THE HOUSE THAT SYD BUILT: AN EARLY HISTORY OF THE DEPARTMENT OF MICROBIOLOGY

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The Department of Microbiology and Immunology, University of Melbourne, where Prof. Nancy Millis spent most of her professional life, has been influenced by many key figures, not least Prof. Millis herself and the long-serving chair of the Department, Prof. Sydney Rubbo. This is the story of some of the people who have inhabited that Department.

Key words: Rubbo, women in science, industrial microbiology.

The Department of Microbiology is about to take a grand leap across Grattan Street to become the Peter Doherty Institute. Jim McCluskey will be telling you about those future plans. My task is to talk about our beginnings in Swanston Street as the old Bacteriology School to our present building in Royal Parade. In presenting an idiosyncratic History of the Department, I want to paint a picture of the people as well as buildings, because people are no less important than the building. Indeed, they *are* the Department. Of course I will use the opportunity to talk about Nancy and her formative role in the Department.

Syd, of course, was Prof. Sydney Datillo Rubbo. He was not the founding professor – that was Harold Woodruff – but he, perhaps more than any other, set the tone for the Department. He is remembered by many with great affection.

So what sort of man was he? One of the first things anyone noticed about Syd was his striking looks. At the time of his appointment, Raymond Priestly, then Vice Chancellor, described him as 'a handsome man in the Mediterranean manner'!

I remember him very much as in this picture (Fig. 1), with a shock of white hair contrasting with his Italian olive skin. He was very conscious of his good looks, and he used some sort of whitening agent on his hair. To the huge amusement of us students, it glowed blue under the fluorescent lights of the lecture theatre!

Syd Rubbo graduated in Pharmacy from Sydney in 1934. He spent 1935 at the School of Hygiene and Tropical Medicine in London gaining a Diploma in Microbiology. What he learnt there influenced greatly his later teaching of Microbiology at Melbourne, and also inspired him to decorate the outside of the building with the names of famous microbiologists, Pasteur, Koch and Lister, as appeared at the London School. He then won a PhD scholarship at University of London studying the fungi of blue-veined cheese.

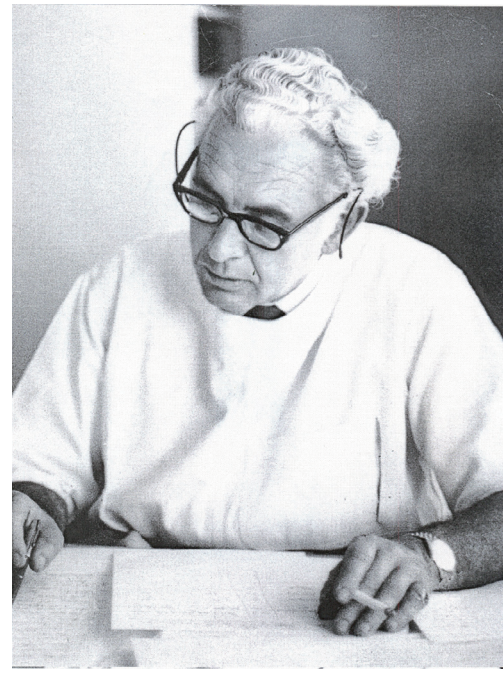

Fig. 1. Professor Sydney Datillo Rubbo at his desk in the 1960s.

Fig. 2. The Bacteriology School, Swanston Street, 1945.

He joined the Department in 1938 as Senior Lecturer. There he undertook still further study, pursuing a part-time degree in Medicine, while simultaneously lecturing to his fellow students. He ultimately topped his final year in 1943. In 1945 he succeeded Woodruff as Chairman of Bacteriology. This is the Department he took over (Fig. 2). You may now know the building as the Ian Potter Museum of Art on Swanston St.

I often think it is fitting that our old home is now an Art Gallery. Syd's father, Antonio Datillo Rubbo, was a painter whose work hangs in the Art Gallery of New South Wales and who ran an influential school of art in Sydney. Syd continued his artistic interests and also his Italian heritage. He was an active member of the Dante Alighieri Society and was made Cavaliere for his services to Italian culture in Australia (Fig. 3).

Syd was an arts patron rather than practitioner, and we were surrounded by works of current artists around the Department. Many are now lost, but some remain. Fig. 4 is chosen both for the artwork still in our library and also to illustrate another aspect of Syd's character. Hazel Jenkin was the mother of one of our graduate students, Heather. In the space of six months, Hazel lost Heather, her only child, plus the grandchild she was carrying, and then her husband. Syd saw this tragedy and a little later suggested to Hazel that she might care for the small collection of books that passed for our library. It would give Hazel an interest and help the Department at the same time. She took on the job, became our Honorary Librarian and ultimately endowed the library very generously in memory of Heather. Thus when we moved to our current building we had a library that was the envy of other departments and remained independent of the University system for many years.

Syd was genuinely caring of people, and somehow it usually turned out well for the Department! He had a great ability to gather people around him, including an outstanding Microbiology staff. The staff of the early 60s reads like a Who's Who of Australian Microbiology:

- Prof. Syd Rubbo.
- Prof. Frank Gibson, later foundation Professor of Biochemistry at ANU.
- Guest Prof. Sir Macfarlane Burnet, retired Nobel Prize winner.
- Assoc. Prof. David Gray, later Professor of Microbiology at Austin Hospital.
- Readers:
  - -Geoff Cooper, later foundation Professor of Microbiology at UNSW.
  - -Bruce Holloway, later foundation Professor of Genetics at Monash University.
  - -David White, later Chair of Microbiology, The University of Melbourne.
- Senior Lecturers:
  - -Joan Gardner, Secretary and President of the Sterilisation and Disinfection Society of Victoria, conferred AO for her life-long services to hospital infection control.
  - -Nancy Millis, later awarded Personal Chair in Microbiology, The University of Melbourne.
  - - Rose Mushin, ultimately retired to Israel where she continued to contribute to the microbiology of pseudomonads.
- Lecturers:
  - -Ian Holmes, later Reader, co-discoverer of rota virus as major cause of infantile gastroenteritis.
  - - Jim Pittard, later Chair of Microbiology, The University of Melbourne.

Syd was supportive of women as scientists. When I arrived in the Department as an undergraduate in 1962, we were a class of 20 women and two men who had never been lectured to by a woman. There were three remarkable women on the lecturing staff of Bacteriology:

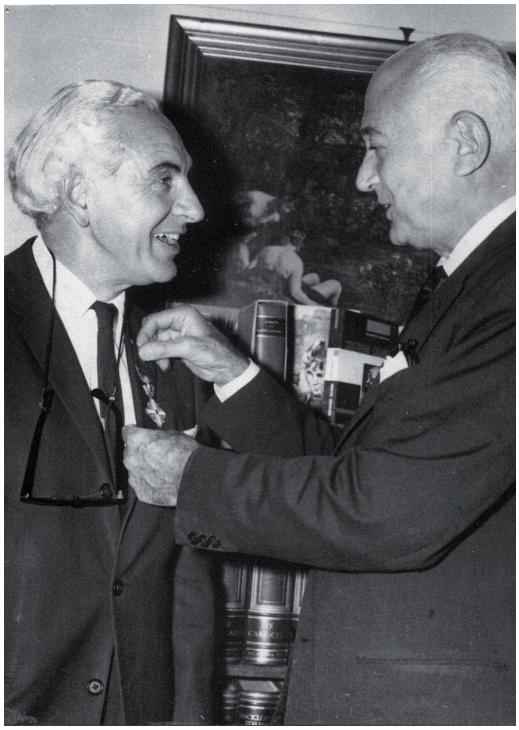

Fig. 3. The Italian Consul General, Dr. V. Strigari, awards the Cavaliere medal to Prof. Rubbo.

- Rose Mushin (Fig. 5A) lectured to Agricultural Science students. Her research interest was lipopolysaccharide of *E. coli* and *Vibrio*. She adored her Aggie boys and they adored her.
- Joan Gardner (Fig. 5B) taught us about fungi and about sterilisation and disinfection. Ultimately she had a seminal influence on practices around the hospitals of Melbourne.
- Nancy Millis' (Fig. 5C) interest was in fermentations and what was then called Industrial Microbiology. She was a superb lecturer, who could make even the disposal of sewage interesting to undergrads. I well remember her marching into the theatre and thumping down some battered or blown can of fruit or meat and explaining the hazards of food spoilage in industrial processes. I also remember her practical classes, where the most popular exercise was the making of mead. Imagine the reaction of Occupational Health and Safety these days!

Rubbo's own research interests were eclectic. Starting with the fungi of blue veined cheese, he moved to chemotherapy of tuberculosis, to immunisation against tetanus and then to hospital infection. He and Joan Gardner collaborated on an influential textbook on hospital sterilisation and disinfection. At one stage he even acted as a consultant on the sterilisation of returning spacecraft. He used his microbiological standing to campaign against biological warfare. I think it is fair to say he was not an outstanding researcher. His mind ranged too wide and too free. But, as you would expect of a man of such charm, he was a brilliant lecturer, and as a visionary he was outstanding. His support of other researchers was vital to *their* outstanding contributions.

Syd ran the department as one big family. Academics and senior graduate students attended a "wine in" every Friday evening, which was intended to promote communication. Christmas parties were held at Syd's home in Ivanhoe and included all staff from professorial to wash-up ladies (Fig. 6). Of course at

Fig. 4. Mrs Hazel Jenkin (later Lady Burnet), honorary librarian, in the Heather Jenkin Library, which she endowed.

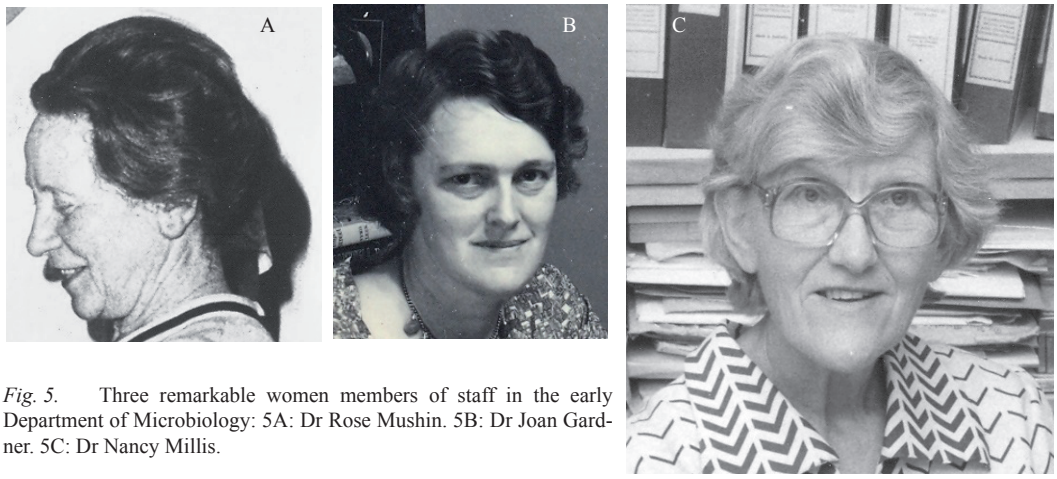

Fig. 5. Three remarkable women members of staff in the early Department of Microbiology: 5A: Dr Rose Mushin. 5B: Dr Joan Gardner. 5C: Dr Nancy Millis.

that time, the total staff was about 50, compared with more than 250 today.

Notwithstanding the quality of staff, the building itself was a disaster. Frank Gibson's lab was one of the better ones (Fig. 7). (Note the formula for chorismic acid on the board, Gibson's key discovery and central to his research.)

David White and Ian Holmes shared a small broom cupboard off the practical class labs and retired there when a prac was in progress. Later they would emerge to carry out their work in the classroom.

Nancy, Rose and Joan were down in the basement. My most vivid memory is of the ivy that grew in through the windows and across the ceiling. So much for aseptic technique! However, their most pressing problem was the frequent floods. This became so bad that, to make a point, Nancy took to wearing gumboots to work.

They shared the basement with some of the wonderful characters of the day, the sort of people whose pictures don't survive in the archives but survive vividly in our memories.

There was Flo, the cleaning lady, who was about 6 ft tall and doted on Prof. Her kingdom was literally below the stairs, in another cupboard room where she had her own cane lounge! She also kept there her industrial-size polishing machine, which she would wield with gusto to sweep anyone but Prof. off their feet. All the while, Flo sang hymns in a hearty voice.

David Robotham ruled the media room with what one might politely describe as "robust" language. He later became an Anglican Minister and ended up Dean of Perth. Perhaps it was Flo's hymns.

Charlie Chapel was the "messenger boy", in his 60s. As undergraduates we initially assumed he was the professor because he was always dapper in a three-piece suit with trilby hat. He combined his deliveries with visits to his SP bookie and was generous with tips at Melbourne Cup time.

Enid Merrifield was chief bacteriologist at the Diagnostic Unit and a redoubtable lady. She was reputed to be able to smell a case of diphtheria as soon as she opened the incubator in the morning. Once she had confirmed this by microscopy she could give the clinician very early, if tentative, warning of a case. Our current museum teaching area is named after her.

Fig. 6. Staff Christmas party at Prof. Rubbo's home. Left to right: Michael Wilson (Head of Microbiological Diagnostic Unit), Sybil Wilson his PA, Kiffy and Ellen Rubbo (Syd's daughter and wife), Syd, Joan Schiavone, Rose Mushin and Joan Gardner, all members of staff.

Fig. 7. One of the (better) laboratories in the old School of Bacteriology, Prof Frank Gibson on left.

Frank Anderson ran the machine shop. He could repair anything or make anything for you. When I retired I kept some of the small equipment he had made for me as being too exquisite to throw out.

The basement led to the Animal House, where I spent my Honours year studying tuberculosis. There were no safety facilities then, apart from a yearly chest X-ray, a great case of shutting the door after the horse (or in my case mouse) had bolted. Animal attendants were labourers, not skilled technicians, and the animal house itself reflected this low priority.

Anyway, it was clear that the Department needed a new building. Syd started a campaign which involved releasing rather contradictory stories about how good we were at science but how outdated were our facilities. The pictures he used to illustrate his point (Fig. 8) were a bit disingenuous, since I suspect the equipment was already out of use.

Ultimately he obtained a commitment for $500,000 and planning began, with Romberg and Boyd as the architects and Roy Grounds doing the plans. Before plans were complete, Syd went to New York on sabbatical. He maintained overall control of the building project by sending back audiotapes and his own sketch plans. He was scathing about the original architectural plans and the faded transcript of his tape often makes amusing reading. However, his ideas were visionary.

The lecture theatre should be broad, he said, to give the audience contact with the speaker, not long and narrow with the audience remote. He described the initial architect's drawing as a "prize piece of bad planning" because latecomers had to enter in front of the speaker. The lecture theatres were to serve not only undergraduate lectures, but also meetings of learned societies, and as such they needed access from outside and to be able to be locked off from the

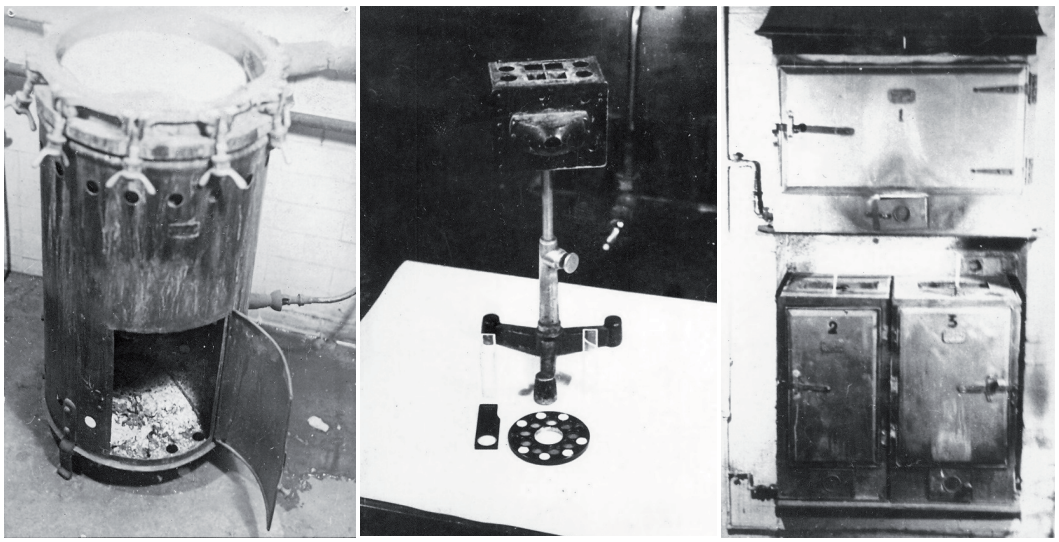

Fig. 8. Outmoded equipment from the 1950s to 1960s. 8A: Gas-fired autoclave. 8B: Helige comparator pH meter. 8C: Gas-heated hot air ovens.

rest of the building for evening lectures. They were to communicate with a large tearoom, which would serve such meetings and allow staff to mingle together as well as with undergraduates. The fact that the whole was suitable for our continued enjoyment of expansive Christmas parties I am convinced was part of his secret agenda!

I don't want to imply that life was one long party, but that Syd laid strong emphasis on social contact as a means of promoting scientific interaction. He grouped the laboratories of people with similar interests to promote communication. Graduate students were to have their own meeting room.

Corridors were to be wide and straight, no zigzags as in the initial architect's plans – "no corners, no collisions" he said. Judging by the transcript it was Syd's idea to separate labs by glass partitions, which gives the building its wonderful open feeling, without sound echoing all around (Fig. 9). The strong horizontal lines of the building were also his concept. He foresaw the need for expansion and allowed room for a whole extra wing. Close to my heart, there was a large animal house.

He ends by describing the architect's initial layout as "the muddiest bit of planning I have ever seen". He says he has written to the Vice Chancellor, who cabled him saying if displeased he should return immediately. However he claims that is not possible because he is on the verge of a major discovery! He then goes on to invite Roy Grounds, whom he had just thoroughly insulted, to visit him in New York to discuss the plans, assuring him of an exciting time while there!

Somehow they overcame their differences and the plan must have been a compromise. Syd's time in New York was probably very useful, because he cites many ideas for the building sourced from what he saw in New York. Syd didn't get all his druthers, and the final building differs from his sketch, but it does incorporate much of his spirit.

Figure 10 shows the official Program for the Opening Day. I know brutalist architecture is not everyone's cup of tea, but there is a real grace to this building, and it was considered a fine example. It is a pity we lost it by extending the Diagnostic Unit below.

The cost of the building was approximately $850,000. Inside, the program lists numbers of staff, students, courses, publications, and the facilities of the building. It particularly mentions a "large scale laboratory for pilot manufacture of antibiotics and bacterial cultures." This was Nancy Millis' fermentation laboratory. We were very proud of that high-tech installation.

The building was thought out to the smallest detail. We had modular furniture, which was raised from the floor for easy cleaning. We had cupboards with sloping tops that would not accumulate dust, and on opening day, women were expressly forbidden to wear spike heels, then in fashion, lest they press holes in the rubber flooring which would then accumulate BACTERIA! We were also forbidden to wear trousers to work – different from today's uniform of jeans!

Syd on Opening Day looked wonderfully pleased (Fig. 11).

Fig. 9. A practical class in the open-plan "new" building on Royal Parade, 1965. Jim Pittard is lecturing.

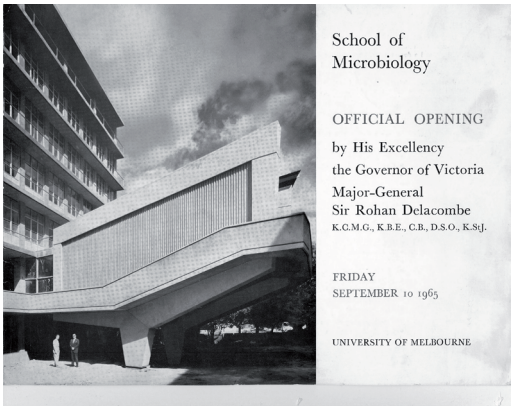

Fig. 10. Program for the opening of the "new" building on Royal Parade.

Fig. 11. Official Party on Opening Day. Left to right: Sir Rohan Delacombe (Governor of Victoria), Sir George Paton (Vice Chancellor of University of Melbourne), Mr Justice (later Sir Charles) Lowe (Chancellor of University of Melbourne), Aide-de-Camp, Prof. Sydney Rubbo.

I have tried to paint a picture of a multifaceted character, of great charm and charisma, who attracted people around him and could use those qualities to build a department, both a physical construction but more importantly a human construct. Sadly he only had five years to enjoy his achievement, dying in 1969 at the age of 58.

Thereafter the Chair alternated between David White and Jim Pittard, who did an extraordinary double act that is part of a later history.

What of Nancy, the inhabitant of that fermentation laboratory? Like Syd, her role in the department was also multifaceted. She was an outstanding lecturer, much loved by her students. She is a legend amongst Agricultural Scientists, having spent many years running their Microbiology course. In the Science course, she was a pioneer in teaching what was then called "Industrial Microbiology", now the vital field of Biotechnology. With Japanese and American collaborators, Shuichi Aiba and Arthur Humphrey, she co-wrote what is reputedly the world's first Biotechnology textbook. She and Jim Pittard became responsible for one of the three arms of Microbiology teaching that the Department was able to offer: Biotechnology, Medical Microbiology and Immunology, making it the most comprehensive degree available in Australia.

Nancy's research interests have been wide-ranging, beginning with a pioneering study (it is impossible to describe Nancy without continually using the word "pioneering") of denitrification, supervised by Vic Skerman in our Department of Bacteriology in 1948. This was followed in 1950-52 by a PhD at Bristol University on cider fermentation and spoilage. When she returned to Melbourne in 1952, her work focused on optimisation of bacterial metabolism to produce useful products like citric acid. Clearly that fermentation lab was put to good use here. Work on the breakdown of hydrocarbons led to an interest in what is now called bioremediation, using living organisms to rid the environment of undesirable chemicals. She studied such matters as pig diets, and the metabolism of hops, and streptococci in the rumen, and the bacteria in paper pulp. She undertook work on marine and faecal bacteria in Port Philip Bay, becoming an expert on water quality.

In other words there is no end to Nancy's curiosity or her ability to tackle any practical subject. This led her to being much in demand for advice to industry, and so to another pioneering role: she was reaching out to Industry long before the government and universities told us this was our duty. People in industry found her down to earth approach just what they needed, and I suspect she found them congenial compared with some of the constraints of academia. She gradually acquired such a breadth of experience that, together with a razor-sharp mind and an extraordinary memory, she became an absolutely invaluable resource.

Another role in the Department was to keep us all in line! She has an amazing ability to keep focused on the issue at hand, and keep everyone else focused. A fence was not a place where you would find Nancy sitting.

I can remember many staff meetings where we were starting to wander from the point when Nancy brought us all back to order, including the Head of Department! This ability probably explains her role on so many scientific and public service committees. As far as I can work out she has served on at least 42 major committees and chaired at least ten. This is probably an underestimate, because Nancy has simply given up keeping a CV. She doesn't need to apply for any jobs! We will hear from others her contributions in this respect, but the one I remember when she was still a member of staff was the work she did for UNESCO (Fig. 12).

I was always sorry Nancy never took a turn as Chair of our Department. Those were the halcyon days when we elected our own Chair, and some of us tried to persuade Nancy to take a turn. However she claimed the Medical Faculty was not yet ready for a woman Head of Department.

Fig. 12. Nancy Millis at a UNESCO workshop in Bandung, Indonesia. Nancy made a considerable contribution to UNESCO in the area of biotechnology.

Fig. 13. Never one to stand on dignity, Nancy, with Yifan Zhan, won the three-legged race at the staff picnic Christmas party in 1989. Brian Hodgson is referee.

Indeed it took some time before the University caught up with Nancy altogether. She was awarded a Readership in 1968 and ultimately a Personal Chair 1982. They did eventually catch up, giving her an honorary Doctorate of Science in 1992, five years after she retired.

Nancy was always a beacon to the women students and staff. In those days women scientists were not the norm and life was not always easy, but with Nancy around you learnt that it was not much good sitting around whingeing. You just got on with it.

However, to confine her to being a role model for women is to underestimate her contribution. She was an exemplary contributor to the Department, respected by men and women alike. She worked to the highest ethical standards. None of her success was at the expense of others. She could be relied upon for wise counsel. She always gave an honest, straightforward and unbiased opinion. Another nice characteristic of Nancy is that she has never taken herself too seriously – or perhaps she knows when to be serious and when not. Figure 13 shows one of her less serious moments.

Nancy has been showered with awards: MBE, AC, a number of named lectures and scholarships. There is one compliment I think she secretly rather favours. She has an entire genus of bacteria named for her: *Millisia*, which cause foaming in waste-water treatment plants!

Perhaps the most public honour was to be named one of the "Australian Legends" on our stamps, together with Peter Doherty, Gus Nossal, Don Metcalf and Fiona Stanley. It was the first time living persons had been depicted on our stamps (Fig.14).

So, Nancy, you will forever be that beacon for women, and for men too. You have the stamp of approval from us all.

Fig. 14. Launch of the Nancy Millis Living Legend stamp.