

# Contents

<i>List of Figures</i>	vii
<i>List of Tables</i>	ix
<i>Notes on the Contributors</i>	x
<i>Acknowledgements</i>	xiii
<i>Glossary</i>	xvi

## PART I INTRODUCTION

1 How to Study the Force of Science <i>Michel Callon, John Law and Arie Rip</i>	3
--	---

## PART II THE POWER OF TEXTS IN SCIENCE AND TECHNOLOGY

2 The Sociology of an Actor-Network: The Case of the Electric Vehicle <i>Michel Callon</i>	19
3 Laboratories and Texts <i>John Law</i>	35
4 Writing Science – Fact and Fiction: The Analysis of the Process of Reality Construction Through the Application of Socio-Semiotic Methods to Scientific Texts <i>Bruno Latour and Françoise Bastide</i>	51
5 The Heterogeneity of Texts <i>John Law</i>	67
6 Mobilising Resources Through Texts <i>Arie Rip</i>	84

## PART III MAPPING SCIENCE AND TECHNOLOGY

- 7 Qualitative Scientometrics 103  
*Michel Callon, John Law and Arie Rip*
- 8 Aquaculture: A Field by Bureaucratic Fiat 124  
*Serge Bauin*
- 9 State Intervention in Academic and Industrial Research: The  
Case of Macromolecular Chemistry in France 142  
*William Turner and Michel Callon*
- 10 Pinpointing Industrial Invention: An Exploration of  
Quantitative Methods for the Analysis of Patents 163  
*Michel Callon*
- 11 Technical Issues and Developments in Methodology 189  
*Jean-Pierre Courtial*
- 12 Future Developments 211  
*Michel Callon, Jean-Pierre Courtial and William Turner*

## PART IV CONCLUSION

- 13 Putting Texts in Their Place 221  
*Michel Callon, John Law and Arie Rip*
- Bibliography* 231
- Index* 239

# List of Figures

2.1	The anatomy of the EDF actor-world	29
3.1	Blood clearance of $^{125}\text{I}$ -labelled copolymers 29–32	44
3.2	Body distribution of radioactivity sixty minutes after intravenous injection	45
4.1	Turnover, with time, of water and sodium in the different regions of the kidney	55
5.1	The elementary form of interessement	72
5.2	Linked translations or the funnel of interests	79
7.1	An article as a network of powerful words	106
7.2	The network of problematisations around a single paper	109
7.3	The network of problematisations in an area of science	109
7.4	Visual representation of inclusion index	113
7.5	Hierarchical relationship between problematisations as depicted by inclusion index	113
7.6	Clusters of problematisations as generated by the proximity index	115
7.7	Visual representation of proximity index	115
7.8	Inclusion map for dietary fibre research, 1973–6	118
7.9	Inclusion map for dietary fibre research, 1977–8	119
7.10	Proximity map of aquaculture, 1979	120
7.11	Proximity map of breeding and cultivation cluster	121
8.1	Inclusion map (detail), 1979	126
8.2	Main central and mediator words, 1979	127
8.3	Main central and mediator words, 1981	128
8.4	Detail from 1979 inclusion map ( <i>Salmo gairdneri</i> )	128
8.5	Detail from 1979 inclusion map (algae)	129
8.6	Detail from 1979 inclusion map (artificial feeding)	130
8.7	Detail from 1981 inclusion map (artificial feeding)	132
8.8	Proximity map, 1979	133
8.9	Proximity map, 1981	134
8.10	Feeding and nutrition cluster, 1979	134
8.11	Feeding and nutrition cluster, 1981	135

8.12	Pathology and diseases cluster, 1979	136
8.13	Pathology and diseases cluster, 1981	137
8.14	Breeding and cultivation cluster, 1979	138
8.15	Breeding and cultivation cluster, 1981	139
9.1	Principal research themes adopted by the DGRST	143
9.2	The position of DGRST problem areas in the general industry/university network of problematisation	150
9.3	Links between problems and central poles	158
10.1	Inclusion map, 1980, central poles and passageways	165
10.2	Inclusion map, 1981, central poles and passageways	167
10.3	Zoom on 'enzyme', 1980	169
10.4	Zoom on 'enzyme', 1981	172
10.5	Proximity map, 1980, (a) first component, (b) second component, (c) third component, (d) fourth component	174-5
10.6	Proximity map, 1981, (a) first component, (b) second component, (c) third component	177
11.1	Detailed graph and skeleton graph of part of the dietary fibre graph	194
11.2	Stability of skeleton when threshold of $I$ is lowered	196
11.3	How an additional link (CD) decreases the total number of links in the skeleton graph	197
11.4	Skeleton graph of the dietary fibre file, 1973-8	200
11.5	Skeleton graph of dietary fibre file, re-indexed to reduce variety of descriptors	202
11.6	Elementary patterns of key-word networks	204
11.7	Laboratories in the dietary fibre field	208

# List of Tables

4.1		56
9.1	The distribution of interests identified in the proposals submitted to the DGRST	152
9.2	Dominant centres of interest in three documentary sources	154
9.3	The role played by different partners of the DGRST Concerted Action Programme in positioning research problems with respect to general socio-economic objectives	159
10.1	Patents indexed in 1981 by at least two of the three words: 'glycerol', 'triglyceride', 'enzymatic method'	178
10.2	Patents indexed in 1981 by 'submerged culture'	180-1
10.3	Patents indexed in 1980 by at least one of the four words: 'actinomycece', 'streptomyces', 'molecular structure' ( <i>structure moléculaire</i> ) 'anti-tumoral' ( <i>anticancereux</i> )	182-3
10.4	List of key-words with frequencies in brackets	185
10.5	Key-word contents of Merck patents	186
11.1	Correspondence analysis: dimensions that account for 50% of variance	191
11.2	Number of key-words and links constituting the skeleton when threshold of <i>I</i> is lowered	195
11.3	Sorting articles by mediator words	206
11.4	Example of an article exhibiting a rare combination of mediator words	207
11.5	Activity profile of countries, measured by number of articles falling under different mediator words (in percentages of number of classified articles per country)	209