Contents

ORAL HISTORY IN NEW ZEALAND
VOL. 27, 2015

Oral History in New Zealand is an annual publication of the National Oral History Association of New Zealand, Te Kete Korero-a-Waha o Te Motu (NOHANZ).

NOHANZ also publishes a newsletter three times a year. Its editors welcome news, letters, notes on sources, articles or reviews relevant to the principles and practice of oral history.

Subscription rate (individual or group) is $40 (unwaged $25), which covers newsletters and the journal. The address for all correspondence and subscriptions is:

Secretary
NOHANZ
PO Box 3819
WELLINGTON 6140

www.oralhistory.org.nz

NOHANZ

ISSN 0113-5376

Editor: Megan Hutching

Cover design & journal layout: Jenn Falconer

Editorial

In this year's journal we are publishing a number of reports on projects which have received funding from the New Zealand Oral History Awards.

Shona McCahon reflects on a very interesting aspect of oral history interviewing – why do people agree to be interviewed for projects? This is something which would benefit from further thought and discussion perhaps at a conference or regional meeting.

Jeanette Thomas and Kathryn Masters write about the Mercer Museum oral history project. This project was commissioned by a small museum which has a great deal of community support, and which encourages people to share their memories of Mercer when they visit. Jeanette and Kathryn decided that a range of different types of interview would suit their museum best. This, again, is something that might be useful to consider when planning our projects.

Marina Fontein has been interviewing people of Lebanese descent in the Wellington area and has found, as oral historians so often do, that her interviews have helped her come to understand her heritage more fully.

Our refereed article this year is by Janet Toland and Jim Whitman and discusses an interview project with pioneers of computing in this country. It is a fascinating area of our recent technological history, and one which lends itself to interviewing rather well.

As always, we note recently published books which have used interview material or are based on oral history projects.

We welcome contributions to future issues of the journal.

MEGAN HUTCHING

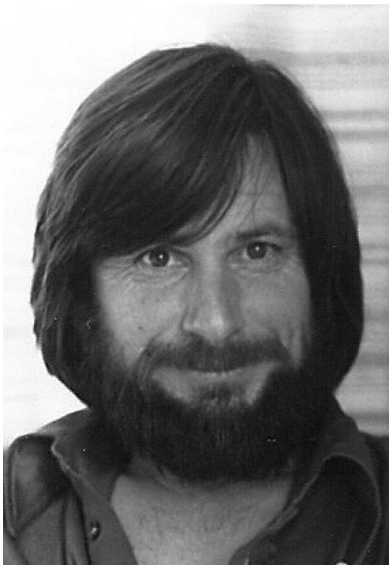
Oral History in New Zealand, vol.28, 2016

We welcome contributions, whether long or short articles, book, documentary or exhibition reviews, reports of meetings or conferences, or work in progress. Long articles are anonymously peer-reviewed.

The deadline for contributions to the 2016 issue of the journal is 30 June. A Guide for Contributors is available from the editor and on the NOHANZ website. Please send your contributions to the editor below.

If you are interested in becoming a peer reviewer for the long articles, please contact the editor.

Megan Hutching
hutching28@gmail.com



Frank March in 1980

Jim Higgins in 1990

Liz Eastwood in 1980. Photographs: Janet Toland

Wellington's Computing Pioneers 1960 to 2010

Reinventing the wheel? There was no wheel!

Janet Toland and Jim Whitman

Introduction

The original motivation for this project was sparked by the 50th anniversary of the New Zealand Computer Society in 2010, which was a reminder that computing now had a significant history in Aotearoa.[1] We felt we could make a significant addition to that history by collecting the voices of individuals who had been active in the New Zealand computing world for a significant proportion of that period. We wanted to let them tell their stories using the oral history methodology. Over the two years following the anniversary, eight oral histories were collected from pioneers of computing based mainly in the Wellington region.[2] This article presents their stories.

The first computer brought to New Zealand was delivered to the Treasury in 1960, although the Computer Society actually began its work six months before that.[3] As time went on, the early bulky mainframe machines used mainly by public sector organisations became smaller and more widespread, until by 2010 computers were practically ubiquitous. They spread from the workplace to the home, and today's young people are regarded as 'Digital Natives' who confidently navigate their own way around a wide range of computing technologies.[4] The people we interviewed have lived through these changes and we asked them for their personal stories about their involvement in computing, and for their wider reflections on how information technology has changed the society we live in.

Our eight interviews are part of a growing historical collection. Twelve oral histories were deposited in the National Library following the 25th anniversary of the Computer Society, and two books were published to mark the 25th and 50th anniversaries respectively.[5]

Researching and creating the oral histories

Computer Society members have made a significant contribution to computing in New Zealand. Our oral histories were collected in the Wellington region, where computing was first introduced to New Zealand. A panel consisting of the two interviewers and two senior members of the Computer Society selected potential interviewees working in a range of different sectors: tertiary and secondary education, public and private sectors, and both small and large computer systems. We looked for people well-regarded within the region and prioritised those whose stories had not already been collected, mostly excluding people who had already been interviewed in 1985 or who had contributed a chapter to the two books. Selection was not limited to Computer Society members, but most interviewees had some connection with the society. As computing is a notoriously male dominated profession, we also made sure we included two women in our eight interviews.

All interviewees were of Pakeha ethnicity. Most had university education – two to PhD level. Four were born in New Zealand, four were immigrants, and all had spent time overseas. The participants had been involved with computers for most of their working lives, though for one

Janet Toland is a Senior Lecturer in Information Systems at Victoria University of Wellington. Her PhD research, completed in 2010, analysed the historical contribution of IT to regional development in New Zealand over a 20 year period from 1985 to 2005. Together with Jim Whitman she has been collecting oral histories of individuals working in the IT industry in Wellington.

Jim Whitman got his first computer when studying for a Diploma in Social Work. Despite the machine-nature of study and work, he discovered that people and history were still at the centre of everything that we do. The oral history of computing in New Zealand has not disabused him of this belief. He has an MSc in Information and Records Management and a degree in Social Studies.

of the female interviewees, education was her primary focus. All participants, apart from one, were over 50.

The recordings adhered to the ethical standards of both the National Oral History Association of New Zealand and Victoria University of Wellington. The interviewing team consisted of the two authors, and together we developed an interview guideline (included as an appendix to this article) that allowed each interviewee to tell their own original story. Interview recordings were abstracted according to the National Library's guidelines and from there we identified common themes and unique insights. Context was provided by previous oral history interviews and the two books published by the Computer Society. Other materials were also utilised, such as Keith Newman's timeline of telecommunications history.[6]

Several common themes emerged from the interviews. When the interviewees were starting their working lives, computing was in its infancy, and the participants discussed what attracted them to work in such a new area, and the fun and excitement they experienced that made them stay with it. A lot of their enjoyment was derived from the fact that they were working in a highly innovative area, and many interviewees took a leading role in setting up new technologies and projects. A particularly significant development in Wellington was when CityLink became the first city-wide broadband network in the world, and the interviewees reflect on both the setting up and the ongoing effects of CityLink.

Computing is dominated by men, and the role of gender is briefly explored. One striking characteristic of all participants was their role as leaders, both within and outside their own organisations. Some leadership occurred within the context of the New Zealand Computer Society, but often extended far beyond it. The interviewees were asked what they thought was the most significant development in computing in their lifetime, and all agreed that it was the Internet. Their thoughts on how the Internet has changed the fundamental nature of computing form the final section.

First impressions

Many of the interviewees came to computing from a mathematics, science or engineering background. Professor John Hine recalls.

> *I went to a university called Union College which was founded in 1825 in Schenectady [USA], I did electrical engineering and in my third year there, they got their first computer, an old IBM 1620 and that's where I learned to basically stay up all night trying to get programs to work.* [7]

Others fell into computing by chance. At the age of around 17 Jim Higgins felt he just happened to be in the right place at the right time, as he tells it:

> *I went to work for the Palmerston North City Council when I left school and had a number of jobs in the office, and eventually ended up running a fleet of accounting machines, which were enormous great clanking contraptions, and from there really it was just a natural into IT [...] it's almost a classic 'right place at the right time' really. We just had so many problems trying to get the accounting work done that we were sort of forced into looking at something else, and that's how I got into it.* [8]

Now in his sixties, Andy Linton remembers the first time he saw a computer, though it didn't make much of an immediate impression on him:

> *I can remember vaguely when I was at school [...] we went to Queens University in Belfast [Ireland] and we saw THE computer, and it was a great big box, and there was memory that was made by threading copper wires through graphite cores, and it was just a strange world and it certainly wasn't something that was an everyday thing and I don't think I thought very much about it at the time or for a very long time afterwards.* [9]

For a young Nat Torkington, however, a trip to Auckland to see his first personal computer had a lasting impact.

> *I remember going to Whitcoulls with Dad, back when a trip to Auckland [from Leigh] was a big deal [...] big deal to go down to Whitcoulls on the main street, in Queen Street, head in there, on the upper level and they've got a display of different types of computers. There wasn't just a PC [personal computer], there were heaps of different varieties back then. So there were people with their BBC micros and their ZX81s and their Commodore 64s and stuff, and while Dad was looking around, I was looking at the computers. Some older man said, 'Ah, interested in this, here watch this,' and he went 10 PRINT HELLO. He said, "What's your name"? Nathan. Hello Nathan 20 GOTO 10. Prrrrrrr up it goes up the screen, I thought far out [...]. Dad had seen the way I reacted to that and thought, Hmmmm there's something in that. So went and asked my Uncle [Jeff]. 'I think the boy's interested in that stuff and could have a future in it, what would you recommend?' So Jeff picked the Commodore 64 and that was my poison.* [10]

Whatever their pathway into computing, many interviewees mentioned the job satisfaction and interest that kept them working in the area.

Jim Higgins explained why he likes designing computer systems: 'Starting with a problem, and having to come up with a solution to that problem that will work and actually benefit someone, and that's the challenge I like'. In contrast to the rather dry image that computing has in the mind of the general public, Liz Eastwood, Jim Higgins and Frank March all talked about the fun they had in the early stages of their career. Reminiscing about her first job in computing at International Computers Limited in London, Liz Eastwood comments:

> *I look back on that time, and I think I was incredibly lucky to have walked straight into a brand new industry, it really was, in that respect, and I was given opportunities to work at the coalface in places like Swiss Bank Corporation, IPC Business Press, Marks and Spencer's, those were companies that were sticking their neck out, if you like, really just experimenting, putting their toe in the water to see what this new technology could offer them, and I embraced that. We used to work really long hours, but it was such fun, and that's what the IT industry was all about back then: it was absolutely fun.*[11]

As well as enjoying the work itself, Jim Higgins also appreciated the status that came with working in such a new area.

> *I did very much enjoy system design work, it was quite a lot of fun, and of course in those days, we were gods. There were so few people working in that area, that if we said, 'Oh yeah, we're in information technology,' people would go 'Wow', so that was sort of fun as well.*

Another aspect mentioned by interviewees was the excitement experienced in being on the edge of new developments. John Hine talks about the first time he realised the potential of email for New Zealand when on study leave at the University of Connecticut in 1982:

> *I remember sitting down the first day at the University of Connecticut, which would have been right after New Year's Day, and sending a colleague at the University of Illinois an email. Now we'd been sending emails around the Department at Vic [Victoria University of Wellington] but we had no, even national, connectivity really. We had a little bit of an experimental link between our Burroughs [mainframe computer] and the Burroughs at Massey and a few emails had gone over it but only between the people that were playing with the link. So anyways I sent Roy an email, and BOOM got a response back, more or less the way you'd expect today, within a minute or two, and we had a couple of quick emails. He was asking how we were, had we enjoyed the holidays [...] and right then the penny just sort of dropped, because in those days in New Zealand communications outside of New Zealand, well communications, was hard work [...]. Communicating with an overseas colleague, typically took three to four weeks [...] and at that point a real light bulb, in the sense that this is going to change the way New Zealand operates, it can actually make us be part of the rest of the world.*

John Hine had seen the light and was one of New Zealand's first proponents for the Internet and its first 'killer application', email. He undoubtedly was 'can do', but as we hear later, not everybody was an instant convert.

Innovation

Interviewees talked about New Zealanders having a pioneering spirit, and the attitude of not being afraid to try something new. As Jim Higgins pointed out, 'There wasn't anyone around to tell us we couldn't do something, so we didn't know that we couldn't build big systems on tiny machines so we built them anyway [...] people just made it work'. Originally from England, Liz Eastwood found this "can do" attitude refreshing and contrasted it with her experiences when she moved back to England for four and half years in the early 1990s, to work for the West Midlands Police:

> *It reminded me again that England has a class structure and New Zealand doesn't. I had two people working for me on that team, one of whom had been at British Leyland, and he liked to work within a set of parameters, and if you asked him to do something that was not in his job description, he would get extremely rebellious about that, and I was totally taken aback. New Zealand and their 'can do' attitude was what I was used to by then, and to find someone in England saying to me, 'No I can't do that, it's not in my job description' was another little eye-opener for me.*

Despite being a small country, computing in New Zealand was seen as competitive at a global level, and even world leading in some areas such as education and local government. Jim Higgins developed local government computer systems for Palmerston North Council, and during the early 1980s visited many local councils in the United States, concluding that, 'Most of them were no further ahead than us, and many were nowhere near as advanced as we were. So I think New Zealand Local Government has always been ahead of the game'. Marg McLeod pointed out that one of the reasons the New Zealand education system was quick to pick up on using computers in schools was because the whole

system had a history of innovation: 'We've [New Zealand] always been very innovative in the education space [...] the philosophies New Zealand has held around student-centred learning have been, I think, quite world leading [...] We are a highly creative nation in that space'. [12]

Frank March was working for the Department of Science and Industrial Research (DSIR) during the Muldoon era (1975-1984) when computing was heavily centralised. He was one of a group working to develop a network for DSIR scientists working all over the country, from Kaitaia to Bluff, who wanted access to the central computer in Wellington. The project connected teletypes using a system called Nodecode that was developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia.[13] Frank regards being part of the team that got this project to work as one of the major achievements of his working life, but finds the challenges they faced are not always appreciated by today's young computer scientists.

> *There were a team of about six of us working on this. About two weeks after I joined, the first successful string of characters was transmitted from the Cumberland computer centre [Wellington] to Gracefield DSIR. It was a wonderful day, and everybody went to the pub to celebrate, because this was a very, very significant breakthrough, but the interesting thing was just how pioneering this was, because it's very difficult for today's computer science students to understand. I was telling somebody about this, very proud of this story, and this young computer science punk, basically, said, 'Well, stupid bloody idiots reinventing the wheel.' Trouble was, there was no wheel to invent, at that time.*[14]

After John Hine returned from his study leave in the United States in 1983, he had been promoting the idea of networking. However, he found it hard to convince people of the benefits of this, even in the university.

> *I've had that light bulb moment, but you'd be surprised how hard it was to sell. All we were looking at initially was [...] just basically trying to get what was called the UUCP network, Unix to Unix Copy, which was a dialup network which sent email by doing a copy [of the file] from one Unix machine to another [...]. It took several years to sort of sell that [...] you could send somebody a one page letter, so to speak, one day and have the answer back when you came in the office the next morning, and we could do that for about 25 cents, in the mid-eighties [...] pretty similar I guess, to the cost of posting a letter, but of course the letter would have been lucky if it left Auckland by the next day, much less having your answer back. And this was a really hard sell [...] people just looked at you, 'Why would I want to do that?' It was actually '86, it took three years [to set up the UUCP network].*

Eventually, in 1989, working together with John Houlker from Waikato University, he succeeded in connecting New Zealand to the Internet.[15]

Andy Linton describes the shift in thinking from a centralised telecommunications network to a distributed internet that permitted everybody to 'join the game'. Eventually, as a result of this early innovation, the telecommunication companies began to realise that the internet protocol had business potential after they learnt that traffic over the Internet was increasing exponentially. Andy recalls:

> *I remember a point where there was a clear recognition that data was actually going to pass voice [...]. It was in the mid 90s when the data traffic on the networks started to exceed the voice traffic [...]. It began to sort of bite and make the telephone companies realise actually our market is going to be different [...]. You think about a voice conversation, you and I can have one conversation [...] and we can consume a certain amount of bandwidth. We don't need any more, as a human being I can't have six conversations going on [...] but with computer stuff you can be having many simultaneous connections, and that was the joy of the packet network [...]. When I came here [...] we tried to talk to Telecom about this and they went, 'yeah, yeah, yeah, very interesting, you know lads, but we're working on the real stuff here, you get on playing with your little toys' [...]. For me there were some interesting data points along the way when you could see telephone people going, 'Oh, wait a minute.'*

Much earlier, as people started to realise the potential of this new internet network, a range of innovative ideas came out, and the early 1990s was an exciting time for Wellington. Jim Higgins worked with Richard Naylor and Charles Bagnall at Wellington City Council to develop what was arguably the world's first publicly available city wide internet network, CityLink, together with CityNet, the first free-to-use Internet Service Provider (ISP).[16] As Jim comments, 'this has been just magic for Wellington'.

Much of the innovation which followed in Wellington was due to the presence of CityLink. Don Christie, from open source firm Catalyst,[17] explains how CityLink enabled a small software house to compete with major players:

> *One of the real enabling technologies for Catalyst was when the City Council formed CityLink and*

rolled fibre optic cable round the CBD [central business district] and was probably the first city in the world to do that, and we had no money, but we still paid for it, the princely sum of $8000 to get a connection up to the office we were in, which allowed us to suddenly compete with much bigger companies like Datacom or Telecom in terms of the service, the internet systems we could build and host.[18]

CityLink was also instrumental in setting up the Wellington Loop, a broadband network connecting Wellington secondary schools. Marg McLeod recalls, 'We [Wellington Girls College] were approached by CityLink [...] who said, "Let's see what we can do for education in this space. Do you want to form a partnership?"'

Leadership

All of our interviewees had held multiple leadership roles, which was unsurprising, as we set out to collect the stories of people highly regarded within the Wellington IT community. However the participants' contributions across numerous different organisations was impressive. As well as being leaders in their everyday work, all had taken on voluntary roles within the wider community. As well as leadership roles within the New Zealand Computer Society, many were involved with other organisations, such as InternetNZ, NZRise, New Zealand Open Source Society, and the Association of Local Government Information Management.[19]

Marg McLeod puts her leadership skills down to 'being the fourth of four children, and of being an only girl in a family of boys. In fact, my primary school teacher [...] said I was a born organiser, and that I showed leadership traits from the time that I was six'. All demonstrated forward thinking and strategic awareness. Frank March's first actions when he joined Victoria University in 1988 are a good example of this.

The first thing I did when I joined the Computing Services Group [...] was to organise a bit of a forward thinking, strategic planning series of workshops basically, and out of that developed this idea of what I called seamless integration from desktop to mainframe computing, so that you didn't know where your computing was actually being done any more, it didn't matter. You were just connected to the system, and then we set about setting that up.

Don Christie, drawing on his experience of the Open Source sector, stressed the importance of collaborative leadership. 'I've always been brought up to believe, and see, that you can achieve much more through forming alliances with people, than you can on your own'. Andy Linton reflected on how his leadership skills have changed with age and experience:

One of the advantages you get with age with that stuff [leadership], is that I've seen how that worked then, and I've seen how that cycle came round again and hopefully you can steer people into ideas. I used to get very nervous about people talking about having good policy and so on, but I actually think it's part of strategic thinking as well as tactical thinking. Maybe when you're younger you like to be the tactical stuff, the soldiers on the front line, and as you get older you might want to be a General, saying let's direct [...] but it is the bigger view and I hope there's still a bit of contribution to be made there.

As well as being a natural leader herself, Marg McLeod was keen to develop leadership skills in others. When working as Principal of Wellington Girls College, she set up the Tech Angels scheme, where school students with good IT skills helped their not-so-digitally-literate teachers. One of the outcomes of this project was the opportunity for the girls to build their leadership skills. 'It was another way for girls to show leadership, it was another way for them to give service'.

Gender

An ongoing issue in the computing sector is the under-representation of women.

Liz Eastwood recalls that, *'in the early days, to some extent I was a novelty [...]. I did find that because I specialised in data communications, that I was one in many. I do recall going to one particular conference, or several actually, networking events: I'd be one woman and there'd be 500 men'.*

This imbalance is an issue for science and technology generally and has been discussed by Lesley Hall in a previous issue of this journal.[20] In the early days of their careers, neither of our female participants found their gender a barrier to career progression. However, when the time came for them to start their families, life became more challenging. Liz Eastwood noted that:

I would say that in terms of my career progression, here in New Zealand, I found my 20s absolutely fine, no barriers, until I got towards the end of my 20s, and you'd apply for a job that was fairly senior, and discover that I was not chosen because there was a perception that I would probably be leaving to have children, and they actually did tell me that. Now, it wouldn't be tolerated in this day, but certainly back then you just accepted it, and carried on with life. I wasn't happy about it, but you just had to accept it.

Both Liz Eastwood and Marg McLeod kept working while they had their children, but it was not easy. Liz discovered,

> *'It is really, really tiring working from home because your life is 24 hours, 24 by 7, looking after everything you need at home, not just being a mother, but also looking after the house, and running a business at the same time'.*

Marg McLeod relied heavily on the assistance of her husband, who became chief caregiver at times.

Impact of the internet

To conclude the interviews, we asked our participants what they thought was the most significant change in computing during their career. There was unanimous agreement that it was the development of the Internet and the World Wide Web. In the opinion of Jim Higgins, 'The most significant change has got to be the net [Internet]. It would have to be. I think it's had more impact than pretty much everything else'.

Frank March was more specific in his comments, pointing out that the real impact was made by the World Wide Web rather than the Internet itself.

> *As far as New Zealand is concerned, it's more like twenty years old, the Internet, but the real revolution in terms of communication was, of course, the World Wide Web [...]. One day I put Mosaic up on my Macintosh computer [...] and lo and behold, a new world opened up, and the World Wide Web became hugely accessible in an instant, and it was at that point, that I realised myself, that the Internet was not going to be restricted to geeky people in universities or scientists as a communications tool. It was going to be critically important for everybody.*

Don Christie and Marg McLeod also stressed the way the Internet has changed the way we work by opening up possibilities for communication and collaboration. The open source movement is based on collaboration, and Don Christie comments, 'The big eye-opening event for those of us who like to collaborate is the advent of the Internet, the relationship between the Internet and open source software has been symbiotic.' For Marg McLeod working in education, 'The advent of the Internet has to be the most profound thing, the ability for people to collaborate, that move from communicating one-on-one to being able to communicate as part of a group, and to be able to collaborate as part of a group'.

However, Andy Linton pointed out that the Internet has negative as well as positive effects,

> *'There's certainly a sort of struggle for control, if you like, but then that's the nature of big social change I suppose, you know? How is it going to pan out? We may end up in the hands of a bunch of major multi-national corporations, or do we keep looking after our own destiny? I know where I'd like it to be. I'm not sure that's where it's going to end up. Who knows, you know?'*

He reflected on losing control of a technology that he had helped create, and questioned where it is going to end up in the future:

> *I remember, early in the piece, mid-nineties, one night, one of the guys I work with over in Australia and I were up working late, you know, working on stuff. He sort of went, 'Phew, damn this, you know. Why are we here at eleven o'clock at night? Just so people can look at porn, you know, and that's not what we built this thing for, and of course it's not ours. It's not ours anymore. It wasn't ours anymore even then [...]. You built this thing and so much of it could be used for positive stuff, and yet there's a bunch of negative nonsense on it.*

Conclusion

Our interviewees gave highly informative insights into their own unique, creative, and innovative work in computing. They have each made invaluable contributions to the history of computing in New Zealand. What had often started small, such as the setting up networks to carry everything from email to raw data, the use of the 'new' Internet to facilitate collaboration between teachers in schools, starting a small business to create open source software, or the use of computers in local government, has become a social and technological revolution, and big business.

Our interviewees were on frontiers that were both scientific and electromechanical, and on the frontiers of conventional human social communication. It is clear that although many recollections were about striving to create the technological means for networked computing, our interviewees also had to persuade people of the implications of these new technologies for jobs, organisations and for society in general. Institutions, both public and private, were often slow to follow and needed proof before they were ready to commit. Our interviewees show how they tackled both the technological challenges of setting up the infrastructure and demonstrating the value of these developments. Once a territory has been established, those that follow can easily fail to appreciate the determination of the pioneers who built the first outposts. That is one of the messages we hope has been an outcome of our oral history making.

Appendix: interview protocol

List of potential questions

The idea is that each oral history interview will be carefully planned. This means that for each individual interview a unique set of questions will be developed. However some general questions that could be asked of all interviewees are given below.

1. Biographical information
   Where were you born?
   Where did you grow up?
   What were your parents' occupations?
   What did you study at school/ university?
2. When and why did you first become interested in computing?
3. Did you have a mentor or somebody who inspired you?
4. What was your first job (in the computing industry)?
   Can you describe some of the equipment/ procedures involved in that job?
   Can you give any information about the different people you worked with?
5. What do you consider the most significant project(s) you have been involved in?
   Can you describe what was involved in the project(s)?
   Can you describe some of the equipment/ procedures?
   Who were the people involved in the project(s).
   Why do you consider this project was significant?
6. Could you tell us about a project you have worked on that has gone not so well?
   Describe the project.
   What went wrong and what were the reasons behind this.
7. What have you found the most enjoyable/ satisfying thing about working in the computing industry?
8. How have you managed your work/life balance?
   Would you do anything differently?
9. What are the most significant changes you have seen in the computing industry over the course of your career?
10. What has been our involvement in the New Zealand Computer Society?
    What have been the benefits to you personally of membership of the NZCS?
11. What do you feel the NZCS has contributed to computing in New Zealand?
    What direction should the NZCS take for the next 50 years?

Early PC advertising for Apple Computers

Endnotes

1 The New Zealand Computer Society was renamed Institute of Information Technology Professionals (IITP) in July 2012.

2 Interviews were carried out from July 2010 to February 2012. In 2015 the interviews were deposited in the Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

3 A.C. Shailes, 'The Impact of Computers on the Public Sector' in W.R. Williams (ed), *Looking Back to Tomorrow: Reflections on Twenty-Five Years of Computers in New Zealand,* New Zealand Computer Society, Wellington, 1985

4 Marc Prensky, 'Digital Natives, Digital Immigrants Part 1', *On the Horizion, vol. 9, no. 2, 2001*, pp.1-6.

5 'New Zealand Computer Society Silver Jubilee Oral History Project', Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand, 1984; W. R. Williams, *Looking Back to Tomorrow,* 1985

6 *Taming the lightning,* http://www.wordworx.co.nz/Telecommhist.html

7 John Hine, interview by Jim Whitman, 28 July 2010 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

8 Jim Higgins, interview by Janet Toland, 1 Nov 2010 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

9 Andy Linton, interview by Jim Whitman, 14 Feb 2012 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

10 Nathan Torkington, Interview by Jim Whitman, 9 Nov 2010 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

11 Elizabeth Eastwood, interview by Jim Whitman, 14 Nov 2011 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

12 Margaret McLeod, interview by Janet Toland, 10 & 29 Feb 2012 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

13 *Nodecode* was developed by John Payne.

14 Frank March, interview by Jim Whitman, 24 Aug 2011 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

15 For a fuller version of this story see Keith Newman, *Connecting the Clouds: The Internet in New Zealand,* Activity Press, Auckland, 2008

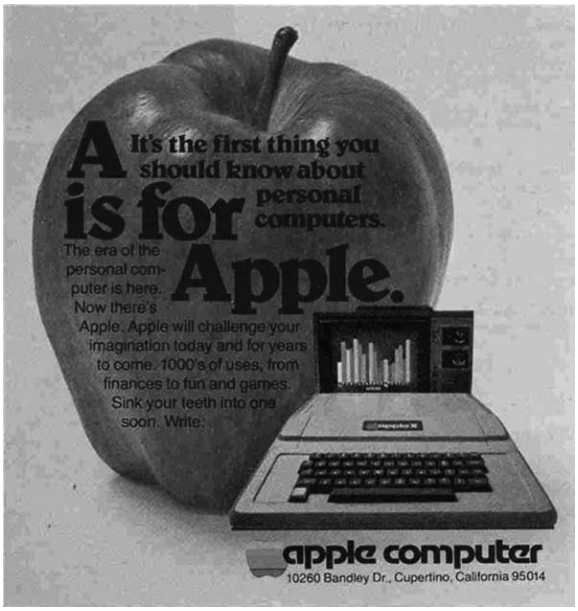
16 Sid L. Huff, '*Wired Wellington: The Info City Project and the City Link Network*', Ivey Business School, University of Western Ontario, 1996

17 Open source is where programming code is made publically available rather than being proprietary.

18 Don Christie, interview by Jim Whitman, 5 Jan 2012 for the New Zealand Computer Society 50th Anniversary Oral History Project in Oral History Centre, Alexander Turnbull Library, Wellington, New Zealand

19 Jim Higgins was President of the New Zealand Computer Society from 1985-1987 and Chair of InternetNZ from 1997-1999, as well as being a Life Member of the ALGIM Executive, and a Fellow of IITP. Liz Eastwood is an Honorary Fellow of IITP, Chair of the Wellington Branch of NZCS/IITP from 2007 to 2009 and 2011 to 2014, and also organised the 1989 and the 2010 national NZCS conferences. Frank March was the Chair of Internet NZ from 2009-2013, Jim Higgins, John Hine, Andy Linton & Frank March are all Fellows of InternetNZ. Don Christie is currently (2015) Co-Chair of NZRise and organisation which aims to help digital technology businesses across New Zealand reach their full potential. He was also was President of the New Zealand Open Source Society from 2007-2010

20 Lesley Hall, 'Nibbling at the Crumbs: Gender relations in Science in Aotearoa/New Zealand', *Oral History in New Zealand,* vol. 20, 2008, pp. 20-24



Early PC advertising for Apple Computers