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V. V. Krishna

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V. V. Krishna
University of Wollongong

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SCIENTISTS IN LABORATORIES: A COMPARATIVE STUDY ON THE ORGANISATION OF SCIENCE AND GOAL ORIENTATIONS OF SCIENTISTS IN CSIRO (AUSTRALIA) AND CSIR (INDIA) INSTITUTIONS.

A thesis submitted in fulfilment of the requirements for the award of the degree of

Doctor of Philosophy

from

The University of Wollongong

by

V.V. Krishna, B.Sc., M.A., M.Phil.

Department of Sociology
DECLARATION

This thesis is an original piece of research, the main content of which has not been previously submitted for a University Degree or other similar Award.

..................................................

V.V. Krishna
Dedicated to our first love - Neha
At the outset, I take this opportunity to express my sense of gratitude to my guru Professor Stephen Hill, who offered me the Post-Graduate Award Scholarship and who remained closest to the content of the thesis over the last five years. I am particularly grateful to Steve's guidance, support, freedom and moral encouragement he has afforded me both as a supervisor and friend in the completion of this thesis.

I wish to particularly thank the International Development Research Centre, Ottawa, Canada, which extended liberal support in awarding three grants: first, at the time of taking-up the scholarship (travel grant) at this university; second, for the field research (travel grant) trip to CSIR, New Delhi and CFTRI, Mysore; and finally, a scholarship grant for six months towards the end of my thesis preparation. I also wish to thank the University of Wollongong for providing additional grants during the course of my tenure at the University of Wollongong.

My special thanks to Jenny Braid of Kiama who spent nights and days in typing the drafts of my thesis. Without Jenny's help as a 'friend in need' this thesis would not have been completed at a stage when my eyes and feet were getting sore.

My friends, Ann, Trevor, Robin, Moira, Anita, Dodo and Bala have all extended support towards the completion of this thesis. I thank them, particularly Ann and Trevor. I also thank the Department of Sociology, The University of Wollongong for affording me the freedom and extending support during my tenure.

The empirical research in this thesis would not have been possible without the co-operation of scientists, both at the CFTRI and the FRL, who have provided me with valuable data for this thesis. I thank all of them.

Finally, I wish to thank the National Institute of Science, Technology and Development Studies, CSIR, New Delhi, for the great support - the institute has given me towards the completion of my thesis, by extending my study leave. I particularly wish to thank Professor A.Rahman, M.A.Qureshi and P.S.Nagpal, who have helped in many ways.

To Usha, Ankur, Shweta and my mother words are not necessary.
ABSTRACT

This thesis presents a comparative sociological investigation of the laboratory life-world of scientists. In particular, the thesis deals with the organisation of science and the ways in which the orientations of scientists and their research activity are structured in laboratories across national and cultural contexts.

Theoretically, the thesis employs a range of theoretical concepts drawn from general sociology, the sociology of knowledge, phenomenology, political sociology of science, symbolic interaction theory and the social history of science. The most influential theoretical stream that formed the basis for the action and meaning approach used in the analysis of science, is the 'interpretive' perspective drawn most centrally from the works of Schutz, Weber and Mannheim.

The theoretical framework developed in the first part of the thesis forms a coherent basis for the empirical investigation presented in the second part - through the methodology which is specifically developed to carry the 'interpretive' perspective of the theory into methodological assumptions and practice. The theoretical framework provides a basis for analysis of the action and meaning context of scientists within, and across two laboratory 'structures', as well as for analysis of interaction of the scientists with wider groups and agencies in the trans-laboratory and socio-historical contexts. The CFTRI/CSIR (in a non-Western culture context) and the FRL/CSIRO (in a Western culture context) formed the basis for empirical exploration through sixteen propositions drawn from the theory and the history of the laboratory case studies.

The field research conducted in this thesis involved the generation of a 'method of multiple feedback'. This method was generated as epistemological frame that aligned with the interpretationist frame of theory in the thesis. Following Mannheim, this method sought not only to observe - at "objective" level - from
without the subjective experience of scientists, but to draw the scientist-actor's own construction of expressive, evidential and objective meaning into the analysis of science in its institutional framework. This method involved the generation of data at five different levels of generality, employing feedback between these levels to form an overall interpretive synthesis of the relation between history, culture, politics, the scientific profession and the experience of scientist-actors.

The overall picture presented in this thesis reflects that scientific research and the action of scientists in laboratories are structured through a dynamic social process within particular social, political, cultural and historic contexts relative to the laboratory context.

On the basis of the theory and empirical research contained in the two case studies, the thesis demonstrates that scientists in CFTRI/CSIR and FRL/CSIRO are governed by two distinct traditions in research 'cultures' specific to the laboratory's national and cultural context. Towards the evolution of specific research 'cultures', the two laboratory organisations were found to be in constant negotiation with the socio-economic and political environment surrounding the institutions. Whilst the scientific research in CFTRI was found to be influenced by the utilitarian research 'culture' of CSIR, the research in FRL was observed to be highly influenced by the CSIRO 'culture' of excellence in scientific research. Correspondingly, the empirical research on the goal orientations of scientists in the two laboratory case studies, demonstrates that the meaning of research action is a product of the influences routed through the research 'cultures' extant in the respective laboratory's historic context.

The case studies contained in this thesis directly challenge the controversial assertion that 'science is universal and culture free'.

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