

## Computing Educators Oral History Project (CEOHP)

1 **Judith Bishop**

2 **28 June 2006**

3 **Bologna, Italy**

4 **Interviewer Barbara Boucher Owens**

5

6 **Part I**

7 **B: This is an interview with Judith Bishop of Pretoria University, South Africa.**  
8 **It is being recorded on June 28, 2006, in Bologna, Italy, as part of the Computing**  
9 **Educators Oral History Project. Did I get your name right?**

10

11 J: Absolutely.

12

13 **B: Very good. Well, thank you, Judith, for agreeing to be interviewed on such**  
14 **short notice. I have some questions; let us begin by going way back, thinking about**  
15 **your parents, thinking about your early years. Did your parents have college**  
16 **degrees?**

17

18 J: My father did; he was trained as a lawyer and eventually rose to be a judge. My  
19 mother didn't; she brought up seven children. [Both chuckle] So she recently turned 80  
20 and she said she had learned quite a lot in that time so she didn't really think she needed  
21 the college degree.

22

23 **B: Was that in South Africa?**

24

25 J: Yes.

26

27 **B: Were they either interested in computing or engineering or math?**

28

29 J: Well, no as far as all of us were concerned, computing didn't really come into  
30 existence until about 1967, when we all went along to the university's open day and the  
31 first computer was revealed and shown to everybody and that is when the word came into  
32 our consciousness.

33

34 **B: Were you a good student in those early years in school?**

35

36 J: Well, I was an obnoxious student because I was too good I think. I was at a  
37 convent which was not really known for its academic prowess. I think I was very good at  
38 mathematics and drove the teachers crazy. But ... I enjoyed my school life very much. I  
39 enjoyed English as well as mathematics, yes.

40

41 **B: Did you have brothers or sisters that went on to college? You said there were**  
42 **seven of you.**

43 2:11

44

45 J: Yeah, we ended up all ... I was number two and we all ended up being high  
46 achievers in different directions. Mathematics, veterinary, geology, phys. ed., lawyer, and

## Computing Educators Oral History Project (CEOHP)

47 so on. So, yeah, our environment at home was very much an academic one. The boys  
48 were all at a private Jesuit College. I was the only girl for a long time and some of the  
49 time I used to go to the Jesuit College for extra maths lessons so that I could get ahead.  
50 The town I grew up in had many schools. It was a town which was well known for  
51 having a university and schools and so it had a very much an academic ...

52

53 **B: What town?**

54

55 J: It was called Grahamston, is called Grahamston and it is down in the eastern cape. And  
56 it was settled by the English settlers in 1820 when they all came out from England to  
57 colonize that particular part of South Africa, it was part of a British government program  
58 and my parents were part of that – my ancestors were part of that immigration in 1820.  
59 So the English people there built the schools, built the churches, and eventually the  
60 university,

61

62 **B: During that period of time you said you were very good at math ... and English**  
63 **as well. Were there particular teachers that shaped you, were influences because**  
64 **you mentioned your home was really supportive?**

65

66 J: Yeah, it's hard to say. I suspect, yes, I suspect the nuns (they were all nuns and many  
67 of them came from Ireland, a couple from America). They were supportive, but of course  
68 their primary objective was to install discipline in the girls and make them into good  
69 citizens. I remember them more for that, probably.

70

71 **B: You had said that you were a bit of a challenge. Do you want to elaborate on**  
72 **that?**

73

74 J: Yeah. Well, it was simply that I could think a lot faster perhaps, than some of the  
75 teachers that I had at the subjects and had to stop sticking my hand up and giving the  
76 answers out loud and so on. That's what I remember.

77

78 **B: So you were interested in math, you were interested in English... how did**  
79 **you decide, I assume you decided that you would go into higher ed right away.**

80

81 J: It was normal. It was normal. I mean among my friends, my parents, their friends'  
82 children ... we all were going to university. There was no question. We were sort of en  
83 masse heading in that direction. And when I arrived at university I signed up for  
84 mathematics, to be a teacher. And this was the interesting bit because towards the end of  
85 that year, our first year, we were told that there was going to be a computer science  
86 course as from the next year which would be a two-year major and we could start if we  
87 wanted to. And of course I was already in love with this machine in the first floor of the  
88 physics block and I signed up straight away. And there were nine of us in that first class  
89 which was in 1970. So 1970 was the first class and I think it was also one of the first two  
90 in South Africa to run a full computer science course. And off we went and I never  
91 looked back.

92

## Computing Educators Oral History Project (CEOHP)

93 **B: So that after you saw, that in 1967, that introduction to the computer, you**  
94 **were in love. That was it. No looking back.**

95  
96 J: Yeah, yeah.

97  
98 **B: Were you disappointed, were you happy with it?**  
99

100 J: I was absolutely enthralled, particularly in the programming – to be able to make  
101 the computer do what I wanted it to do. And in those days we were doing all sorts of  
102 interesting projects. The first project I can remember was in fact to translate English from  
103 another language. I can't remember the other language, but I remember having to get a  
104 list of basic English words and formulate it into a linked list and a hash table and all this  
105 stuff. And to be able to take this English and produce it into a different natural language  
106 and that was only in second year that we did that. So we were pretty well challenged  
107 because the teachers we had were from physics and applied mathematics, obviously. And  
108 they were very bright. And they had all been to Cambridge University to get their  
109 doctorates and they had come back to teach us and they didn't hold back on anything.

110  
111 **B: What university?**  
112

113 J: The University was called Rhodes University. It was named after Cecil John  
114 Rhodes.  
115

116 **B: Can you remember ... you mentioned particular high school teachers, are**  
117 **there particular university teachers that you remember as an undergraduate ...**  
118 8:20  
119

120 J: Oh, definitely. We had two. The first one was Professor Ralph Braae (that's B-R-  
121 A-A-E), who was the head of the department of mathematics and he initiated this  
122 computer science course, which was called computer science from the beginning. He was  
123 very interested in numerical analysis, so he came from that side. But he saw the  
124 applicability to just like probably Babbage did to automatic computing and he could see  
125 that many of his equations and his work could be solved if he could write programs for it.  
126 So he was the one that started our computer science and then he employed a young man  
127 called Howard Williams as a second lecturer. And the two of them did all the courses.  
128 And Howard eventually went on to be professor and head of the department at Harriet  
129 Watt University in Scotland. He has just recently retired. And Prof. Braae died a while  
130 back. But his son, who was also part of our department, became Professor of Electrical  
131 Engineering at the University of Cape Town. He's still there. And another person who  
132 was in our group Francois Jacot-Guillarmod. He's quite well known because he was one  
133 of the two people that started the Internet in South Africa. If I could just explain that. As  
134 you know the internet sort of just came into force, in the early ... late 1980's, early  
135 1990's during which time South Africa was not accepted by the international community  
136 in many ways. And they formed an alliance with a university in the US to do a direct link  
137 to them and from there to the Internet.

## Computing Educators Oral History Project (CEOHP)

138 So that South Africa was then connected in the academic world. And Francois ran that  
139 and remained as head of the computer center of the university ever since. So he is  
140 heading up to be 55 years old now and that's where he's been and he should get a medal.  
141 [She chuckles]

142

143 **B: So you finished your baccalaureate degree... then**

144

145 J: Oh, ok, so we had a four year system – three years plus one. And I did that – three  
146 years plus one. Then there is a bit of a formative experience, if you can call it that, which  
147 we tend to have. At the end of my four years, Professor Braae said that he was going to a  
148 summer school called “Teach the Teachers” which was to be run by IBM and he was  
149 looking forward to that. He showed me the program and I said, “Well, Oh, I'd love to  
150 come to that because it was these lecturers from England who were coming up courtesy  
151 of IBM to teach really interesting things in computer science, and he said, “Well, I'll ask  
152 IBM if you can go.” And his phrase that he used then and I have used ever since is “Faint  
153 heart never won fair lady.” So he will ask, he said. So he asked IBM and IBM said,  
154 “Fine, “ I could go along, although it was for lecturers not students.

155

156 And so I went along for this two weeks' course where we had these people, Ewen  
157 Page, David Barron, and Jim Eve from the UK and they taught Computer Science and I  
158 really enjoyed it. And during that time I met somebody from another university in South  
159 Africa, University of Natal at Durban. And they said why don't I come and do my  
160 master's there? And I decided that would be a good idea to get more experience, so I  
161 moved to get my master's. And the master's was very interesting. And I think also was  
162 completely formative because they had there a computer, which was a Burroughs 6700.  
163 And everything was programmed in Algol and this was now 1973. So to have everything  
164 programmed in Algol with Algol string handling and so on; the operating system was  
165 written in Algol, you paged through it; you could alter it (and we did), was amazing. And  
166 I worked with very, very, intelligent people there who since have gone on to be heads of  
167 departments of Imperial College and so on. So it was very lucky that I managed to do  
168 that. Five years later I went back to that university and they were still using the software  
169 that I had written. So I was happy.

170 13:14

171

172 **B: Were you the only female or were there other females in that department? In**  
173 **both degrees – undergraduate and master's.**

174

175 J: When I was an undergraduate there were other girls, but when I was a post  
176 graduate at Natal the other women were all computer operators and they wore white coats  
177 and they were very strict. And they were feared as computer operators. I was the only  
178 non-computer operator female in the area.

179

180 **B: Did that bother you?**

181

182 J: It didn't bother me at all. I didn't even notice at that time that there was a  
183 difference. In fact we were so few, really, because our numbers were less than five or six,

## Computing Educators Oral History Project (CEOHP)

184 that the fact that there was one female didn't really stick out at that time. I certainly  
185 wasn't made to feel different, or special. And then afterwards, it was kind of expected  
186 that one went overseas to do a doctorate. So I applied to various universities and I was  
187 accepted by some and eventually I decided to go to the University of Southampton. And I  
188 arrived there in 1974 and spent three years there and got my doctorate.

189

190 **B: Tell me about that program.**

191

192 J: Well, it was very interesting because I've still got the letter that I received from  
193 Professor Barron, David Barron, which would have been in about May, '74, accepting me  
194 for going there and he said, "We are a small group and we are investigating interesting  
195 aspects of software engineering." And when I look back now, I don't even know if that  
196 term had been coined in 1974. That's a long time ago. But he used it in that letter. And in  
197 fact what happened was very exciting because Pascal had just been invented in '72 and  
198 we'd been poring over the Pascal report and so on at Natal, but having a Burroughs  
199 computer we couldn't run it because at that time it only ran on CDCs, that's the machine  
200 that Wirth had at Zurich. When I got to Southampton, David Barron said well, the thing  
201 we've got to do is get Pascal, because that's the future. And he's heard of Tony Hoare at  
202 Belfast University who together with Jim Welsh, who subsequently went to Australia,  
203 and Tony went to Oxford. But they were both at Belfast at that time. They had ported,  
204 they had done the first port of the CDC compiler, to an ICL computer and we had ICL  
205 computers at Southampton, so he sent me on an aeroplane to Belfast with a tape, with the  
206 objective of copying this compiler and bringing it back to Southampton, which I did and  
207 it worked. So we then had it and then we did the third port at our university onto the new  
208 ICL 2970 computer, 2900 series, which was the new wave of computers at that time. It  
209 had a step machine and descriptors and it was meant to really advance the state of the art  
210 of computer hardware. Unfortunately, it never really lived up to its performance  
211 characteristics. So we accomplished the Pascal compiler and it was a very good compiler,  
212 and so on, and we used it. But it was clear the machines weren't going anywhere very  
213 fast. And I did my doctorate, in fact, on descriptors and code generation for these kinds of  
214 architectures, which were called, structured architectures. And we organized during that  
215 time the first Pascal conference that was ever held, was in Southampton in 1975, no '76,  
216 sorry. In '75 we organized a conference on BASIC, which at that time was also very  
217 popular, teaching language was becoming popular, so those were the two conferences  
218 David and I organized.

219

220

221 **B: How did you get interested in teaching use of languages? Did Pascal make**  
222 **you ... how did that ...**

223

224 J: Well, David was a language person, David Barron. He had written a book called  
225 *Programming Languages*, which was very influential. It was a small book, came out in  
226 about '73 or '72 and it laid out the foundation for left- and right- assignment, and  
227 parameter passing and so on in a very readable manner. And was used a lot in Britain, but  
228 I'm not sure about the States, but it certainly was an early book on programming  
229 languages. So we were always interested in languages and I had for my honors project

## Computing Educators Oral History Project (CEOHP)

230 back at Rhodes University written a compiler for BASIC for the computer that we had  
231 there which was an ICL 1901a. And so I knew all about compilers. Languages were  
232 fascinating.

233

234 **B: Well, languages for educational purposes were just ...**

235

236 J: Well, no, I was also a teaching assistant for David Barron and so we had to  
237 persuade the department that we could switch from FORTRAN to Pascal for teaching. He  
238 wanted to do that. I was to be his right hand man on that. So together in fact for two  
239 years, we taught Pascal to first year students. And so I became interested in how to teach,  
240 at that time, yes.

241

242 **B: {inaudible mumbling} Your research experience was fairly practical  
243 compiler ... experience?**

244

245 J: Yes, it was compilers and the study of the match between languages and  
246 computers.

247

248 **B: Did you enjoy that?**

249

250 J: I enjoyed it very much. There were the usual dreadful moments when I found that  
251 I didn't know enough about the hardware. Of course this was all pre-internet time and  
252 one of the people who was particularly up on the whole subject was Peter Poole from the  
253 University of Western Australia and we used to correspond because he had a Burroughs  
254 running Pascal compilers, and I used to send him my programs by letter – take two weeks  
255 to get to Australia. He used to run them and send me back the output with annotations.  
256 Because I needed to know how that particular computer compiled the particular test  
257 program that I had.

258

259 **B: I've heard of 24-hour turn-around ...**

260

261 J: No, this was four-week turn around! [Both laugh] Oh, dear.

262

263 **B: I'm not familiar with the PhD programs in England, the way the PhD  
264 program is achieved in England. Is it strictly a research degree? Or is there  
265 coursework that goes along with it?**

266

267 J: I think then and now it is strictly a research degree. You start on day one; you are  
268 thrown in at the deep end; find yourself a project; start working and three years later,  
269 please hand in a thesis. That's it. [She laughs.]

270

271 **B: Was there a phase in your life that there were any interruptions from this  
272 very straight path?**

273

274 J: No, that was it, I mean I knew before I started university it was nine years and I  
275 would do it.

## Computing Educators Oral History Project (CEOHP)

276

277 **B: Have a piece of paper in your hand and ...**

278

279 J: Yep. That was it.

280

281 **B: You waved it and then what did you do next?**

282

283 J: Well, of course, during this whole period I had become entangled with a man and  
284 he was a mathematician and in the '70's it wasn't easy to get jobs in Britain for  
285 mathematicians, so we decided a smart move would be to go back to South Africa where  
286 he could get a job although he was British. So he went to South Africa and got a job there  
287 and so I had to follow. And the place where he went was Johannesburg, which was like  
288 the other side of the world as far as I was concerned. I'd never been to Johannesburg. It  
289 was the big, dirty city, and I'd always lived in a small town. So we went and lived there  
290 and I gradually got to know and like it very much, living in a big city and of course being  
291 at the hub of everything. And one of the other big shocks was that I had for the very first  
292 time work on IBM equipment. And if you think Microsoft has a bad name among  
293 academics now, at that time IBM had an even worse name. I mean if you were forced to  
294 work on their equipment it was the "baddest" thing because they made you use PL/I, IBM  
295 360 assembly language, FORTRAN. They'd never heard of Algol, let alone Pascal. So it  
296 was quite a shock, but we turned them round and we bought almost immediately an entire  
297 lab of Apple computers, Apple IIs and we ran Turbo Pascal on that. So that occupied a lot  
298 of my time.

299

300 **B: What university were you ... ?**

301

302 J: That was the University of the Witwatersrand.

303

304 **B: Would you like to spell that?**

305

306 J: "W" "I" "T" then water, "S" "R-A-N-D".

307

308 **B: Thank you.**

309

310 J: Which means "ridge of white water", which is where Johannesburg is built on and  
311 of course all the gold comes from, the most gold in the free western world ... so a very  
312 rich place and one of the two major English universities in the country. So we set forth on  
313 Pascal and Apple computers and then we got Macs and so on. We were always different.

314

315 **B: You were teaching, what was your teaching load like? How did you balance  
316 trying to get all these compilers going?**

317

318 J: Well, remember we didn't have the Internet, so there was no email. So your days  
319 were actually quite relaxed, if I remember our days were relaxed. We had lectures to  
320 give, we had tutorials to give, but when we went back to our offices it was quiet and  
321 peaceful and we used to go to lunch and we used to go home at 5. It was actually a very

## Computing Educators Oral History Project (CEOHP)

322 quiet life in those days that we had, the expectations were perhaps lower. I remember  
323 teaching advanced programming and then I wrote a book with David Barron on that  
324 which is sort of a data structures course now. What else?  
325

326 **B: So you kept up your alliance with him? He was still at Southampton. You**  
327 **were co-collaborators, then?**  
328

329 J: That's right. And then I taught compilers and programming languages, first year  
330 Pascal. And I suppose that is when I started my educator's aspect of life. Because I was  
331 asked by Addison Wesley, one of their editors came up to South Africa and just happened  
332 to be chatting in the office and said, "I'd like you to write a textbook." So I mean I was  
333 only what 29 or something and I said "Oh" and he said "Yeah, we need a book on  
334 Pascal," and so I thought "I could write on Pascal, I know all about Pascal." So I wrote  
335 the first Pascal textbook and that went to three editions plus Turbo Pascal version plus a  
336 version for engineers and scientists which my husband helped with. He did the  
337 mathematics on that. And we repeated that whole formula in Java. That sort of went on  
338 from there and that's where I started going to SIGCSE and ITiCSE conferences as well to  
339 find out what other people were doing and how they were doing it.  
340

341 **B: Were there colleagues at your institution? I mean you had this relationship**  
342 **with David Barron and your husband you said was working with you. Were there**  
343 **other colleagues?** {Both talk at same time}  
344

345 J: Indeed, indeed. It was very interesting. Because some of them also went on to  
346 write Pascal textbooks. But I was in a mixed department at that time of applied  
347 mathematics and computer science, which wasn't a bad thing. It gave us a certain  
348 direction. The students who came in from school were good at mathematics and they  
349 usually took both subjects. And the applied mathematics was mathematical modeling,  
350 numerical analysis type of stuff, so it fitted together quite well. Those people, we used to  
351 talk a lot. They started out very much FORTRAN programmers and got converted after a  
352 while. Yeah.  
353

354 **B: Were they all men at that time?**  
355

356 J: Yes. There was one woman and she left and then eventually I was the only one  
357 left. Only woman. Yeah.  
358

359 **B: What among those courses ... well, let's even look at all time. What's your**  
360 **favorite course to teach?**  
361

362 J: {Sighs}  
363

364 **B: A big sigh.**  
365

366 J: Courses come in different flavors. There are the ones that you can present so well  
367 because you are passionate about the subject, and then the other ones which are easier to

## Computing Educators Oral History Project (CEOHP)

368 present because it is easy. The work is easy. Of course, I suppose the one that has both of  
369 those is first year programming. The huge disadvantage of that one for us is that the  
370 workload is very high because you deal with an enormously large class. You've got like  
371 three hundred in that class. It's a big problem to teach first year programming. But you do  
372 know that you are forming the mind of students for the rest of their lives so that is very  
373 satisfying. But if you leave first year programming aside, I think Programming  
374 Languages is probably the course I liked to teach the best. I do compilers as well; I've  
375 done data structures. At the higher level I'm required to do the distributed systems  
376 courses so I do Distributed Systems, High Performance Computing – those are my  
377 research areas.

378

379 **B: You might talk a little bit about your research and how that kind of fits into**  
380 **your life.**

381

382 J: The research, it came out of my major area of research, came out in my Ph.D. But  
383 by the 1990's, computers were becoming part of distributed systems, so I got involved in  
384 a community of people who were looking at linking together computers and what were  
385 the languages required to express the links. So they were called configuration languages.  
386 And now they are called architectural description languages. So that's still languages but  
387 they are at the glue level. And that was part of what I did and that's kind of developed  
388 toward what I do now.

389

390 However, I do have a major interest since 2003 in mixing my educational interests with  
391 my research interests, and I've managed to make a success of that. I started out by just  
392 writing what many people in the SIGCSE community have done and probably thrown  
393 away eventually which is a little package to do graphical I/O in Java or Pascal or  
394 whatever. So I had these from long ago and in 2003 Microsoft came to me (of course, I  
395 was working at Microsoft for a little while) and they said, "We actually need one of these  
396 for a particular purpose. We hear you've done this particular work. Can you cook one up  
397 for us?" And that actually fed into this new version of Windows which is coming out  
398 which is called Windows Vista. And essentially what it enables you to do is express your  
399 GUI in XML and link it into your program in a very clean and simple way. And that  
400 work is going to come out in the IEEE's 60<sup>th</sup> Anniversary issue in September.

401

402 **B: Very good. Congratulations!**

403

404 J: It came all the way from "This is a little GUI package." But with my collaborator  
405 in Canada who wrote the C# book with me, we worked out the importance of the work  
406 and we positioned it correctly in the research environment.

407

408 **B: Do you have a teaching philosophy?**

409

410 J: H-m-m.

411

412 **B: Her eyes got big as saucers.**

413

## Computing Educators Oral History Project (CEOHP)

414 J: Oh, definitely. Don't talk down to the students. I think Dijkstra had the same. He  
415 said many teachers should be head up for (what was the word he used, anyway) for  
416 abusing the minds of the students. Don't give them stuff that they are going to have to  
417 relearn later; give it to them correctly the first time. They don't have much time,  
418 especially those students who are not going to be majors with you. Don't give them  
419 simple, simple, simple. Give them the real stuff as the physics people do, as the chemistry  
420 people do. Give them the real stuff. And so when I see very poorly written programs in  
421 introductory books on C, with if statements going if, if, if, if, I really feel we're doing the  
422 community in. I would rather just take it from a higher level, explain it well and give  
423 them something that will last a lot longer.

424

425 **B: I asked and I got. Thank you! {Both chuckle.} You've mentioned that you've**  
426 **been involved in SIGCSE and a couple of other organizations. What effect, or**  
427 **influence, and or part have they played in your life?**

428

429 J: I think the one that has played the most part is one that is not that prevalent in the  
430 American consciousness and that is IFIP. I don't know if you've heard of IFIP.

431

432 **B: Oh, yeah.**

433

434 J: I was invited to be a member of an IFIP group way back in 1980 and this is  
435 because IFIP liked to be international, just in the same way that SIGCSE is now proving  
436 to be the same stimulus for involving people on a worldwide basis. But at that time I was  
437 invited to go with this group and there was a group of about 50 people.

438

439 **B: What was this working group?**

440

441 J: 2.4 which was on systems implementation languages. It is now software  
442 implementation technology. But it's the group which basically looks at languages and  
443 compilers. And during the '80's we were the group that encompassed all the people  
444 working on Ada, working on Ada compilers, working on the feature development of  
445 languages that came out, They were very much the practical languages, not the functional  
446 or Algol-type languages. And we met every year and those people supported me and we  
447 all supported each other and they pushed me into positions that I would otherwise never  
448 have managed to get to from way down in South Africa. In terms of the ACM, I regularly  
449 did go to SIGCSE conference, not every year but enough, and also the IEEE I was  
450 involved with then to some extent with the conferences board and ACM I'm now just the  
451 outgoing chairman of the Software Systems Award, which I've been running for a while.  
452 But I haven't risen in the SIGCSE hierarchy at all. I'm a little bit on the fringe, I think.

453

454 **B: Is that choice or chance?**

455

456 J: Uhm. I have to say it would probably be by choice. The reason is one that might  
457 come out in other people's stories as well, is that we are forced at our university to do  
458 research and anything to do with education is looked at with a beady eye. I'm only ... and  
459 only a small amount is tolerated and we have to be very careful.

## Computing Educators Oral History Project (CEOHP)

460

461 **B: You've spoken about many mentors. You've talked about David Barron, and**  
462 **then you talked about the people that have pushed you through IFIP. What is your**  
463 **role as a mentor? Now do you see yourself as a mentor; can you tell any stories**  
464 **about what is happening?**

465

466 J: Yes, I mean I would like to be seen as a mentor, I love it when I see my ex-  
467 students in positions of authority and success, and it does happen and they pop up all over  
468 the world and they write to you and so on. I have many post graduate students. I suppose  
469 the mentoring is immediate. We have at our university and in our country various  
470 national mentoring programs and so on for women and one is meant to volunteer for  
471 these.

472

473 **B: And have you?**

474

475 J: Uhm. I think I have expressed interest but I haven't actually got involved, but I  
476 am for example in a couple weeks time going to be part of a panel for judging the award  
477 for the woman, the women's award for this year. That isn't mentoring, but ... it is some  
478 involvement. We have numerous groups and they all do things and I join them. {Both  
479 laugh.}

480

481 **B: I am going to skip back to teaching because I have noticed on my little cheat**  
482 **sheet that I have forgotten something important. Do you have a favorite teaching**  
483 **story, something that happened that you would like to relate ... some kind of**  
484 **classroom story?**

485

486 J: Uhm. This isn't exactly a story but it's one thing that I have done quite a lot, that I  
487 like to do, that I continue to do and that is towards the end of class, of the semester, not  
488 every time, but more often than not, I'll wind the students up by saying we're going to  
489 have a prize giving, or we're going to have a party. And then we do. So from the projects  
490 we select the best projects and we show them in a theater. And then we get prizes from  
491 the book sellers and Microsoft and so on and present prizes and I do that to make the  
492 students feel special and to give them something to take home to their parents. Being a  
493 parent myself, I know what a kick I used to get when the kids came home with a prize.  
494 And that seems to end dead when they leave school and go to university. So I have tried  
495 to put just a little bit of that in.

496

497 **B: You have just mentioned your children. How have you managed the**  
498 **balancing act between a wildly successful career and the children ... on the web**  
499 **page I did notice that you were the parent of two very successful children?**

500

501 J: Well the boys, I think the two secrets were: One I couldn't choose was my  
502 husband was an academic which gave him the same freedom I had in terms of how he  
503 arranged his day to some extent, as opposed to say a businessman or somebody where  
504 you have to travel on business incessantly. And so he and I when the children were very  
505 small could share many of the duties. And secondly we always had a nanny, and whereas

## Computing Educators Oral History Project (CEOHP)

506 that might sound like a colonial thing, I noticed last week when I went to have supper  
507 with a woman academic at the Technical University of Milan, she had a nanny and the  
508 nanny came in in the evening and put the children to bed so she could spend the time with  
509 her husband, and I think that the idea of having three people to run a house is probably a  
510 better formula than two. {Both laugh} That's what we did, that's what we did. Yeah. And  
511 the kids turned out. Well we always took them everywhere. We went on sabbatical.  
512 They've been to school in many countries and that provided some instability for them  
513 because they kept missing their friends but it provided them with a view of the world they  
514 will never forget. It is a hard decision, that one.

515

516 **B: Did you ... are there any compromises in your ... that you made. You did say**  
517 **one, you followed your husband to ...**

518

519 J: Well, that wasn't exactly the first time I had to follow him. And I do think that  
520 there is a gender difference. Men in my experience feel very sensitive about the  
521 importance of their jobs. That isn't to say that women don't, but I think they have a  
522 higher sensitivity that the job is very important to them in terms of their self esteem and  
523 their position in the family and their position vis-à-vis their colleagues. So at another time  
524 in the late 80's when the political situation was very bad in South Africa, we moved to  
525 England, which was intended to be a permanent move. And I had a very good job there. I  
526 was appointed as a reader back at Southampton, but Nigel couldn't get a permanent  
527 position. We thought he would get one when we got there. When that didn't happen after  
528 two years we actually went back to South Africa, because of his job position. And then  
529 every time we went on sabbatical, he had to choose the place first, and as a computer  
530 scientist, I always got a position. Computer scientists were welcome more or less  
531 everywhere. So I went to the Software Engineering Institute in Pittsburgh, because he  
532 was at the University of Pittsburgh and I went to the University of Cambridge Computer  
533 Laboratory because he was at the University of Cambridge. Well these were great places,  
534 but not necessarily the ones I would have chosen. Yeah.

535

536 **B: Do you have any outside interests? ... any strong interests besides**  
537 **computing?**

538

539 J: Oh, well, I had one, which I think was a wonderful one for the time. I was very  
540 big in the Scouts, the Boy Scouts. I did that for ten years, when the children were young.  
541 And I used to go camping and I had my own troop of little boys and we went all over.  
542 And it was a nice, outdoor, outdoor interest. But I eventually stopped that. And I suppose  
543 my interests are now centered around travel and reading and music and opera and that  
544 stuff.

545

546 **B: What kind of reading do you like to do?**

547

548 J: Travel.

549

550 **B: Travel.**

551

## Computing Educators Oral History Project (CEOHP)

552 J: {Both laugh} Reading about travel!

553

554 **B: Well, we are getting down sort of the end of our time together. If you could**  
555 **give advice to a young woman starting out a career, what would it be?**

556

557 J: I think to retain the element of excitement. I express it this way. That when I  
558 started a computer filled an entire room and it had a tiny amount of memory and it could  
559 do only one thing, but that computer handled everything that was required by our entire  
560 province, not only the university, Now that was thirty years ago. What we can be certain  
561 about is that in thirty years time computers will look nothing like they look like now. And  
562 I think it is enormously exciting to be part of that process. So to try to keep ahead and not  
563 stay with what you perhaps you had learned ten years ago. Keep moving, keep moving,  
564 because the excitement in our field is in the change.

565

566 **B: Completely different question. If you could change one career decision you**  
567 **made, which one would it be? Or maybe there are no decisions.**

568

569 J: I think I would like to have changed this one but I don't think we normally can.  
570 Obviously, I think I would like to have written more research papers. I would like to have  
571 a CV with 300 research articles or something like that.

572

573 **B: Instead you have one with 70.**

574

575 J: Yeah, but 70 is not good, not for somebody of my age in a research career. You  
576 would probably want to have double that. So that would have been ... instead of fooling  
577 around doing Pascal compilers and working out how to handle the optimal strategy for  
578 managing the laboratory so that everybody got a good chance and the students liked you,  
579 write another research paper. That would have been an alternative. I'm not sure I would  
580 have done it.

581

582 **B: And I do have to... this isn't the last question, I'm going to ask you, but it is**  
583 **the next to the last. You have on a lovely necklace that has a story.**

584

585 J: Oh, the story of the necklace.

586

587 **B: I have to tell you it is black and white beaded necklace, and I believe it has a**  
588 **story. Am I right?**

589

590 J: Yeah, but this is not the right one, although this is a lovely one.

591

592 **B: You didn't wear the right one?**

593

594 J: I forgot! But I'll tell you the story of the necklace.

595

596 **B: You can tell me the story of the one you have on, too, if you want.**

597

## Computing Educators Oral History Project (CEOHP)

598 J: Oh, yeah. This is a native bead necklace and it has 5 different segments and each  
599 segment is different and so...traditional necklace from Africa. But the one I should have  
600 worn is pearls and in the center it has a symbol which is like a, a symbol of an atom or  
601 something, in gold with little diamonds on it. And this was specially created as the award  
602 for the woman in science last year because last year was the year of physics and also  
603 Einstein's birthday. And they give this award each year in South Africa to the top woman  
604 scientist. Now of course, they usually envision this woman will be a physicist or chemist  
605 or somebody like that so when the necklace was eventually presented to a computer  
606 scientist it did a look a little bit incongruous because of this curly atom. But I love the  
607 necklace and I do wear it a lot and it always incites comments. It does mean a lot; it was a  
608 great moment both for me and for computer science that I was chosen.

609

610 **B: Congratulations. If there is one story that you want to tell right now so that it**  
611 **won't be forgotten by the world, what would it be?**

612

613 J: Story? Uhm. One story. Ha. I think perhaps the one is about my mother.

614

615 **B: OK**

616

617 J: She never went to university but I can always remember the sense with which she  
618 supported the education of all the children. And I was a great disappointment to her,  
619 because I was not the daughter she wanted. She wanted a daughter who was interested in  
620 frilly dresses and going to parties and getting boyfriends and showing off the womanly  
621 side of life. She had five boys; she didn't really want another tomboy, which is what I  
622 turned out to be. But she rose above that and she eventually came to terms with that, I  
623 think, by the time I was about 16, she had given up on the frilly dresses. So she  
624 eventually decided that she needed the best for me, so she arranged, as I said, with a  
625 Jesuit college for me to go and do extra maths. And then, as I was heading for university,  
626 she said, "Well we better go and see what you are going to do." So she took me to one of  
627 these psychology assessment people and I had to do all these tests, and I came out and  
628 then we had to go in for the interview and there was a deathly silence, and my mother  
629 was saying, "Oh, she didn't do so well then". And the psychologist person said, "Well no  
630 she did fine. Her marks are just off the graph, so I think your daughter is going to be the  
631 first person on the moon." {Both laugh} I wasn't actually the first person on the moon,  
632 but I think my mother was then reconciled eventually to a clever daughter and then ever  
633 since then they have kept a scrapbook of everything I've done and been enormously  
634 supportive.

635

636 Yeah. I think parents are extremely important, and therefore, when you become parents  
637 yourself, one has to pass the torch on and be supportive also to your own children. And if  
638 you are at all lucky that they can follow you in computer science.

639

640 **B: And did they?**

641

642 J: My one son nearly did. He started out and then he became a musician. He was  
643 doing computer science and music and decided to stay with music.

## Computing Educators Oral History Project (CEOHP)

644

645 **B: Well, I really thank you for this, Judith, rather short time.**

646

647 J: Pleasure.

648

649 **B: It was very interesting to talk with you.**

650

651 J: It was a pleasure to do so.

652

653 B: Thank you.

654

### 655 **Part II**

656

657 **B: This is an interview continuation with Judith Bishop of Pretoria University**  
658 **in South Africa conducted on June 28, 2006. We wrapped up the interview and then**  
659 **thought about it and there were a few more questions we forgot to ask and we had**  
660 **the time, so Judith---**

661

662 **What can you tell me about that was important when you as a woman faced the**  
663 **tenure track issues?**

664

665 J: OK, I started lecturing as a lecturer as it was called in those days; I suppose the  
666 assistant professor level in 1978 when I would have been 27. So I was young, just  
667 married and really keen and eager to do my job. As it turned out, computer science was a  
668 very young field then and fully trained computer scientists with the PhD in computer  
669 science were few and far between, so I was fast tracked within the department and given  
670 promotion very easily. I moved up to associate professor in just a few years and I was a  
671 professor by 1983, so in effect I could just relax after that. I didn't face the hurdles that  
672 people face these days because there wasn't any competition. These days even for women  
673 it is pretty much more difficult, I think. So that was very easy. Now when I see women  
674 who are struggling with the same level as men, I can sympathize actually with their  
675 dilemmas, because trying to get sufficient papers and sufficient involvement in academic  
676 life and so on and at the same time bringing up a family is very difficult.

677

678 **B: I appreciate that. Well, you sort of said that it was difficult for women and**  
679 **for women in computing these days, but the broader question is how do you feel**  
680 **about computer science education in these current times.**

681

682 J: From going to computer science conferences and reading ... computer science  
683 education conferences and reading proceedings, which I usually do if I can't go, I am a  
684 little bit dismayed because I feel that the people who attend the conferences and so on are  
685 aging; there seem to be more older people than younger people that I see, and they are not  
686 moving with the times. They tend to present ideas which they learnt many years ago and  
687 which they feel work. Then they tweak them a bit to present them in a new way, or to  
688 have some new tip or technique which works and which inspires them on their home  
689 ground, but does not actually open their minds to what is going on in the field in

## Computing Educators Oral History Project (CEOHP)

690 computer science both in research and in technology. So for example, I can take one  
691 concrete example that I listened almost with horror at stories of programming languages  
692 courses that are being taught where the languages being presented all came from pre-  
693 1985 days. Presumably this is because that is what these teachers are familiar with and  
694 comfortable with teaching, but if you don't have research pushing you and the impetus,  
695 and the stimulus of that research making you read, use, the modern stuff, I don't think  
696 you end up feeding it back into your teaching and so I am worrying about people who  
697 spend their lives just in education.

698

699 **B: OK. I guess finally, well have you had any lucky breaks?**

700

701 J: I think I have. And in a way this follows on from the last question. I have been  
702 lucky in that I have been able to keep abreast of technology because I've been involved  
703 with companies. So in particular in 2002 I received a grant from Microsoft. It was a  
704 competitive grant, a worldwide, competitive grant. There were only 42 given out of more  
705 than 100 applications and from that I then became involved with Microsoft Research,  
706 which is a wonderful, wonderful organization with some of the brightest minds on the  
707 planet. And I went and worked with them for 5 months and then they invited me to  
708 lecture on their academic lecture circuit in Europe. And I went all round Europe,  
709 traveling, meeting people, meeting people from all different countries seeing how they  
710 operated but always in this more mixture of research and teaching than one tends to find  
711 at SIGCSE conferences, so that was very stimulating. And through the Microsoft push, I  
712 got to hear about new things in advance and be almost forced to know about them  
713 because people would ask me, "Oh, you are with Microsoft, can you tell me about this  
714 new Microsoft thing?" I had to have an answer ready, which meant I had to swat it up.  
715 And I couldn't be clueless or say, oh, well you know that's just technology. I now have  
716 great respect for what any of these big companies does. Not just Microsoft, I am sure the  
717 same is true with IBM, with Sun, with Apple. If you manage to get in with them and  
718 learn about technology at very intense level, it is hugely worthwhile.

719

720 **B: And finally, are there current influences and important women in your life**  
721 **right now?**

722

723 J: Indeed, I think so. I think there is a bond that develops between women of one's  
724 own age if you've met when you were younger, or even if you meet when you're older. It  
725 enables you to click whenever you happen to be in the same place at the same time. And I  
726 find this enormously rewarding. In particular, I could mention, for example, Wendy Hall,  
727 who is the new vice-president of ACM, and she and I were at University together. And to  
728 watch her climb the ladder to become vice-president of the Royal Engineering Society,  
729 on the Prime Minister's Science Board, and so on, this is in the UK, she is now on the  
730 European Science Commission, and yet see what a *joie de vivre* she has for life and  
731 charging around and doing all sorts of things, setting up this new company, and so on,  
732 and the sheer energy of it all. I find people like that just send me away, and think, oh I  
733 can carry on doing that now.

734

**Computing Educators Oral History Project (CEOHP)**

735 **B: Thank you. I am glad you added the stories that you did at the end and I think it**  
736 **enriches our time together. Thanks.**  
737