Scientists in laboratories: a comparative study on the organisation of science and goal orientations of scientists in CSIRO (Australia) and CSIR (India) institutions

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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
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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'.
CONTENTS

1. INTRODUCTION 1
   1.1 Overview of the Intentions of the Thesis 1
   1.2 Trajectory of the Thesis 10

2. SCIENCE IN THE CONTEXT OF ITS CONTEMPORARY SOCIAL THEORY AND PRACTICE: SOME RELEVANT THREADS TO THE PRESENT STUDY 15
   2.1 Introduction 15
   2.2 The Changing Nature of Science 16
   2.3 Critical Evaluation of Some Important Theoretical Concepts in the Sociology of Science 24
   2.4 Meaning and Interpretation as a Base for the Sociology of Science 38
   2.5 Conclusions 45

3. SOCIAL CONTROL IN SCIENCE: THE ROLE OF PROFESSIONALISM UNDER DIFFERENT FORMS OF OCCUPATIONAL CONTROL IN SCIENCE 51
   3.1 Introduction 51
   3.2 Professionalism and Occupational Control 52
   3.3 Professionalism and Collegiate Control 59
   3.4 Professionalism and Patronage Control 73
   3.5 Professionalism and Mediative Control 77
   3.6 Conclusion: Professionalism and Contextuality 82

4. ACTION AND MEANING CONTEXT OF SCIENTISTS IN THE LABORATORY 91
   4.1 Introduction 91
   4.2 Constitution of Meanings in Research 92
   4.3 Processes in Adult Socialisation 97
   4.4 Professional Orientational and Social Reference Groups 103
4.4.1 Research activity in a laboratory and its socio-historical context 122

4.5 Conclusions 129

5. METHODOLOGY 138

5.1 Introduction 138

5.2 The Process of Selection of the Laboratories for Case Studies 142

5.3 Specific Methodological Details Concerning the Empirical Research on Two Case Studies 143

5.4 The Method of Multiple Feedback 153

5.4.1 The theoretical basis to the method of multiple feedback 159

5.5 Indicators Used in the Construction of the Questionnaire and in the Description of the Goal Orientations of Scientists 162

5.6 Summary of the Organisation of Field Research and Techniques Used 165

6. INTRODUCTION TO THE CASE STUDIES AND CASE STUDY 1: SOCIAL AND HISTORICAL INFLUENCES ON THE CURRENT STRUCTURE AND FUNCTION OF SCIENTIFIC RESEARCH IN THE INDIAN LABORATORY - CFTRI/CSIR 168

6.1 The Purpose and Scope of the Case Studies Presented in this Thesis 168

6.1.1 Historical origins of CSIR and CSIRO 169

6.2 An Introduction to Case Study - 1: Brief History of CFTRI 182

6.3 Scientist - Political Leadership Nexus: Easy Alliance Between Science and Politics in the Context of CFTRI/CSIR 189

6.3.1 Position of CFTRI in the broader context of the CSIR system 200

6.3.2 Social and economic parameters for CFTRI's scientific research 212

6.4 Science for Social and Economic Development - a Utilitarian Principle in the Administration of Science at CSIR/CFTRI 218
6.5 Summary and Conclusions

7. CASE STUDY 2: SOCIAL AND HISTORICAL INFLUENCES ON THE STRUCTURE AND FUNCTION OF SCIENTIFIC RESEARCH IN THE AUSTRALIAN LABORATORY - FRL (CSIRO)

7.1 Introduction: Brief History of FRL

7.2 The Nexus Between Scientist - Political Leadership: An Uneasy Alliance Between Science and Politics in the Context of CSIRO

7.2.1 Position of FRL in the broader context of the CSIRO system

7.2.2 Food research - food industry interface

7.3 CSIRO 'Culture': The Principle of Scientific Excellence in Administering Scientific Research with an Emphasis on Basic Research at CSIRO/FRL

7.3.1 The case of FRL

7.4 Summary and Conclusions

7.5 Comparison Between the Indian and Australian Case Studies

7.6 Summary of Hypotheses

8. SCIENTISTS ACTION IN THE LABORATORIES: PRESENTATION OF THE DATA AND ITS ANALYSIS ON THE GOAL ORIENTATIONS OF SCIENTISTS IN CFTRI (INDIA) AND FRL (AUSTRALIA)

8.1 Introduction

8.2 Some Organisational Features Responsible for the Promotion of Strong Mission Orientation in Scientific Research at CFTRI

8.2.1 The mechanisms of planning in scientific research - system of research project selection

8.2.2 Industrial development and consultancy services (IDCS)

8.2.3 The reward system

8.3 Some Organisational Features Responsible for the Promotion of Basic Research at FRL
8.3.1 The system of research projects selection and execution 369
8.3.2 The reward system 373
8.3.3 Liaison and extension group 376

8.4 The Goal Orientations of the CFTRI and FRL Scientists: Results of the Data from Factor Analysis 381
8.4.1 The research settings and the sample of scientists 381
8.4.1.1 The questionnaire and measures 385
8.4.2 The data analysis on the goal orientations of scientists and scientific assistants in the FRL and CFTRI 390
8.4.2.1 Results and interpretation of the factors (scientists and scientific assistants) 395
8.4.3 The goal orientations of scientists in the FRL and CFTRI 402
8.4.4 The goal orientations of scientific assistants in the FRL and CFTRI 410
8.4.4.1 Results and interpretation of the factors (scientific assistants) 411

8.5 Analysis of Variance on the Goal Orientations of Scientists in FRL and CFTRI 425
8.5.1 Results of the one way analysis of variance on the research productivity of scientists in FRL and CFTRI 431

8.6 The Goal Orientations of Scientists Through the Analysis of Research Projects and the Productivity Research in FRL and CFTRI: Further Support to 8.4 434
8.6.1 Results of the analysis made on the research projects and the productivity of scientists in the FRL 440
8.6.2 CFTRI 454

8.7 Goal Orientations of Scientists in the Context of the Theory: CFTRI and FRL - Some Comparisons 465

8.8 Conclusions 478
9. SUMMARY AND GENERAL CONCLUSIONS 486
   9.1 Introduction 486
   9.2 Summary 488
      9.2.1 Part I: Theoretical framework 488
      9.2.2 Part II: Methodology and case studies 498
   9.3 General Conclusions 514
   9.4 Suggestions for Future Work 521

APPENDICES 523

BIBLIOGRAPHY 580