glow of glass and creativity in my hands and mind but I often wonder at what would have happened if I had taken alternative career paths...

There are lots of uniformed comments about scientific glassblowing. Often it is suggested to me that you must need strong lungs. But you don't have to blow hard if the glass is heated sufficiently. That requires a balance however as if you get the glass too hot you can lose control of the work you are doing. Some things actually work naturally to assist you in making evenly thick glassware. When you heat uneven glass and then blow it out the thicker portion will stay hot longer and therefore stretch out more. Then if you repeat the process a few times the glass will become even. The key to glassblowing is in even heating and rotation and keeping control of the hot glass. Usually, scientific glassblowers start heating glass using the left hand and as it softens at the softening point the right hand comes into play to control it. Glassblowing is partly art and partly technological knowledge and skill. It can take six months for someone with the feel of it to acquire basic skills and start to make sophisticated equipment of good use. Important aspects are not heating the standard glass (borosilicate or Pyrex) too rapidly initially as it can shatter from heat shock. When items are created they require annealing to get the stress out. To remove tension and compression strains glassware needs to be put through an annealing process where the glass goes up through the strain point at about 300 degrees Celsius and then up to the annealing temperature at 565 degrees C for at least thirty minutes. The thicker the glass is the more time is required. The giant Mount Palomar Telescope lens required three months to anneal and then cool down. Now, with modern technology, large telescope lenses are made in segments like cheese segments and then put together.

At UNSW, I have a diverse clientele and am often asked to do glassware of both a common nature and weird and wonderful things. Glassblowing Workshop clients have been universities, research establishments, military research groups, hospitals, music schools, and businesses. At the four different universities where I have worked in over four decades of scientific glassblowing I have made condensers, thermometers, ship's barometers, fractionating columns, Woods Horns for dangerous substances like beryllium, 3-stage high vacuum diffusion pumps (mercury and oil types), glass to glass and glass to metal seals, artificial insemination cups for Lamb XL, sex-change tubes for post-operative recovery, ear suction, hermit crab shells (early 1970s), and alternative models of DNA. The sex-change tubes were unusual. Fred asked me if I cared to make them and said I didn't have to if I didn't want to. But, being professional, I took the work on and constructed six tubes in

consultation with the client. For the UNSW I do a Monday run to the University of Sydney to drop off and pick up glassware and for getting new orders. Sometimes I do consulting, and occasionally I have done 'in-situ' glassblowing at the University of Sydney. In-situ means doing in the situation or on location as in laboratories etcetera.

The construction of the hermit crab shells for the Botany Department at Canterbury University in the 1970s was interesting. I was asked by Fred Downing, the senior scientific glassblower, to see if I could come up with clear glass shells so scientists could see what the crabs got up to. I developed a concept from scratch and wound small glass rod around a larger glass rod core in a spiral. Then I covered the spiral with a glass cover and tapered it down blowing as I went. I completed the shell with a sealed nose and an open shell mouth for the crabs to enter. The only trouble was the crab wouldn't go in! It turned out that the crab wanted a shell spiralling in the opposite direction and so I modified the design and did what the crabs wanted. I humbly realised that they knew better than me. They then happily went in to their new vitreous abode. Marie, an Irishwoman I knew at the time, the mother of my girlfriend Patricia, said "***talk about invasion of privacy***".

The science aspects of making alternative models of DNA were also interesting. There was the Side-By-Side DNA model and the well-known Watson Crick Double Helix model. The idea with the Side-By-Side model, developed by a technician and an academic at the University of Canterbury, was that it would require less energy in splitting and replication than the double helix where all the bonds would have to part. The Side by Side Model wasn't twisted but could easily part though still having the same molecular positions. And so my job involved making up very large glass models using both the large Heathway glassblowing lathe and free form using glassblowing hand torches...

Over the years I have progressed in the world but ironically all my moves have seen me go downwards in a physically literal sense. At Canterbury University my workshop was on the 5th floor overlooking playing fields, the Art Department and a car park. That was good for one's spirit and work. At Massey University I was initially in Tower C of the Department of Chemistry and Biochemistry with high windows I couldn't see out off. Then I assisted with a workshop redevelopment project in Tower A about the 1990s which gave me ground floor windows. At the Research School of Chemistry, at ANU in 2007, I was once again enclosed in a dungeon. And now, I am in the Lower Ground floor area of the Chemical Sciences Building, in an area designed for plant equipment. So in a funny sense, though I have progressed over the years I have always been heading down in the world. Perhaps the drop in height corresponded to changing political and economic views. The 1980s were a time when Liberal Market mantra started to take hold and the destruction caused by User Pays concepts. My background has been egalitarian and liberal and in the social-democratic tradition which is the antithesis of Liberal Market dogma. I've also ascribed to the view that cooperation and sharing is far better than competition and greed.

I have been a member and officer in various glassblowing societies and am still in a few. I used to be a member of SAG, the Society of Artists in Glass. In the summers of the 1980s I used to go to Wanganui Community College and engage in artistic glassblowing and making paperweights, vases, plates and other decorative glassware. It was a creative as well as social time. I made a nice blue scalloped plate once having initially started making a vase. I blew it out, spun it wide and then when flat gave it a shake. Hey Presto, a beautiful blue glass plate. It was a treasure but I gave it away as a raffle fundraiser for the Palmerston North Blues Bridge Day which I organised. We played cards using

blues-themed scoring pads, had blues music in the background, had quizzes of blues and jazz history (who was Bessie Smith?) and had a blues/jazz band playing in the evening to dance to. It was very successful and the first time the PNCBC had ever had a band playing. At that period, I had won, with various partners, junior and intermediate championships but haven't played much bridge for years now. I was also a social organiser for the Faculty of Science at Massey and organised many events and trips for the members. I often found it easier just to organise the whole thing myself. We'd go to places like the volcanic centre of the North Island of New Zealand or to Kapiti Island for the pleasure of enjoying nature and birdlife. I have assisted with professional glassblowing organisations as well having been Secretary of the New Zealand Society of Scientific Glassblowers and International Liaison Officer of the Scientific Glassblowing Society of Australia and New Zealand. Currently, I am still a member of the SGSANZ and a member of the British Society of Scientific Glassblowers and the American Scientific Glassblowing Society since the early 1980s. With the BSSG, I completed my scientific glassblowing Certificate of Competence examinations in 1988. It was funny though as Fred didn't believe in certification but in judging on what you could do. He was against the early moves in the 1970s to require a certificate for work roles. He was against the moves in The Netherlands to require certificates and said "one day you will need a certificate to go to the toilet".

I like to write and study as well and did a double major in History and Politics at Massey University (graduating in 2003). It didn't just include those main BA subjects however but included music (Medieval to Modern, Music for Stage & Screen), The History of Sport, Videotaping (we redid the Cheese-maker's Ad from NZ television which was about '*good things taking time*', that is cheese-making and developing close friendships), Public Relations, Public Speaking, Film, Creative Processes, Drama, International Relations, Management, Labour Studies, and Creative Writing, etcetera. From 1978 when I started Liberal Studies at the University of Canterbury, I have completed that BA degree and Certificates in Labour Studies, International Relations and Art. It would be nice to do a part-time MA here at the UNSW and become an alumni as well as a dedicated staff member.

As a work-alone scientific glassblower, I find the need to meet up with other glassblowers to keep abreast of glass technology developments and to be in the loop so to speak. Glassblowing symposiums have given me the ability to share with my peers and to enrich my life as well as to give to others. I have attended a few of the American Scientific Glassblowers symposiums and have been involved in the programmes learning glassblowing techniques and doing workshops. At the Boston Symposium I was able to do two workshops on Vacuum Technology and Lasers at Harvard University. Whilst there I was also able to see the wonderful glass art of the Blaschka Brothers who made glass copies of botanical species for student study in the cold American winters. The sophistication and replication is amazing.

http://www.hmn.harvard.edu/on_exhibit/the_glass_flowers.html

For many years at the ASGS symposiums, glassblowers were encouraged to make and give away glassblowing art for auctions where the proceeds would go to worthy charities. Shorty Yeaman, a short Texan with a big Texan hat, was often the auctioneer and made a lot of money for charities from his enthusiasm and the generosity of glassblowers such as myself. Of course, I have given away my art glass pieces and have nothing to show for it now. On an occasion a few years ago I was looking at a possible summer glassblowing job in Alaska teaching passengers from Alaskan cruise liners. The only problem was that the people wanting glassblowers wanted to see my glass art work which had long gone previously. Still, I feel good for helping others. And helping has often been a

win-win situation for funds given to charitable causes comes off taxable salary. Not that I have a lot of money to give away and you don't get it all back. I am one of those doing housesitting to avoid excessive rents in the Sydney area and so that I can help my offspring and donate to worthy causes. Maybe I'll move out west in the distant future. But for now I can't afford to retire as I don't have a home and I support my son and daughter, Liam and Zoë, who are trying to get on their feet jobwise and economically towards the end of their tertiary study or upon completion. Liam who has done Geology & Geography is training to work in an emergency control centre and Zoë is doing a four month Design contract at a New Zealand government department in Wellington.

I am grateful for the times I have lived through (though living in earlier times would have been nice as I don't like the society we are becoming) and the support received when needed. Because of that, and because of my social democratic background, I wish to assist individuals, charities and institutions of merit. My wife Sue, who died in 2001 of lung cancer, was of the same view. She never smoked but suffered from heavy passive smoking around her. I gave up smoking before I met Sue, on the 24th of May, 1982, so haven't smoked for more than half my life (I only smoked for about three years). Sue was grateful for being paid to go through Teacher's College. In those days governments and society recognised the truth that education is a social benefit for the community and not merely a personal benefit. My money has been directed to organisations such as NIDA, Headway, Cancer Council, Salvation Army, the UNSWWG Programme, SHF, ANMM, family members and worthy individuals and friends who are hard up. Some people have been left in precarious situations by years of government mismanagement and hardnosed attitudes. But I don't ascribe to the way things have gone and put myself into doing my best or giving wholeheartedly. When moving to Australia I rapidly worked towards acquiring Australian citizenship as I believe if you live somewhere you embrace the culture. I acquired dual citizenship some time ago. I donate and I volunteer. Some of the organisations I have served with, or worked on behalf of, without pay, include the Youth Hostel Association (a life member), Manawatu Museum (life member), Electoral Reform Coalition (NZ, Palmerston North Convenor or the ERC), Headway (for brain-injured people), the ANMM (Darling Harbour), Lions and the Sydney Heritage Fleet. In the SHF, I am a crew member of the 1874 James Craig sailing vessel, the Steam Tug Waratah, the Vice Regal Steam Yacht Lady Hopetoun, and the Motor Schooner Boomerang. Some of the service is hard, some very pleasant and emotionally uplifting. It is pleasant cruising on the Harbour on a sunny day or with full sails in a good breeze upon the ocean blue with dolphins leading the way. It may not be everyone's 'cup of tea', or their way, but it is **My Way** (apologies to Frank Sinatra). "Service is the rent we pay for our room on Earth".

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