

On What is Known : a Personal Viewpoint

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When I was a little girl and went with my father on a walk to the bank I was always left in the street outside while he conducted his business, since it was known that the spiritual nature of Woman, although making her the superior of Man, unfitted her for financial matters.¹ Later, at High School, it was known that girls did not study the physical sciences, since they had better things to do in life, so I was gently steered towards the study of 'Domestic Science' (which was neither scientific nor domesticating). I was also keen to study Latin and German at school; however it was well-known (and explained to me very carefully) that girls did not have the intellectual capacity to study Latin. German was not available at the school I attended (in South Africa) so I was compelled to study 'Afrikaans' a language which has never at any time been of any use whatsoever to me. The adults who surrounded me when I was a girl all without exception knew that it was obligatory on a woman to get married, have children and spend her life doing the dirty work for other people. This, of course, should be done without pay, since her superior spiritual nature was enhanced by noble self-sacrifice; it was known that paying a woman to do housework or any other kind of work was degrading. It was greatly regretted that in the small co-educational school I attended a low level course in mathematics was compulsory for all children, even the girls. However the mathematics master was on the whole able to cope with that one. One of my fellow students was reduced to tears at every mathematics lesson until her parents, who knew that mathematics was unnecessary for a girl anyway, took her away and sent her to the local convent to be educated, where they did not teach the girls wicked things like mathematics or science. As for myself, the poor man was unable to find a mathematics problem which I could not solve. This upset him greatly. However, he knew that I had no chance of being accepted into University mathematics courses, since I lacked the higher stream school mathematics. This was a great comfort to him since he knew that the study of higher mathematics would warp irrevocably my sweet womanly nature.

I entered University a few days after my seventeenth birthday, after a spot of family blackmail on my part and the interference of the Professor

of Mathematics and Dean of Science at Natal University College, Professor J. McKinnell, who overruled the entrance regulations and accepted me as a student of pure mathematics and physics. Here at University I found people who did not seem to know that it was incorrect for women to study mathematics and science. Neither McKinnell nor my mentor in physics J.R.H. Coutts seemed to have the right ideas. Indeed Coutts (an internationally respected soil physicist) not only did not know everything including the place of women in society but openly admitted this, often directing me to the scientific journals when I asked him a question. Coutts used to pause at my bench when he did the rounds in the physics laboratory; as he wandered off to the next student I would often hear him mutter "Yes, the best student I ever had was a woman." When I completed my BSc at the age of nineteen both gentlemen advised me to proceed to a higher degree (in mathematics and physics respectively); unfortunately it was known that women don't do research so there were no grants available for me. I graduated in physics with a group of twelve men. I think I was the best student; why else did the others copy my tutorials? I remember one of them being very downcast when Coutts gave him only half marks for an answer for which I was awarded 100%. Nevertheless two of the twelve obtained scholarships to proceed to a PhD degree. The others all obtained jobs within a few weeks of graduating. When I applied for jobs however I found that it was known that women are totally unemployable in the scientific world. Not only were they known to be intellectually inferior to men but they were also known to be unreliable since they would leave the job at a moment's notice in order to marry and have babies. The idea that a married woman could have a paid job was known to be immoral and was therefore unacceptable to all right-minded people.

After three years of taking odd jobs in factories and so forth, I was fortunate enough to obtain a post as temporary filing and registry clerk with the Council for Scientific and Industrial Research (CSIR), Johannesburg. I was put in charge of a group of women who worked on calculating machines in the mathematical statistics section. I worked under the direction of men who had the same qualification as myself. I thought that on the whole these men weren't as good in science and mathematics as myself, but because they were men it was known that they should be in charge. I moved from CSIR to a business consulting firm where my work was mainly in operations research and then to the Chamber of Mines where I worked as a statistical consultant. The consultant mining engineers with whom I worked had a hard job adjusting to a woman mathematician, but on the whole they managed well and I even gave a talk to the South African Mining and Ventilation Society, to the consternation of many of the members.

The Professor of Mining Engineering at Witwatersrand University (in Johannesburg), R.A.L. Black was yet another eccentric professor who did not seem to know the correct place of women in society. He required his students to be taught some mathematical statistics and didn't seem to realise

that this should not be done by a woman. Accordingly I found myself teaching in the mathematics department at Witwatersrand University, my main duty being to lecture to mining engineering students. Just as I was settling down happily to an academic career under the benign guidance of J.M. Hyslop and F. Young (Professors of Pure Mathematics) and J. E. Kerrich (Statistics), events outside University circles caught up with me.

At this time it was known in South Africa that Black people were markedly inferior to White people and that they would not, therefore, benefit from having a University education. Black students were therefore excluded from Witwatersrand University by government decree (in 1959). It was also widely known that Black people were unable to govern themselves since they did not have the intellectual capacity. Thus they had been excluded from the voter's rolls by the 1910 Union of South Africa Constitution which was drawn up in Westminster. It was greatly to be regretted that certain misguided Black people objected to this treatment, thought they were entitled to vote, and had organized themselves for this goal by 1912. Wicked Black people continued to agitate, albeit peacefully, until 1960 when groups of them converged on police stations round South Africa and attempted to hand in their 'passes' in a peaceful but of course totally depraved way. Many of these sinful Blacks were actually laughing as they ran away from the police at Sharpeville, seventy miles from Johannesburg and the police, quite correctly, shot them in the back for their disgraceful behaviour.

I decided that South Africa was unsuitable for a research scholar so I left and went first to Britain and then to a post as a lecturer in the mathematics department of the University of Western Australia. Here I found that the two Professors knew that the duty of a woman mathematics lecturer was to take an increased teaching load so that the men were able to spend more time on their important research. Since 'Bobbie', a charming woman tutor in the department, was known to be totally happy teaching full-time it was a source of great mystification to both mathematics Professors that I was not willing to give up my research in order to be a happy and well-adjusted woman lecturer. I was at this time very busy with some early systems ecology to do with *Tribolium* beetle populations^{32,33} with splendid co-operation from colleagues in Chicago who were working on the beetle.

I decided that the University of Western Australia was unsuitable for a research scholar so I left and took a Senior Lectureship at Adelaide University. At the interview for the post which was in the Waite Agricultural Research Institute I pointed out to the Director J. Meville that I was deeply involved in research work and would be unavailable for routine statistical consulting; he reassured me on this point: a Senior Lecturer was expected to teach undergraduates and do research and special statistical consultants were hired by the Waite Institute to attend to routine consulting.

Once again I proceeded to settle down happily to an academic career. The group of distinguished and brilliant animal ecologists in the University led by H.G. Andrewartha and T.O. Browning clearly did not know that it was incorrect and immoral for a woman to do research. My Tribolium work prospered and I earned a nice fat National Science Foundation grant which took me to the United States (in 1973). However events in the University outside ecological circles were catching up with me.

A new Director at the Waite Institute knew that a woman would never have been appointed to a Senior Lectureship (a senior post in Australian Universities) except on the understanding that her 'research' activities would consist of doing statistical consulting full-time in order to assist her male colleagues with their important research. Most of the aforesaid male colleagues knew perfectly well that this was the case and had been so on my appointment. A desperate last ditch attempt by H. G. Andrewartha who came back out of retirement (in 1978) to talk to the Director was partially successful; the constant harassment ceased completely for four months; during this time I was able to complete some of the initial work on my new research on formalized theory of ecology⁴. However the pressure built up again to the extent of several visits per week from a colleague who knew he was my senior in the hierarchy.

I decided that the Australian University system was unsuitable for a research scholar so I left and looked round a suitable spot in which to carry on with the new research which, to my slow-witted feminine brain, seemed to be doing quite well. I discovered that the ecologist at Griffith University (in Brisbane), R. L. Kitching, also did not seem to know that it was indecent for a woman to do research, so with a good deal of help from him I moved to Brisbane, attached myself to Griffith University in an honorary capacity (in 1980) and settled down happily to the life of a research scholar⁵. Because I was not teaching and thus not in receipt of a salary I invested my savings and superannuation for my previous post as carefully as I could. This was difficult for me since, as is well-known, women are grossly unfitted for financial management. At the same time I applied for a grant in lieu of salary from the Australian Research Grants Scheme. Unfortunately I now came up against another area of knowledge which has, to date (April 1987) militated against my obtaining a grant.

My new research followed the lines of the distinguished biologist and logician J. H. Woodger who described a formalization, as opposed to mathematical modelling, in the following words⁶: "In considering the relation of mathematics to biology we must distinguish between the process of applying existing mathematics to biology and the less familiar process of letting biological statements suggest new mathematical ones". However it is widely known among both mathematicians and biologists that Woodger's work was a failure in that it contributed neither to mathematics nor biology; it is known, therefore, that all scientific work using the same approach must necessarily be unsuccessful. Thus when I had the audacity to apply to the

Australian Research Grants Scheme my work was quite correctly assessed as being "arid, sterile and useless". This worried me very much, since I was obviously grossly deceiving my ecologist colleagues and I wrote urgently to the ecologists H. G. Andrewartha and L. C. Birch (in 1984) explaining this to them and suggesting they withdraw their new ecology book⁷ since not only was their analysis of environment based on work which was arid, sterile and useless but they had included an Appendix written by myself in which I gave my formalization of the notion of an animal's environment. It is greatly to be regretted that these two authors have refused to withdraw this corrupt and evil work, in which the underlying mathematics is known to have followed totally useless lines and furthermore to have been constructed by an immoral and misguided woman (who ought to be having babies). The particular Committee of the Australian Research Grants Scheme which handles my applications is the Committee dealing with all pure mathematics and physics grants : as is entirely proper only men are members of this Committee (during the years 1981 to 1987) since it is well-known that women not only lack the capacity for such disciplines but also are unfitted for handling financial matters including grants.

It is known that the delicate nervous system of the female mathematician is often soothed by the contemplation of non-overlapping sets. In particular, therefore, I have been greatly comforted by the following naive but very neat classification of people :

I. People who know that little girls should not be corrupted at school by lessons in science and mathematics and that women have better things to do than scientific research. This set of people is well represented in the science departments of Australian Universities by the distinguished gentlemen who sit on appointments committees. The major criterion for a senior appointment is the number of publications ; since the gentlemen who already have tenured appointments are in a position to turn out many articles, with the help of their research assistants and Ph.D. students, the status quo is being manfully maintained. Women who for special seasons are prevented from doing research when young are not in the race and the number of women Professors in science is well under the 50% which a naive mathematical statistician would expect. These learned and distinguished gentlemen are greatly aided by highminded colleagues who carefully advise women University students not to proceed to higher degrees, and schoolteachers and parents who explain to their charges that science and mathematics are too big a strain on the frail intellect of the human female. There is a large overlap between this set of people and people who know that Blacks are inferior but I have not yet been able to determine whether the two sets are identical.

II. People typified by the soil physicist J. R. H. Coutts who seem quite unable to acquire this knowledge. They have even been known to encourage a little girl to study interesting subjects and to support a woman colleague in the Australian Universities. Fortunately such wrong-headed,

ignorant and misguided people are very rare.

III. The singleton (Myself). I knew when I was a little girl that I liked mathematics and was better at it than the other children, both boys and girls. I knew as an undergraduate that my fellow students in the physics course copied my tutorial exercises because they were incapable of solving the problems themselves. I now know that I should have started my research career at the age of nineteen, as my original mentors in mathematics and physics advised. I know that having now achieved my research career, even if unpaid and largely outside the University system, that I am doing the thing which best suits my intelligence and personality, however delicate and womanly. I know that the main reason why the Australian Research Grants Committee won't support me is because their assessors cannot abide a mere woman succeeding where they failed; they are viewing my growing publication list⁸ with horror and my rapidly increasing international scientific status with dismay. I am not sorry for them; I also know, as a statistician, that I have a good chance of outliving them.

The neat classification of people pleases me greatly since I myself belong to what set of people who never know that they are talking about, nor whether what they are saying is true⁹.

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9. Russel, B. (1953) Mathematics and the Metaphysicians. In : Russel, B. *Mysticism and Logic*, 74-94. Mitcham, Victoria, Australia: Penguin. Russel wrote' "....mathematics may be defined as the subject in which we never know what we are talking about, nor whether what we are saying is true".