

PICK OF THE CROP – THE EARLY YEARS OF NANCY MILLIS

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MORRISON, S. 2010. Pick of the crop - the early years of Nancy Millis. *Transactions of the Royal Society of Victoria* 122(1): ii-ix. ISSN 0035-9211.

I'm very flattered to be asked to open the proceedings today with a paper on the early years of Nancy Millis. I'm a writer, but I was once a scientist and I spent the years between 1972 and 1987 as Jim Pittard's Research Assistant; after that I was a Research Fellow in the Department of Surgery and in 1990 I took up a Literature Board Scholarship and became a full time writer.

Nancy was one of the first people I met here; we got along famously and became good friends and have remained so ever since. For me she has been an inspiration and a mentor.

The inspiration comes from Nancy's imaginative powers, her capacity to keep her head in difficult situations and to find resolution when clashes of interest have to be resolved. As a mentor, she taught me that you need to be tough and true to yourself; although Nancy's self and mine are quite different, just as our backgrounds are.

Nancy, born in 1922, went first to the local state school in Brighton and then to Merton Hall while Stanley Melbourne Bruce and James Scullin were fighting bitterly over unionism on the Federal stage and Robert Menzies was beginning to assert himself in Victorian State politics as the champion of Melbourne's middle class, the people among whom Nancy began her life. These people, who were often trying to run businesses, faced a life that was disrupted by strikes. The first twenty-two years of Nancy's life were characterised by the struggle between business, small and large and organised labour. She was at university when Menzies founded the Liberal Party and the politics of thrift, hard work and private industry, became the formative forces of the Australian way of life.

I, on the other hand, am a baby boomer and had a public education in the ACT, during which Menzies rose and rose and finally went into eclipse – Liberalism was challenged from within by Gorton while I was at university and Whitlam stepped in after I graduated and took the middle ground for the Labor Party. I mention this to give you the breadth of Nancy's career, the position from which I see Nancy, and the changing atmospheres she has faced in her various manifestations, the last of which was Chancellor of La Trobe Uni – a university set up for the education of the likes of me and whose ethos has been determined by people of my generation. Nancy needed to be both rational and flexible to cope with the changes that have marked her career. While the political rhetoric has changed in response to world events and social pressure, Nancy has always put her trust in science as the way to solve the problems that beset us.

In Figure 1 she is deliberating over what to do with a fairly new discovery, her foot. She could put it in her mouth, but she seems to have other plans for it as she eyes the photographer from her possie beside the handsome skirting board of 31 Drake St, Brighton, her childhood home.

Drake St was high, wide and handsome and promised a large world for a large brood. There were six Millises, of whom Nancy was number five: the sixth, Tom, arrived when she was still very young and he and Nancy were a pair against the older cohort. The house had been built in 1909 in red tuck-pointed brick, it had a welcoming, symmetrical façade, with a generous return veranda running across the front and down both sides. There were eight principal rooms and each had floor to ceiling sash windows through



Fig. 1. Nancy, 1922.

which a tribe of lusty boys would hurtle from their footy and cricket on the tennis court out the back where tennis was never played, although there was ample room for all kinds of other pursuits including vegetable and flower growing (Figs. 2 and 3).



Fig. 2. Frank Millis, Nancy's father, among the stocks and gladioli towards the front of the house.

The Millises were in the wholesale fruit business. Nancy's grandfather, an Englishman by birth, had begun the family store at the Western Markets in Melbourne. Frank, Nancy's father, who was a tall, dark-haired, blue-eyed man with a prominent chin, was part of the business, along with his three brothers and two of his seven sisters, Flo (with a jaw like a prize fighter) and Lizzie (Fig. 4). Frank met his wife, Annie, (Fig. 5) whose maiden name was Ellis, in Tasmania when he was in Hobart, buying up apple crops. Annie had finished her schooling in Hobart when she met Frank and was living at home with her mother in Ulverstone: they were married in 1911. By the time the 'platinum blonde' entered their lives, they already had three boys and a girl, Jean, who was nine. Jean was the second eldest and was to have a great influence on Nancy's life. 'She was my doll!' said Jean, who hadn't much time for the sporting rubs that wafted through the house in trails of glory after the boys. Little did she know that the foot that baby was holding by the skirting board was longing to get a kick at a ball. Jean wasn't given to sport herself and her mother protected her from the superfluity of males in the household. 'I can't even remember making my bed!' she told me when I asked her if she was treated specially because she was a girl.

The baby was an easy-going child, which was just as well because she was still being bottle fed when her mother was taking her every twelve weeks to an eye specialist in town; the sight in one of her



Fig. 3. Frank Millis in the rhubarb patch.



Fig. 4. L–R back: Tom, Liz, Lesley, Flo, Frank (Nancy's father), Fannie, Alfred. L–R seated: Nellie Victoria, Alfred and Fannie Millis (Nancy's grandparents), Edie. L–R front Alice and Ida.

eyes was very much weaker than in the other and there was a real danger that she would lose it altogether as the other eye became dominant. Even as a tiny child, Nancy had to wear large, sight-restoring spectacles. 'She was awfully good with them,' said Jean, 'until she was tired.' Then she would rub her eyes, the specs would be thrown aside, sometimes on the quiet, causing everyone to go searching. The malfunctioning of that eye continues to this day. In another family, it might have been made the centre-piece of Nancy's life, but at number 31 Drake Street, it wasn't.

Nancy had a calm and capable mother in Annie, who had to ensure that the lives of eight people ran smoothly in a house that had only one bathroom. It was a heritage bathroom if ever there was one, with a lead floor that any child of today wouldn't be allowed within twenty metres of. Several boys might have crowded into it at one time, but women in the house, and the women sometimes included Annie's unmarried sister, meant that ablutions would have to be organised and appropriately staggered. Breakfast was always a full blown affair based on the rolled oat and eaten around the family table at the end of the great hallway which debouched into a copious dining space, adjacent to which there were stairs down to a well stocked cellar – there was always a tippie available at Millises' and a great many people would drop by to partake.

The family weathered the Depression well – there were always plenty of fruit and vegetables and Annie, though she couldn't cook an egg when she first



Fig. 5. Annie (Nancy's mother) between two of Frank's sisters, possibly Fannie (left) and Ida (right).

came to Melbourne, became an excellent cook as the family grew. Plenty of food there was, but frills there were not. Millises great and small took cut lunches with them and were consigned various tasks, which they were free to trade, but not free to leave undone. In the afternoons, while children did their homework in the sitting room, Annie darned socks in the spirit of those who paint the Sydney Harbour Bridge, endlessly.

Frank Millis rose and left early for the markets and somewhat later Flo and Liz, who lived nearby on the Esplanade at Brighton, would swing along St Kilda St in their ancient Italia to pick up the Melbourne Grammar contingent and drop it at Domain Road. It was the garrulous Flo who drove and, according to both her nieces she was 'a menace at the wheel' – it was only in the late 1920s that white lines started to be drawn on Melbourne's roads to indicate which side you were travelling on and seasoned motorists treated them as a restraining measure for the riff raff.

As Nancy grew, Jean realised that her little sister wasn't quite the dolly she'd been hoping for; for instance, when given a dolly of her own to play with, the child wept for want of a football. There was a family photograph, now lost, alas, of her little brother, Tom, seated proudly in his billy-cart, and in the background, Nancy is swinging upside down from a tree with her glasses on and knee length bloomers on full show. She brazened it out with the boys, a thin little blonde who wanted sporting glory, but had to be content with the position of 'lowly fielder' in the

family cricket side. She was good at sport and this began to show when, after state school, she graduated to Merton Hall. By this time, Jean was well finished school and would have been in her third year at the University of Melbourne, doing a Science degree, majoring in Biochemistry (Fig. 6).

Nobody in the Millis family had been to university before Jean, and none of the Millis boys were to go. Two of the boys ended up in the family business and two became accountants, so why was it that Jean went to university?

She was good at school and, at Merton Hall the maths and science teaching were excellent; furthermore, the girls were encouraged to look for more in life than husband and family. When Jean announced her intention to do biochemistry, her father humoured her, saying she could take a teachers' college scholarship and be a teacher. But Jean wanted to be a biochemist and it was her mother who intervened on her behalf. Her father's answer was 'Well you can give it a year...'

'He didn't expect me to pass!' Jean snorted. And, of course, she did pass. She passed well enough to enter the MSc stream – there being no PhD in Biochemistry at Melbourne then.

So, while Nancy was at school, Jean was going from strength to strength, eventually writing her MSc and entering the Biochemistry Department as a Demonstrator. By the time Jean was applying for the demonstratorship, Trikojus was in charge and Trikojus, according to Jean, was a blatant misogynist. There was only him, a Senior Lecturer and a single demonstrator – a department of three. Had it not been for the intervention of Pansy Wright, with whom Annie Millis's family had links through Tasmania, Jean doesn't think she would have got the job. However much truth there is in that, the university wanted to start a course in nutrition and it fell to the Biochemistry Department to take on the task. Jean was the right person for the job and went on to become a noted nutritionist.

Nancy was full of admiration and had her sights set on university, too, but it wasn't to be as easy for her as it had been for Jean.

Being a wholesale fruit merchant isn't an easy life and Frank Millis had been at it for many years, travelling, buying and hoisting heavy stuff about. His store supplied shipping lines, railways and exporters. He was up at crack of dawn and at it all day – a consignment of bananas might come in from Queensland



Fig. 6. Jean off to London (left) and Nancy with plaits (right), both c. 1937.

to be ripened in his controlled climate store at Victoria Market: there were crates and boxes to be moved constantly and, in 1937, when Nancy was in her third year at Merton Hall, he had a massive heart attack. Hardly anything was known about the treatment of heart disease back then and it was thought that his life expectancy was short. Nancy was given three choices: she could stay on at school, take a business course, or stay home to help her mother. The writing was on the wall. What everybody really meant was – take a business course: after all, Flo and Liz had been there before Nancy.

To Nancy's credit, she battled with the typewriter until she had the quick brown fox jumping over the lazy dog in time to the music on the crank-up gramophone and she did her best, indeed, she even succeeded, in being interested in short-hand – but more as an idea than as an outlet for her talents. Thus armed, she was offered work as a book-keeper for a customs agent, where, as she put it, 'I was the lowest thing there was.'

Meanwhile, Jean had applied for a British Commonwealth Scholarship to London – there was one given for the whole of Australia, and, in 1939, she won it. Her father, whose health was improving, bought twenty-five copies of the paper it was announced in and handed them out to all and sundry, saying 'my daughter, you'll notice. This one here – my girl.' She had reached Ceylon on her way to England to begin her PhD at London when the boat was turned back because of the declaration of war and it would be several years before she could take up the scholarship.

Back at home, she could see the suffering going on in her book-keeping sister's face whose chin was

more and more its forward-most point – and she noticed an advertisement for a female technician at the CSIR. The Division of Forest Products wanted a lass who would climb up on a table and then onto another table and then would sling herself over a cross beam and align her good eye through a telescope with a ruler that measured the deflection of different types of connecting rod (for aeroplanes) that were thirty feet in length and hung 'from a little bit that went up like a cathedral spire' and to which pressure would be applied by someone, probably male, who knew how to apply pressure. At least Nancy would be combining her athletic prowess with a vocation of sorts. And she'd begun her Leaving/Matric at night school.

Meanwhile, Frank Millis's health was improving against the odds, Nancy matriculated in 1940 and was able to go to university in 1941 – but not, as she'd hoped, into Science. The Faculty of Science had a requirement for a single year matric: there seems to me to be no other reason for this than to exclude people from disadvantaged backgrounds. Coming, as I did, from the much younger campus of ANU, I was amazed by the conservativeness of Melbourne as late as 1972 where the major colleges were still for men only and female students waited on them at meal times. To give an example of the attitudes as far as Nancy was concerned, I remember her exploding in the tea room on one occasion when she received an invitation from the Staff and Distaff Association to 'Doctor Millis *and wife!*' We all laughed, but there was a double edge to our laughter, because we knew why she was angry.

Back in 1941, Jean pointed out to Nancy that the Faculty of Agriculture took students with a two-year matric and that in first year, some of the subjects were



Fig. 7. Fruit picking in her first university vacation.



Fig. 8. Horses at Dookie.



Fig. 9. L-R Maisie Fawcett, G. Honey, Nancy, Prof Turner.

the same as in Science. She could start in Agriculture and move over into Science if she wanted to.

Nancy took to the Professor of Agriculture straight away. He was Sam Wadham and he used to run an ABC radio program on Sundays to which everyone listened – for the first time, Australians started to hear about the dry backblocks of their country, why the soldier settlements after the Great War had failed, and what must be done after the Second War with land reconstruction. Farms weren't just land grants, they had to be viable and water supply was a major consideration. By the end of her first year, Nancy had no wish whatever to be a biochemist, from the time she put on the gum boots, she was a converted aggie (Fig. 7). The second year she spent at Dookie Agricultural College and came to love doing the rounds that involved riding a horse (Fig. 8). But not only was she interested in the exploitation of the land for farming, Nancy was an environmentalist as well. During her long vacations, she and several other students interested in botany and soil, would go up to the Bogong High Plains to help Maisie Fawcett of the Botany School in her study of the impact of cattle and sheep grazing on proposed and already extant water catchments up there. This work was funded by the Victorian Soil Conservation Board and Maisie Fawcett, who incidentally was a Footscray High School girl and came via teaching to university, was the wartime substitute for the 'suitable man' the board wished to employ (Fig. 9).

Maisie Fawcett's headquarters were in a scout hut near the State Electricity township of Bogong. She had fenced off exclosures which kept out livestock and rabbits and her work teams would go

around, both inside and outside the exclosures, with standardised upright frames doing random counts and recording the plant varieties whose leaves touched the frame wires. Although ecological studies were regarded as very esoteric in the 1940s, Maisie Fawcett's work resulted in the exclusion of sheep from the high country and the restriction of cattle and timing of cattle grazing, but as Nancy pointed out, it was not for another sixty years that cattle were excluded altogether from the region and people are still fighting to get them back there. Nancy herself was intrigued by the ecology of the mosses in the area and these studies spurred her on to become an advocate for pristine water catchments and to involve herself in the politics and practicalities of water use in a land with severe water problems.

By the time Nancy was in her third year at university, her father was back working in the store and doing heavy work because his sons had gone off to the war. His second son, Frank Jnr, was taken prisoner at El Alamein and it took some time before the Red Cross managed to get news through that he was alive. The effort and stress of all this culminated in another massive heart attack that killed him outright, while he was playing bowls. Nancy, however, went on to graduate in 1945 – the 24th woman ever to be awarded the B. Agr. Sci. at Melbourne. There were two other women in her year, one of whom took the exhibition.

Statistics show that during the war the proportion of married women began to rise in Australia and there was a higher proportion of families having their first child at the end of the war than at any other time in Australia's history. Though single women were respected in Nancy's family, and she alone of the women graduating would continue on to become a fulltime career scientist, the public rhetoric from Menzies in 1940 to Arthur Calwell, Minister for Immigration in the Chifley cabinets that spanned the end of the war, was pressuring Australians to 'populate or perish'. Nancy was neither tempted nor intimidated; she had different choices. She could rejoin the CSIR on a project to check the purity and viability of seeds, or take up an A M White Trust scholarship to do her masters degree. The seed alternative looked boring, so she took the scholarship and completed her masters over 1946 and 1947. In 1948, she joined the State Department of Agriculture and Fisheries.

Nancy and another young woman were chosen to go to New Guinea with the aim of learning the agricultural practices of the women there – it was the

women who grew all the village crops. There was a short course for field officers run by the Commonwealth Public Service before she went, and while it was interesting, it was irrelevant. There was no English spoken in New Guinea and Nancy was expected to make contact with the women with no grounding in Pidgin at all. Off the two women went to Port Moresby (Fig. 10), where they were to stay for the better part of a year while public servants on sinecure did nothing much to get them into the field among the women. Nancy spent most of the time tidying up the few books in the departmental library and classifying plants. When at last it seemed that the boat to take them to Fly River was ready to go, Nancy fell ill with an acute gastric problem, quite possibly a ruptured appendix, and she became extremely ill extremely fast. Despite the efforts of a surgeon who was with a petroleum exploration company and an anaesthetist, who was the vet's wife, by the time Jean arrived in response to an urgent wire, one of Nancy's lungs had collapsed, her organs were failing and she was Cheyne-Stoking. She believes her life was saved by a course of streptomycin, a very new drug at the time, which was sent up from the Commonwealth Serum Laboratories in Melbourne.

The flight back to Australia was a nightmare: firstly, the ambulance that was meant to take Nancy to the plane went to the wrong hospital and while the plane waited for them, they missed their through connections and had to get permission to fly at low altitude so that Nancy could breathe enough oxygen, because there were no reserves on board. There was a stopover in Brisbane, and then in Sydney, emergency hospital accommodation had to be found; meanwhile, Nancy had become oedematous: her feet grew enormous and her fingers swelled to the size

of bananas, but she was so busy fighting for her life that she didn't stop to consider how ill she was. During her hospitalisation in Melbourne, her fingernails stopped growing and her hair fell out, but she lived to go home to a grateful family with no long-term ill effects except a little damage to her kidneys as a result of processing such a huge load of bacteria.

Her convalescence was long; she spent several months just getting well and she decided that she was going to apply to do a PhD abroad, because, again, there was no PhD stream at Melbourne. In the winter of 1949, she wrote off an application for a Boots scholarship to the Long Ashton Agricultural Field Station of Bristol University (Fig. 11), and, with just enough money to get home if the scholarship didn't come through, she hopped into the blunt end of the *Largs Bay* with a group of mates and sailed into the summer on the other side of the world.

In England she had a great time sleeping on floors at Cambridge and Rothamsted before the Boots interview and, when the scholarship came through, she moved to Bristol, where she was offered three topics to choose from: strawberry little leaf, gleying in Scottish soils and spoilage in cider. She didn't have to spend much time gleying in the marsh over these choices because spoilage in cider had all kinds of side attractions, not the least of which was developing a palate for the brew in the heart of cider country. Although her supervisor decamped half way through her degree, and the lab she was in was far from high tech, state-of-the-art, Nancy graduated in 1952 and sailed home as Dr Millis to see what the possibilities were for gainful employment in Melbourne.

It appears she was too well qualified for Melbourne: Carlton and United Breweries turned her down, and so did Kraft. It was suggested that she go



Fig. 10. Port Moresby, 1948.



Fig. 11. Entrance to Long Ashton.

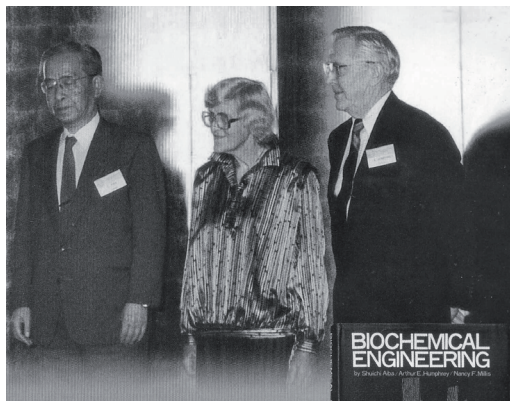


Fig. 12. Nancy Millis with Suichi Aiba and Arthur Humphrey.

to the Waite Institute in Adelaide, but Nancy wanted to stay in Melbourne. It was then that Professor Syd Rubbo of this department (the Department of Microbiology) offered her a place as a Senior Demonstrator, and the following year promoted her to Lecturer.

Rubbo was a progressive and realised that he had a talented and energetic teacher on his hands and the makings of one of those rare beings, the founder of a new stream of research. He granted her an early sabbatical and encouraged her to take up a scholarship offered by the American Association of University Women in Madison, Wisconsin, where Marvin J Johnson was making use of the knowledge gained from the fermentation of penicillin during the war by studying mass transfer, oxygen transfer and the slow feeding of organisms. This was the foundation of Nancy's career, which she – female, fair-haired and English speaking – later took further by studying

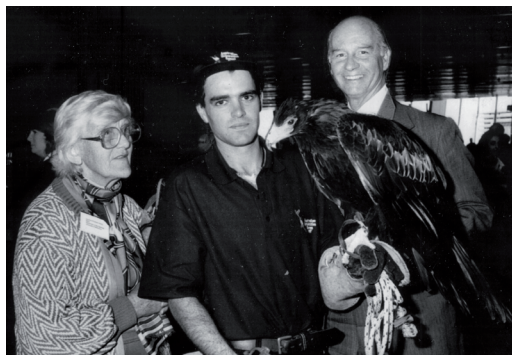


Fig. 13. Nancy saying no to La Trobe's mascot, a wedge tailed eagle.

continuous culture with Suichi Aiba at the University of Tokyo. There, she met Arthur Humphrey, an American who came on a Fullbright Scholarship, and between them Millis, Aiba and Humphrey devised a series of lectures and co-wrote *Biochemical Engineering* which became the standard textbook in Australia and was translated into several other languages (Fig. 12).

In 1982 she was only the fourth woman ever to be appointed professor at Melbourne and she told *The Age* that universities could be

'A bit of a club where blokes tend to appoint blokes...And there is a tendency for women not to want to take on responsibility but that's partly because sometimes they are invited to take responsibility in such a way that they can't say yes.' (Fig. 13.)

I thank you.