FROM ATOMIC ENERGY TO NUCLEAR SCIENCE; A History of the Australian Atomic Energy Commission

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CERTIFICATE OF SUBMISSION

This is to certify that this thesis has not been submitted for a higher degree to any other university or institution.

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SUMMARY

Nuclear energy was once seen as a possible answer to man's energy needs, but it could also be used to produce the most destructive weapons known. The initial research into the phenomenon of nuclear fission was done at university laboratories in Europe on the eve of the Second World War. This war led to the development of the first nuclear weapons. After the war, many nations wanted access to both the weapons and the source of cheap power that the process of nuclear fission provided. Australia was one such nation.

The Australian Government wanted nuclear energy to help develop the dry interior of the continent. There were many in Government who also wanted nuclear weapons. This work focuses on the Australian pursuit of nuclear energy for peaceful uses. The achieve this aim an organisation was established which would train scientists and engineers in nuclear science and technology. This organisation, the Australian Atomic Energy Commission, is the subject of this thesis.

This work will examine the political influences that governed the Commission in its function and scientific research paths. Specifically, it will examine how successive governments caused the Commission to cancel projects, change the direction of its research, attempted (on several occasions) to amalgamate the Commission with the CSIRO, forcing the organisation into uranium mining and finally abolishing it and replacing it with a new organisation, the Australian Nuclear Science and Technology Organisation. Government interference would continue with this new organisation which had its entire board dismissed in 1993.

The Commission was essentially a scientific and engineering organisation and hence this thesis will also consider a number of projects with which the Commission was involved such as the Beryllium Project, uranium exploration and mining, the uranium enrichment programs, the purchase of two nuclear reactors, the Synroc project, and the ill-fated Jervis Bay power reactor project. Other projects which were started in the early days of the Commission, the neutron diffraction work and the isotope production projects, will be mentioned in passing. Both these projects require a more detailed appraisal than is possible in this thesis.

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PREFACE

When one decides to write a history of a scientific organisation one must decide initially whether it will tell the story in great detail and hence attempt to write a definitive history or whether it is better to write an overview which focuses on specific events. My choice was made easy, for a PhD thesis one is constrained by a number of factors, time being of the essence and funding for specialist overseas archival research being a secondary consideration. One is expected to research and write up one's research in a span of a few years. This time frame does not allow one to develop the subject area into a more detailed work such as the official histories of the UKAEA or the USAEC. Detailed histories such as these require more resources than those at the disposal of a mere postgraduate student.

Further, as an unproven new researcher and one researching an organisation that has come under continual criticism for the last twenty years, I was unable to gain access to private papers and other materials belonging to the AAEC which are currently held in the National Archives of Australia Repository in N.S.W. Research material accessed for this work came from government files located in the National Archives of Australia in Canberra, the Annual Reports of the AAEC and ANSTO (many of which were borrowed from ANSTO at Lucas Heights), interviews with some of the scientists involved with the Commission, five publications written about the Commission and many publications on Australian history and the biographies of individuals who have had an impact on the Commission.

The AAEC has not had its official history written. When it was first suggested that I undertake to write a history of the AAEC, I initially thought that this would be little more than a dry organisational history with the scientific

struggles and achievements the only bright part of the of an otherwise mundane story. How wrong that initial thought proved. This history is anything but boring. In a nation so ordinary and as apparently open as Australia is, it is difficult to envisage any thought of Machiavellian intrigue. But the intrigue surrounding the functioning of the Commission would make the Borgias seem pedestrian. This intrigue does not come from the scientific community involved with research at the Commission but from the politicians, administrators and public servants who established their own agendas for the Commission and either failed to or chose not to communicate with those who were charged with the duty of carrying out their instructions.

I had also expected the story to be one of scientific achievement followed by some form of adulation but this too was not the case. Yes, there was scientific achievement, in fact Australia turned out to be the cradle from which the atomic age came into being. The Commission itself was also a hot house which nourished a number of young scientists who made contributions to the area of atomic energy but much of this achievement failed to come into the public eye. Their works were cited by overseas scientists, their creativity showed there was more than one way to develop a nuclear reactor and their practical sense also showed that radioisotopes had many uses beyond the laboratory bench.

But there has not been the adulation of those who brought all these achievements to the community. There has been no gratitude to those who devised methods by which diseases could be diagnosed through the use of scans employing radioisotopes and by which the environment could be monitored and polluting materials traced back to their sources by the use of radioactive tracers. Instead, in the final quarter of the Twentieth Century, many from within the community vilified those scientists who worked for the

Commission. There was an almost irrational fear amongst some within the community of all things nuclear. This fear then being vented on those who worked at the Commission.

This work will attempt to demonstrate how the Commission actually came into being and the forces; political, social and scientific, which helped shape the Commission. It will explore the relationship between science and government and it may seem that C.P.Snow's (1905-1980) conjecture of the two cultures[1] certainly existed here in Australia (and it may be argued still does to some extent). It will follow the major developments within the Commission set against the background of Australian politics in the second half of the Twentieth Century. However this work is an overview of the events the people and the discoveries that make up the history of the Australian Atomic Energy Commission. Due to its very nature it cannot be much more than that.

[1] Snow, C.P. 'The Two Cultures' Cambridge University Press, Cambridge 1959