

# Critiques of Knowing

Situated textualities

in science, computing and the arts

Lynette Hunter



**Also available as a printed book**  
see title verso for ISBN details

# Critiques of Knowing

'Reading *Critiques of Knowing* is like looking into a kaleidoscope, where bright fragments are set in mirrors and new and beautiful patterns form. One of my special pleasures in reading her are the delicious asides; these are very light, very fast, Lynette Hunter makes some devastating theoretical reflections, and the text races down the page.'

Hilary Rose, author of *Love, Power and Knowledge*

'*Critiques of Knowing* is a book of extraordinary intellectual breadth and depth.... I know of no other book which brings together this astonishing range of currents to weave together a critique of such a large part of our contemporary intellectual culture.'

Alison Adam, author of *Artificial Knowing*

'*Critiques of Knowing* is a highly original text.... I know of no other book of feminist epistemology which spans such wide-ranging disciplines.'

Gill Kirkup, The Open University

'This is a book that is thoroughly engaged with on-going debates in a range of interconnected topics.... It makes a distinctive contribution to current debates and will, no doubt, generate further debate.'

Sarah Hutton, President of the British Society for the History of Philosophy

'This erudite, elegantly written book engages provocatively with questions at the forefront of scholarship in the humanities at the end of the twentieth century.'

Lorraine Code, York University

**Lynette Hunter** is Professor of the History of Rhetoric at the University of Leeds. She worked for a number of years as a biochemist and laboratory technician, and has recently become widely known for her performance art lectures. Hunter has published in the fields of critical theory, feminism, literary criticism, rhetoric and the history and philosophy of science. Her books include *Rhetorical Space*, *Modern Allegory and Fantasy*, *Outsider Notes: Feminist Approaches to Ideology*, *Writers/ Readers and Publishing*.



# **Critiques of Knowing**

Situated textualities in science,  
computing and the arts

**Lynette Hunter**



London and New York

First published 1999  
by Routledge  
11 New Fetter Lane, London EC4P 4EE

This edition published in the Taylor & Francis e-Library, 2002.

Simultaneously published in the USA and Canada  
by Routledge  
29 West 35th Street, New York, NY 10001

© 1999 Lynette Hunter

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

*British Library Cataloguing in Publication Data*

A catalogue record for this book is available from the British Library

*Library of Congress Cataloguing in Publication Data*

Critiques of Knowing: situated textualities in science, computing and the arts: Lynette Hunter

Includes bibliographical references and index.

1. Knowledge, Theory of. 2. Science—Philosophy. 3. Artificial intelligence. I. Title.

Q175.32.K45H86 1999

98-30839

121-dc21

CIP

ISBN 0-415-19256-0 (hbk)  
ISBN 0-415-19257-9 (pbk)  
ISBN 0-203-01222-4 Master e-book ISBN  
ISBN 0-203-20317-8 (Glassbook Format)

# Contents

<i>Acknowledgements</i>	<i>vi</i>
Introduction	1
1 The ethos of the nation state: ideology, discourse and standpoint	8
2 Rhetoric and artificial intelligence: computing applications in the sciences and humanities	28
3 AI and representation: a study of a rhetorical context for intellectual legitimacy	61
4 The socialising of context: methodologies for hypertext	86
5 Feminist critiques of science: from standpoint to rhetorical stance	124
6 A feminist critique of the rhetorical stance of contemporary aesthetics: alternative standpoints	162
<i>Notes</i>	<i>196</i>
<i>Bibliography</i>	<i>222</i>
<i>Index</i>	<i>239</i>

# Acknowledgements

Books come from collaborations, and this one from work on common ground to build several diverse communities. The thread through all of them has been my partner Peter Lichtenfels, and our two sons Andrew and Alexander, who have, literally, grown up alongside the development of many of these ideas. Building common ground usually means changing what was there before, and it's never easy, but these people have kept me honest and shown a remarkable taste for the uncertainties of exploration. This book is infused with their perception and I thank them with all my heart.

It is quite possible that the book wouldn't have happened at all were it not for Elizabeth Paget who carefully and with great tact helped me over many years prepare the various parts of the text for publication. I am grateful to her, and to Stephen Morton who compiled the index with exceptional skill and an uncanny knack for reading the categories of someone else's mind. Gresham College, where I currently hold the Professorship in Rhetoric, has been generous with financial help for moulding the book into its present shape. I also benefited from the Women's Studies visiting lecture programme at Dalhousie University and a three week University of Leeds exchange fellowship with the universities of Alberta, which allowed me to complete the final draft.

There are so many people in the diverse communities that emerged from writing and reading—the bibliography is the only approximate guide to those whom I should thank. At the same time I would like in particular to thank those who read parts of the manuscript, Margaret Beetham, Bryan Cheyette, Sarah Hutton, Rick Jones, Peter Lichtenfels, Jerry Murphy, Hilary Rose, Stephen Rose, Jan Swearingen, John O. Thompson; and Lesley Johnson with whom I discussed many aspects of the book. I would also like to thank a number of groups: the scientists I worked with including Drs Eidinger, Hall, Rahtz, Smith; Lydia and Bill from McMaster University; the Royal Edinburgh Infirmary; the computer scientists and computer service staff at the universities of Wales, Edinburgh, Oxford and Leeds; the intellectually challenging world of the International Society for the History of Rhetoric; my co-workers on the nineteenth century domestic bibliographies, Dena Atter and Elizabeth Driver, and on the Victorian

Periodicals Project; and the inspirational feminist community at the University of Calgary. My friends and colleagues teaching commonwealth and postcolonial literatures at the University of Leeds, under the direction of Shirley Chew, have provided a peculiarly apt location for the situated knowledge of this text and its critique.



# Introduction

This book will attempt to offer a study of textuality, particularly in the sciences and artificial intelligence in computing science which has cast itself in the role of a discipline which self-consciously examines the way that science represents knowledge. Textuality allows us to explore the ways we represent aspects of our lives within conventional systems. It also helps us understand how we articulate values that do not have representation. Like knowledge, textuality is bound into power, for textuality is both a mode of knowing and the way we articulate knowledge.

Knowledge and textuality are usually taken as neutral areas by analyses that work within an institutional structure that obscures the connections with ruling power. This is what I call the ideology-subject axis, which I explore in detail in Chapter 1, and an understanding of its rhetoric lies at the centre of my argument and my understanding of the recent development in standpoint theory of a concept of critical realism. Within systems of inquiry that foreground particular connections with ruling power, such as many discourse studies, knowledge and textuality are often taken as determined or constructed or constituted by an ideological system. These studies, implicitly at least, depend on the notion of a constituted subject, and some, with extraordinary insensitivity and blindness have come to define those people outside of the system as 'object'. However, within the theory of situated knowledge and in standpoint theory, knowledge and textuality are taken as engaged in by groups of people working on negotiating questions of value and action among relations of non-ruling power, and between the non-ruling and the ruling.

In the process of studying the place of textuality within science, I am also concerned to look at what I call the 'gesture to the arts' made by both mainstream and standpoint critiques, and to explore the place of textuality in a number of disciplines. The final chapter of the book extends the standpoint critique in feminist science and technology studies into aesthetics. The insistent gesture to arts strategies of beauty or plurality as a possible resolution for science, does not understand that much recognised 'art' is just as systematic as science, that 'beauty', like the 'success' of science, is also an artefact. But aesthetics is also a field that is tied to the Greek root of the word, to

'feelings', which are generated by all disciplines, and I would agree with Alison Jagger that emotions or feelings are often unauthorised modes of knowing: the 'rational', for example, being an authorised emotion. Aesthetics and epistemology are closely intertwined, for without articulation knowledge remains tacit, and the main focus of the extension of standpoint theory into aesthetics, is to argue for an understanding of 'situated' textuality, analogous to situated knowledge. Situated textualities are where people work on words together to build common ground for the articulation and valuing of knowledge, and to argue for them I draw not only from contemporary social history of science but also from the history of rhetoric.

Standpoint theory argues that knowledge articulated from the standpoint of those excluded from ruling relations of power is particularly important. Because of the exclusion, the knowledge that is offered from that excluded position is quite different to that current within the ethical and ideological systems of a society and its culture, and is therefore a source of assessment and potential change and renewal. The theory is concerned with articulating situated knowledge, with retaining a concept of the real in the sense of critical rather than naive realism, and with re-defining the 'individual' to account for people who are not subjects, or to account for the not-subjected of people's lives. It is important to say, however, that situated textuality and standpoint theory are not special case strategies. All forms of knowledge may be analysed in these terms.

In science, where standpoint has been explored at length, there is in recent debate and as the later chapters discuss, a critique of scientific objectivity based on its self-limitation resulting from the exclusion of, among other things, women's knowledge. In politics, there have been critiques of the curious doubleness of the autonomous yet universalist man constructed by the liberal democratic social contract, because the necessary isolation of that individual obscures the situatedness of their lives. In philosophy, we find the critique of value-free assumptions in both empiricism and idealism, because the notion of 'value-free' denies history. And in the social sciences, there has been the debate between quantitative and qualitative methodology, the latter arguing that verisimilitude, repeatability and enumeration evade the contextual pressures of living.

In each case, the obscured, evaded, denied, excluded situated knowledge is without authority, often if not usually, without words. The critiques delineate tacit knowledge of various kinds, and all recognise the need to work on words to bring those tacit knowledges into communication. In nearly every case the pathway out toward agency that the critiques offer, is through story, narrative or poetics, yet there is no parallel critique of the aesthetic constraints on these materials. The result is a philosophical hiatus that gestures toward the arts but with no concept of the situated textuality needed to articulate situated knowledge, its contexts and its value.

Rhetoric is a field that insists on the bringing together of textualities, society and politics. It has traditionally been concerned with social context, and has always distinguished between the situated, the systematic and the authoritarian. It is also concerned with different approaches to truth: truth as certain, as plausible and as negotiated or probable. And rhetoric is also concerned with the ways individuals and groups wield power, the ways they limit and extend the possibilities of human interaction. Throughout the book I turn to writings on rhetoric from the classical period, and particularly to the texts on rhetoric by Plato and Aristotle. Much of the elaboration of the political structure of democracy is bound up in those rhetorics, as is the development of epistemology and attitudes to value. This infusion of the classical throughout many discourses has led to virtual images of Plato and Aristotle that are formed in each historical place and time, answering to its needs. All of the ensuing discussions return to these classical texts, partly to help dismantle unhelpful screens in earlier metadiscourses, and partly to rebuild alternative versions more appropriate to today. Much of my reading of Plato and Aristotle affirms and lends rhetorical weight to situated knowledges and standpoint theory. In bringing a refreshed tradition to a contemporary need articulated in feminist theory, the rhetorical analysis also moves the theory from epistemology into aesthetics, both in my critique of the aesthetics of different disciplines and in my exploration of different kinds of textuality: textuality as inadequate and hence merely a code, textuality as (in)adequate and hence transgressed and transcended, and textuality as necessarily limited by the materiality of language and therefore the ground for common work on words.

Standpoint theory comes close to discourse studies in many of its concerns, yet the concern for critical realism separates the two. Discourse studies are profoundly caught up in the constitution of social systems, and find it difficult to deal with the notion of the 'real', for reality is messy and requires that systems relax and get snarled up in the nets of living. Yet each does vital work: standpoint theory in its focus on non-ruling relations, and discourse studies in their focus on the constraints of ruling power that constitute individuals. To distinguish between ruling and non-ruling relations, is to distinguish between areas that need different kinds of rhetoric, that manifest themselves not only in different kinds of knowledge but also in different kinds of textuality. And explicit through the book is the political context of the liberal democratic social contract that underwrites the dominant modes of knowledge and textuality with which I live, and which it mediates through the rhetoric of the ideology that represents many western nation states to their subjects.

The first chapter of this book analyses the ideology-subject axis and its rhetoric, in order to assess the connections of knowledge and textuality with ruling power. I argue that ideology is the ethos of the nation state. The strategies of this ideology are common to plausible rhetoric as defined throughout the history of recorded rhetorics. They include: the assumption

of common grounds rather than active discussion and agreement to them; the veiling, hiding and obscuring of the constructed status of these common grounds; the isolation of the system to protect grounds from question and change; and the procedure of arguing always within the system, always from the accepted common grounds. When one knows that this set of strategies is happening, the rhetoric can be recognised as an expedient rhetoric that is often successful.

At the centre of the rhetorical stance of ideology is the assumption that representation can be adequate to a lived reality rather than a set of negotiations around the limitations of language. It implies that communication, here political communication between the individual and ruling power, cannot be negotiated differently, only shifted to greater adequacy. The practice of this assumption develops into the concept of the isolated, autonomous subject, increasingly constituted by ideology as the state acquires the stability necessary to its legitimisation. Further, as it develops stable representations, it leads to a focus on visual accuracy and repeatability that underwrites the concept of objective knowledge. The ideology of the nation state is common to both politics and science.

A constant thread through all the chapters, is the recognition that much recent political theory takes science as the 'best-case' for politics. And, as I examine in detail in the last two chapters of the book, feminist standpoint theorists in the social studies of science offer direct critiques of the political systems that support it. Science is appealing to analysts of the representative democratic state, since it works with a stable set of parameters that enclose its grounds, isolate its community and allow it to be subject to a rational logic that achieves its success by gaining legitimisation from the structures of the system that generates it. Hence issues of legitimisation, and how science or political systems justify themselves to their constituents, become central. Modern science has achieved this stable state through increasing involvement in industry and in commerce that need stable technology to maximise profit. Industry and commerce also need stable politics, and since the seventeenth century capitalist nation states have achieved this stability through ideology. Chapter 1 outlines the rhetorical stance of ideology, which stabilises the representation of those in power as well as the identity of individual citizens who become subject to that power. I argue that the stance purposively excludes some social relations and most communities in order to remain stable, and constructs an axis of representation, relating ideology to the subject.

Aristotle describes exactly this phenomenon of communication in his discussion of the rhetoric appropriate to 'science', by which he means the conceptual knowledge developed within a small group of people, rather than an experimental method that could be used by many. He spells out the strategies and devices that are used to construct stability and repeatability, but he also says that such rhetoric is not appropriate to social interaction because it is enclosed, and hence obstructs negotiation and the discussion of differences necessary to political action. Hence expedient rhetoric aimed

at success is not appropriate for politics because of its potential for coercion, demagoguery and force. What is interesting is that with the development of ideology in the modern period of western history, politics assumes a rhetorical structure similar to that of Aristotelian ‘science’, and for the same reason. For three centuries, the politics of western liberal democracies was a club culture, with an extremely small proportion of the population representing a slightly larger number, ruling the whole, inevitably from their own experience and regretfully in their own interests because there were no permitted competing views. Aristotle was not so worried about this because the dominance of the oral medium meant, to him, that the powerful would not stay long in power. But the rhetoric does not work out that way in a period of nation state consolidation with capital, and with the print media and other technologies distancing discussion and stabilising representation.

Central to the argument of this book is that both ideology as representative of the state, and the language that represents scientific practices, use similar rhetorical strategies and devices but for different reasons. The experimentation at the heart of modern science, which has come to define the ‘natural sciences’, is in effect the primary medium of scientific textuality and should locate its aesthetics. But in conveying the activity of that textuality, science uses language to communicate to other people. However, modern science developed during an historical period when theories of language were attempting, unsuccessfully, to achieve full adequacy to the real, and since language is always different to reality, it appears always to be inadequate. The response of science to this dilemma, which is discussed at length and in detail by scientists during the seventeenth and eighteenth centuries, is to use verbal language as a code, and to employ mathematical language, which of course appears to be more exact because it operates wherever possible within a predefined terrain. Other scientists can understand that there is a real world with which the experiment engages, but for the large part of the population which is unfamiliar with experiment, the second-order code of language is the reality of science.

In Chapter 2, I argue that today, this understanding of science is exacerbated by the recent development of computing science and particularly of artificial intelligence (AI). Neither computing science nor AI deal immediately with the natural world; they are, not surprisingly, often linked with mathematics and philosophy. However, the rhetoric of the textuality of computing mimics that of the second-order code of science and takes language as inadequate to reality. The widespread use of computers throughout the modern nation states of Europe, North America, Australia and Japan, at the least, has given weight and practice to this understanding of science. Hence also, many analyses from political philosophy, in their reference to the scientific model of language and rhetoric, are taking an artefact as a best-case example. They tautologically use an ideological structure to justify the structure of ideology. By way of a rhetorical analysis of the textual representations

that science uses, most distinctively demonstrated in computing science and especially in AI, Chapters 2–4 offer a critique of the techniques frequently used for representing what science does. At the same time, using the example of humanities computing, these chapters study the pervasiveness of the belief that these techniques are indeed what science has to offer. The commentary suggests that the persuasion is particularly effective when adopted by the arts and humanities where textuality is not used as second-order code but as primary material, albeit within an aesthetic system which also treats language as (in)adequate and strives always to transgress or transcend it. It has to be said that many people working in the arts and humanities have rejected computing precisely because it mimics the set of epistemological conditions that they challenge, but with hypertext, which seems to offer different strategies, some of that resistance has begun to break down.

The third chapter turns to a study of what mainstream philosophy of science that is concerned with computing and AI, says about the representations used by science. The argument here suggests that these philosophers of science, with a few exceptions, underwrite a notion of textuality that explicitly draws on the (in)adequacy of language and results in representation either as second-order code or as transcendence/transgression. These philosophers also frequently gesture to beauty or plurality as a possible resolution for science, and do not understand that much recognised ‘art’ is just as systematic as science. However, this misunderstanding is not surprising, since many critics and intellectuals who comment on art do not themselves recognise the systematic structure of ‘beauty’ nor the ideological construction of plurality. Indeed the one is frequently offered as a resolution to the other, in an essentialist-relativist standoff that is redoubled by political and aesthetic debates about authenticity as identity politics as against multiculturalism.

Chapter 4 works from a rhetorical critique of dominant theories of language and textuality as (in)adequate, to suggest that there are different kinds of first-order textuality or textuality as primary material, and that the different textualities posit different kinds of legitimating practices for knowledge, different ways for people to represent value and to value representation. The critique returns to computing and to a case study from hypertext methodology to emphasise that no technique is enclosing, isolating and reductive, or exploratory, contextualising and flexible, in itself; nor is either authenticity or self-reflexiveness in itself enabling. Communicative texts from all disciplines need a rhetorical analysis of stance, which will position the techniques and strategies historically, politically and socially. Such an analysis situates the textuality, and in doing so situates the knowledge.

The concept of language as (in)adequate to the real is also central to theories of aesthetics and criticism in the post-Renaissance period. Chapters 5 and 6 move through a standpoint critique of science to a critique of aesthetics. Within the modern nation state, the artist is cast as the allowed or permitted transgressor of ideological enclosure, and intellectuals or critics are those who articulate to the state the kind of transgression being enacted. Art itself

is perceived to be activity that attempts to transcend the inadequacy of ideological limitation. In doing so it produces beauty as it wrests some element of social reality from ideological obscuring into cultural articulation. At the moment of articulation such work produces intense joy, and partly because it sits so neatly into the interstices of ideology it is often called 'truth'. Yet none of these designations account for the personal and individual work on words and other media carried out by artists. As I argue in Chapter 5, these designations are critical theories of reception and intervention by and for an art that is produced by licensed citizens of the nation state.

What is missing from these critiques, and what this book will move toward, is a critique of the critical and aesthetic discourses for talking about communication, textuality and the arts generally. Without a standpoint critique of the arts, the gesture toward art's strategies made by commentators working in other areas, implicitly takes all those strategies as a good thing, whereas anyone working in the arts knows that some are more appropriate than others. Furthermore, on the whole, the arts themselves are uncritical about the way they present themselves to the public, and without a better understanding of what the arts do in terms of textuality, the understanding of situated knowledge will come to a standstill.

Without an understanding of rhetorical stance and the situatedness of textuality, standpoint can and has been dismissed as identity politics. Yet with a concept of situatedness that rhetoric can offer both to knowledge and text (and to other areas beyond the scope of this book, such as sexuality), personal experience can be positioned with respect to conversation, decision, action and value, within specific groups of people having specific needs. A rhetorical understanding of that situatedness also makes it possible for communities to negotiate with other communities in a larger political field.

Rhetoric argues that language is inexorably different to the real world, which is why language has to be worked on in specific contexts of negotiation over communication or in situated textualities. As a result, I present this analysis as one also based on my own experience as a practising biochemist from 1968–78, as a humanities computing teacher and user from 1980–95, and as a writer and artist all my remembered life. The structure of the book is interspersed with stories, anecdotes and accounts of my personal engagement with these disciplines. The interspersals are at first abrupt as they erupt through the density of memory, and are most fully told in the final chapter. There I speak about my current teaching, in which, with the help of others, I try to educate other people in strategies for conversation and common action with other texts, other knowledges and other people, of quite different needs and positions. The concluding discussion begins to ask what science and computing might be like, what the recognised arts might be like, and indeed what politics might be like, if they engaged more substantially with rhetorical negotiation, probability and community.



# Bibliography

- Aaron, J. and Walby, S. (eds) (1991) *Out of the Margins: Women's Studies in the Nineties*, London: The Falmer Press.
- Adorno, T. (1982) *Against Epistemology: A Metacritique*, Oxford: Blackwell.
- Althusser, L. (1971) 'Ideology and ideological state apparatuses (notes towards an investigation)', in *Lenin and Philosophy and Other Essays*, trans. B. Brewster, London: New Left Books.
- Anzaldúa, G. and Moraga, C. (eds) (1981) *This Bridge Called My Back: Writings by Radical Women of Colour*, Watertown MA: Persephone Press.
- Angenot, M. (1988) 'Social discourse analysis: outlines of a research project', *Discourse Social/Social Discourse*, 1:1.
- Apetheker, B. (1989) *Tapestries of Life: Women's work, women's Consciousness, and the Meaning of Daily Experience*, Amherst MA: University of Massachusetts Press.
- Arendt, H. (1975/1951) *The Origins of Totalitarianism*, New York: Harcourt Brace Jovanovitch.
- Aristotle (1984) *The Complete Works of Aristotle*, revised Oxford translation, ed. J. Barnes, Bollingen Series LXXI vols 1 and 2, Ithaca NY: Princeton University Press.
- Attar, D. (1987) *Household Books Published in Britain, 1800–1914*, ed. L. Hunter, London: Prospect Books.
- Austin, J. (1962) *How to Do Things with Words*, Oxford: Clarendon Press.
- Bacon, F. (1974) *The Advancement of Learning*, in *Works of Bacon*, VI, Oxford: Clarendon Press.
- Bauman, Z. (1989) *Modernity and Ambivalence*, Oxford: Polity Press.
- (1992) *Intimations of Postmodernity*, London: Routledge.
- Bazerman, C. (1988) *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*, Madison WI: University of Wisconsin Press.
- Beeman, W. et al. (1989) 'Hypertext and pluralism: from lineal to non-lineal thinking', *Proceedings of Hypertext '87*.
- Beetham, D. (1991) *The Legitimation of Power*, London: Macmillan.
- Beetham, D. and Boyle, K. (1995) *Introducing Democracy: 80 Questions and Answers*, Cambridge: Polity Press/UNESCO.
- Beetham, M. (1996) *A Magazine of her Own: Domesticity and Desire in the Woman's Magazine 1800–1914*, London: Routledge.



- (1990) 'Towards a theory of the periodical as a publishing genre', in Brake, L., Jones, L. and Madden, L. (eds) *Investigating Victorian Journalism*, London: Macmillan.
- Belenky, M.F., McVicker, C.B., Goldberger, N.R. and Tarule, J.M. (1986) *Women's Ways of Knowing: The Development of Self, Voice and Mind*, New York: Basic Books.
- Benhabib, S. (1992) 'The generalized and the concrete other', in Fraser, E., Hornsby, J. and Lovibond, S., *Ethics: A Feminist Reader*, Oxford: Blackwell.
- Benjamin, A., Cantor, G. and Christie, J. (eds) (1987) *The Figural and the Literal: Problems of Language in the History of Science and Philosophy, 1630–1800*, Manchester: Manchester University Press.
- Bergendahl, G. (1990) 'Professional skill and traditions of knowledge', in Goranzon, B. and Florin, M. (eds) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- Berlin, B. (1977) 'Speculations on the growth of ethnobotanic nomenclature', in Blount, B. and Sanchez, M. (eds) *Socio-cultural Dimensions of Language Change*, London: Academic Press.
- Bernstein, R. (ed.) (1985) *Habermas and Modernity*, Cambridge: Cambridge University Press.
- Birnbaum, L. (1991) 'Rigor mortis: a response to Nilsson's "Logic and artificial intelligence"', *Artificial Intelligence*, 47.
- Black, W. (1986/7) *Intelligent Knowledge-based Systems*, Wokingham: van Nostrand Reinhold.
- Bock, G. and James, S. (eds) (1992) *Beyond Equality and Difference: Citizenship, Feminist Politics and Female Subjectivity*, London: Routledge.
- Boden, M. (1989a) 'Artificial intelligence: opportunities and dangers', in Murray, L. and Richardson, J. (eds) *Intelligent Systems in a Human Context: Development, Implications, and Applications*, London: Oxford University Press.
- (1989b) 'The meeting of man and machine', in Murray, L. and Richardson, J. (eds) *Intelligent Systems in a Human Context: Development, Implications, and Applications*, London: Oxford University Press.
- (1990) 'Artificial intelligence and images of man', in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Bolter, J. (1984) *Turing's Men: Western Culture in the Computer Age*, Chapel Hill NC: University of North Carolina Press.
- Booth, W. (1974) *A Rhetoric of Irony*, Chicago IL: University of Chicago Press.
- Boyce, G., Curran, J. and Wingate, P. (eds) (1978) *Newspaper History from the Seventeenth Century to the Present Day*, London: Constable.
- Braidotti, R. (1992) 'On the female feminist subject, or: from "she-self" to "sheother"', in Bock, G. and James, S. (eds) *Beyond Equality and Difference: Citizenship, Feminist Politics and Female Subjectivity*, London: Routledge.
- Brooks, R. (1991) 'Intelligence with representation', *Artificial Intelligence*, 47, 1991.
- Brown, V. (1994) *Adam Smith's Discourse: Canonicity, Commerce and Conscience*, London: Routledge.
- Burnard, L. (1985) *Famulus Users' Manual*, Oxford University Computing Service.
- Burrows, J. (1986a) *Computation into Criticism*, Oxford: Clarendon Press.

- (1986b) 'Modal verbs and moral principles', *JALLC*, 1:1.
- (1987) 'Word patterns and story shapes: the statistical analysis of narrative style', *JALLC*, 2:1.
- Butler, J. (1993) *Bodies that Matter: On the Discursive Limits of 'Sex'*, London: Routledge.
- Canovan, M. (1992) *Hannah Arendt: A Reinterpretation of her Political Thought*, Cambridge: Cambridge University press.
- Cantor, G. (1989) 'The Rhetoric of experiment', in Gooding, D., Pinch, T. and Schaffer, S. (eds) *The Uses of Experiment: Studies in the Natural Sciences*, Cambridge: Cambridge University Press.
- Cave, T. (1988) *Recognitions: A Study in Poetics*, Oxford: Clarendon Press.
- Charney, D. (1989) 'Comprehending non-linear text: the role of discourse cues and reading strategies', *Proceedings of Hypertext '87*.
- Charniak, E. and McDermott, D. (1985) *Introduction to Artificial Intelligence*, Wokingham: Addison Wesley.
- Charolles, M. (1990) 'Logistic analysis and discourse analysis', in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Christensen, K. (1986) 'Technological decisions are moral decisions', in Geiss, G. and Viswanathan, N., *The Human Edge: Information Technology and Helping People*, New York: Haworth Press.
- Churchland, P.M. and Churchland, P.S. (1990) 'Could a machine think?', *Scientific American*, 262:1.
- Cicourel, A. (1964) *Method and Management in Sociology*, London: Macmillan.
- Clancey, W. (1992) 'Model construction operators', *Artificial Intelligence*, 59.
- (1993) 'Notes on "heuristic classification"', *Artificial Intelligence*, 59.
- Code, L. (1995) *Rhetorical Spaces in Gendered Locations*, London: Routledge.
- Code, L., Ford, M., Martindale, K., Shewin, S. and Shogan, D. (1991) *Is Feminist Ethics Possible?*, Ottawa: CRIAW/ICREF.
- Collins, P.H. (1990) *Black Feminist Thought: Knowledge, Consciousness and Politics of Empowerment*, London: Harper Collins Academic.
- Connerton, P. (1989) *How Societies Remember*, Cambridge: Cambridge University Press.
- Cooley, M. (n.d.) *Architect or Bee? The Human/Technology Relationship*, comp. and ed. S.Cooley, Slough: Hand and Brain Publications.
- (1987) 'Creativity, skill and human-centred systems', in Goranzon, B. and Josefson, L. (eds) *Knowledge, Skill and Artificial Intelligence*, London: Springer Verlag.
- (1988) *Cognitive Science and its Applications for Human Computer Interaction*, London: Lawrence Erlbaum Associates.
- Cook-Gumperz, J. (ed.) (1986) *The Social Construction of Literacy*, London: Cambridge University Press.
- Cowan, J. and Sharp, D. (1988) 'Neural nets and artificial intelligence', in Graubard, S. (ed.) (1988) *The Artificial Intelligence Debate*, London: MIT Press.
- Crump, M. (1989) 'Searching ESTC on BLAISE-LINE', *Factotum*, occasional paper 6.
- Date, C. (1986) *An Introduction to Database Systems*, Wokingham: Addison-Wesley.
- Dear, P. (ed.) (1991) *The Literary Structure of Scientific Argument*, Philadelphia PA: University of Pennsylvania Press.

- Deen, S. (1985) *Principles and Practice of Database Systems* London: Macmillan.
- DeLauretis, T. (1984) *Alice Doesn't: Feminism, Semiotics, Cinema*, Bloomington IN: Indiana University Press.
- (1990) 'Eccentric subjects: feminist theory and historical consciousness', *Feminist Studies*, 19:1, spring.
- Dennett, D. (1981) 'Where am I?', in Hofstadter, D. and Dennett, D. (eds) *The Mind's I: Fantasies and Reflections on Self and Soul*, Brighton: Harvester.
- (1988) 'When philosophers encounter artificial intelligence', in Graubard, S. (ed.) *The Artificial Intelligence Debate*, London: MIT Press.
- Derrida, J. (1974) *Of Grammatology*, trans. G.Spivak, London: Johns Hopkins University Press.
- Diamond, I. and Quinby, L. (eds) (1988) *Feminism and Foucault: Reflections on Resistance*, Boston MA: Northeastern University Press.
- Dietz, M. (1991) 'Hannah Arendt and feminist politics', in Shanley, M.L. and Pateman, C. (eds) *Feminist Interpretations and Political Theory*, Cambridge: Polity Press.
- DiLeonardo, M. (1991) 'Contingencies of value in feminist anthropology', in Hartman, J. and Messer-Davidow, E. (eds) *(En) Gendering Knowledge: Feminists in Academe*, Knoxville TN: University of Tennessee.
- DiStephano, C. (1991) 'Masculine Marx', in Shanley, M.L. and Pateman, C. (eds) *Feminist Interpretations and Political Theory*, Cambridge: Polity Press.
- Doell, R. (1991) 'Whose research is this? Values and biology', in Hartman, J. and Messer-Davidow, E. (eds) *(En) Gendering Knowledge: Feminists in Academe*, Knoxville TN: University of Tennessee.
- Doran, J. (1989) 'Distributed artificial intelligence and the modelling of sociocultural systems', in Murray, L. and Richardson, J. (eds) *Intelligent Systems in a Human Context: Development, Implications and Applications*, London: Oxford University Press.
- Dreyfus, H. (1981) 'From micro-worlds to knowledge representation: AI at an impasse', in Haugeland, J. (ed.) *Mind Design: Philosophy, Psychology, Artificial Intelligence* London: MIT Press.
- (1988) 'The Socratic and Platonic basis of cognitivism', *AI and Society*, 2:107.
- Dreyfus, H. and Dreyfus, S. (1988) 'Making a mind versus modeling the brain: artificial intelligence back at a branchpoint', in Graubard, S. (ed.) *The Artificial Intelligence Debate*, London: MIT Press.
- Driver, E. (1989) *Cookery Books Published in Britain, 1875–1914*, ed. L.Hunter, London: Prospect Books.
- Duncan, K. and Harris, D. (eds) (1985) *Computers in Education*, Proc. IFIP TC3, 4th World Conference on Computers in Education, North Holland: Elsevier.
- Eagleton, T. (1990) 'Nationalism, irony and commitment', in *Nationalism, Colonialism and Literature*, intro. S.Deane, Minneapolis MN: University of Minnesota Press.
- Eamon, W. (1994) *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture*, Ithaca NY: Princeton University Press.
- Edwards, D. (1989) "'Lost in hyperspace": cognitive mapping and navigation in a hypertext environment', in McAleese, R. (ed.) *Hypertext: Theory into Practice*, Oxford: Intellect Books.

- Ellul, J. (1980) 'The power of technique and the ethics of non-power', in Woodward, K. (ed.) *The Myths of Information: Technology and Post-industrial Culture*, London: Routledge and Kegan Paul.
- Elshstain, J. (1992) 'The power and powerlessness of women', in Bock, G. and James, S. (eds) *Beyond Equality and Difference: Citizenship, Feminist Politics and Female Subjectivity*, London: Routledge.
- Elsom-Cook, M. (1991a) 'Multimedia: the emperor's new clothes', *ALTNEWS, New Technologies and Learning in Europe*, 6, February.
- (1991b) *Artificial Intelligence and Human Institutions*, London: Springer Verlag.
- Ennals, R. (1987) 'Humanities and computing', in Rahtz, S. (ed.) *Information Technology in the Humanities: Tools, Techniques and Applications*, Chichester: Ellis Horwood.
- (1990) 'Interpretation and codebreaking', in Ennals, R. and Gardin, J.-C. (eds) (1990) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Ennals, R. (ed.) (1987) *Artificial Intelligence, State of the Art Report*, 15:3. Oxford: Pergamon Infotech.
- Ennals, R. and Gardin, J.-C. (eds) (1990) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Erickson, B. and Nosanchuk, T. (1983) *Understanding Data*, Milton Keynes: Open University Press.
- Faigley, L. (1992) *Fragments of Rationality: Postmodernity and the Subject of Composition*, London: University of Pittsburgh Press.
- Fargue, J. (1990) 'Remarks on the interrelations between artificial intelligence, mathematical logic and humanities', in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Felski, R. (1989) *Beyond Feminist Aesthetics: Feminist Literature and Social Change*, Cambridge MA: Harvard University Press.
- Ferguson, K. (1993) *The Man Question: Visions of Subjectivity in Feminist Theory*, Oxford: University of California Press.
- Feyerabend, P. (1988) [1975] *Against Method*, London: Verso.
- Finnegan, R., Salaman, G. and Thompson, K. (eds) (1987) *Information Technology: Social Issues, a Reader*, London: Hodder and Stoughton and the Open University.
- Flax, J. (1983) 'Political philosophy and the patriarchal unconscious', in Harding, S. and Hintikka, M. (eds) (1983) *Discovering Reality: Feminist Perspectives on Epistemology, Methodology and Philosophy of Science*, Dordrecht: Reidel.
- (1990) *Thinking in Fragments: Psychoanalysis, Feminism, and Postmodernism in the Contemporary West*, Berkeley CA: University of California Press.
- (1992) 'Beyond equality: gender, justice and difference', in Bock, G. and James, S. (eds) *Beyond Equality and Difference: Citizenship, Feminist Politics and Female Subjectivity*, London: Routledge.
- (1993) *Disputed Subjects: Essays on Psychoanalysis, Politics and Philosophy*, London: Routledge.

- Fodor, J. (1981) 'Methodological solipsism considered as a research strategy in cognitive psychology', in Haugeland, J. (ed.) *Mind Design: Philosophy, Psychology, Artificial Intelligence*, London: MIT Press.
- Foucault, M. (1970) *The Order of Things*, London: Tavistock.
- (1979) *Language, Counter-memory, Practice*, ed. D.Bouchard, Ithaca NY: Cornell University Press.
- Fox-Genovese, E. (1996) *Feminism is not the Story of My Life: How Today's Feminist Elite has Lost Touch with the Real Concerns of Women*, New York: Nan A.Talese.
- Fox-Keller, E. (1982) 'Feminism and science', *Signs*, 7:3.
- (1992) *Secrets of Life, Secrets of Death: Essays on Language, Gender and Science*, London: Routledge.
- Fox-Keller, E. and Longino, H. (eds) (1996) *Feminism and Science*, Oxford: Oxford University Press.
- Fraser, E., Hornsby, J. and Lovibond, S. (1992) *Ethics: A Feminist Reader*, Oxford: Blackwell.
- Fraser, N. (1989) *Unruly Practices: Power, Discourse and Gender in Contemporary Social Theory*, Cambridge: Polity Press.
- (1991) 'What's critical about critical theory? The case of Habermas and gender', in Shanley, M.L. and Pateman, C. (eds) *Feminist Interpretations and Political Theory*, Cambridge: Polity Press.
- Fricker, M. (1994) 'Knowledge as construct: theorizing the role of gender in knowledge', in Lennon, K. and Whitford, M. *Knowing the Difference: Feminist Perspectives in Epistemology*, London: Routledge.
- Frude, N. (1989) 'Intelligent systems off the shelf: the high street consumer and artificial intelligence', in Murray, L. and Richardson, J. (eds) *Intelligent Systems in a Human Context: Development, Implications and Applications*, London: Oxford University Press.
- Frye, M. (1993) [1987] 'The possibility of feminist theory', in Jaggar, A. and Rothenburg, P. *Feminist Frameworks: Alternative Theoretical Accounts of the Relations Between Women and Men*, London: McGraw Hill.
- Gadamer, H-G. (1981) [1976] *Reason in the Age of Science*, trans. F.Lawrence, London: MIT Press.
- Gardin, J.-C. (1990) 'Interpretation in the humanities: Some thoughts on the third way' in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Garver, E. (1988) 'Aristotle's *Rhetoric* on unintentionally hitting the principles of the sciences', *Rhetorica*, VI:4, autumn.
- Geiss, G. and Viswanathan, N. (1986) *The Human Edge: Information Technology and Helping People*, New York: Haworth Press.
- Gellner, E. (1982) 'Nationalism and the two forms of cohesion in complex societies', *Proceedings of the British Academy*, LXVIII, London: Oxford University Press.
- Giddens, A. (1980) [1973] *The Class Structure of the Advanced Societies*, London: Hutchinson.
- (1981) *A Contemporary Critique of Historical Materialism Vol. 1: Power, Property and the State*, London: Macmillan.

- (1987) 'Structuralism, post-structuralism and the production of culture', in Giddens, A. and Turner, J. (eds) *Social Theory Today*, Cambridge: Polity Press.
- Gill, K. (1987) 'Artificial intelligence and social action: education and training', in Goranzon, B. and Josefson, L. (eds) *Knowledge, Skill and Artificial Intelligence*, London: Springer Verlag.
- Gilligan, C. (1982) *In a Different Voice: Psychological Theory and Women's Development*, Cambridge MA: Harvard University Press.
- Golinski, J. (1982) *Science as public culture*, Cambridge: Cambridge University Press.
- (1990) 'The theory of practice and the practice of theory: sociological approaches in the history of science', *Isis*, 81.
- Gooding, D. (1989) "'Magnetic curves" and the magnetic field: experimentation and representation in the history of a theory', in Gooding, D., Pinch, T. and Schaffer, S. (eds) *The Uses of Experiment: Studies in the Natural Sciences*, Cambridge: Cambridge University Press.
- Gooding, D., Pinch, T. and Schaffer, S. (eds) (1989) *The Uses of Experiment: Studies in the Natural Sciences*, Cambridge: Cambridge University Press.
- Goranzon, B. (1987) 'The practice of the use of computers: a paradoxical encounter between different traditions of knowledge', in Goranzon, B. and Josefson, L. (eds) *Knowledge, Skill and Artificial Intelligence*, London: Springer Verlag.
- Goranzon, B. and Florin, M. (eds) (1990) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- Goranzon, B. and Josefson, L. (eds) (1987) *Knowledge, Skill and Artificial Intelligence*, London: Springer Verlag.
- Goyet, F. (1991) 'The word "Commonplaces" in Montaigne', in Hunter, L. (ed.) *Topos, Commonplace and Cliché: Toward an Understanding of Analogical Reasoning*, London: Macmillan.
- Grafton, A. and Jardine, L. (1986) *From Humanism to the Humanities*, London: Duckworth.
- Graubard, S. (ed.) (1988) *The Artificial Intelligence Debate*, London: MIT Press.
- Greene, J. (1987) *Memory, Thinking and Language*, London: Methuen.
- Griffiths, M. (1988) 'Strong feelings about computers', *Women's Studies International Forum*, 11:2.
- Habermas, J. (1987) *The Philosophical Discourse of Modernity*, Cambridge: Polity Press.
- (1985) 'Reply to Rorty', in Bernstein, R. (ed.) *Habermas and Modernity*, Cambridge: Cambridge University Press.
- (1973) [1971] *Theory and Practice*, trans. J. Viertel, Boston MA: Beacon Press.
- Halliday, M. and Hasan, R. (1976) *Cohesion in English*, New York: Longman.
- Hanen, M. and Nielsen, K. (1987) 'Science, morality and feminist theory', *Canadian Journal of Philosophy*, 13.
- Haraway, D. (1988) 'Situated knowledges: the science question in feminism and the privilege of partial perspective', *Feminist Studies*, 14:3.
- (1990) [1985] 'A manifesto for cyborgs: science, technology and socialist feminism in the 1980s', in Nicholson, L. (ed.) *Feminism/Postmodernism*, London: Routledge.
- (1991) *Modest\_Witness@Second\_Millennium. FemaleMan@\_Meets\_OncoMouse™*, London: Routledge.



- Harding, S. (1986) *The Science Question in Feminism*, Milton Keynes: Open University Press.
- (1991) *Whose Science? Whose Knowledge? Thinking from Women's Lives*, Milton Keynes: Open University Press.
- Harding, S. and Hintikka, M. (eds) (1983) *Discovering Reality: Feminist Perspectives on Epistemology, Methodology and Philosophy of Science*, Dordrecht: Reidel.
- Hardman, L. and Edwards, D. (1989) "'Lost in hyperspace": cognitive mapping and navigation in a hypertext environment', in McAleese, R. (ed.) *Hypertext: Theory into Practice*, Oxford: Intellect Books.
- Harnad, S. (1989) 'Minds, machines and Searle', *Journal of Experimental and Theoretical Artificial Intelligence*, 1:1.
- Hartman, J. and Messer-Davidow, E. (eds) (1991) *(En) Gendering Knowledge: Feminists in Academe*, Knoxville TN: University of Tennessee.
- Harwood, J. (1991) *Robert Boyle: The Early Essays and Ethics of Robert Boyle*, Carbondale IL: Southern Illinois University Press.
- Haugeland, J. (1985) *Artificial Intelligence: The Very Idea*, London: MIT Press.
- Haugeland, J. (ed.) (1981) *Mind Design: Philosophy, Psychology, Artificial Intelligence*, London: MIT Press.
- Havelock, E. (1963) *Preface to Plato*, Cambridge MA: Harvard University Press.
- Hekman, S. (1990) *Gender and Knowledge: Elements of a Postmodern Feminism*, Oxford: Polity Press/Blackwell.
- Henriquez, J., Hollway, W., Urwin, C., Venn, C. and Walkerdine, V. (1984) *Changing the Subject: Psychology, Social Regulation and Subjectivity*, London: Methuen.
- Hill Collins, P. (1990) *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*, London: Routledge.
- Hobsbawm, E. and Ranger, T. (eds) (1983) *The Invention of Tradition*, Cambridge: Cambridge University Press.
- Hockey, S. (1980) *Guide to Computer Applications in the Humanities*, London: Duckworth.
- Hockey, S. and Martin, J. (1988) *Oxford Concordance Program*, Oxford: Oxford University Computing Service.
- Hofstadter, D. (1979) *Gödel, Escher, Bach: An Eternal Golden Braid*, Harmondsworth: Penguin.
- Hofstadter, D. and Dennett, D. (eds) (1981) *The Mind's I: Fantasies and Reflections on Self and Soul*, Brighton: Harvester.
- Howell, W. (1956) *Logic and Rhetoric in England, 1500–1700*, Princeton NJ: Princeton University Press.
- Huizinga, J. (1949) [1944] *Homo Ludens: A Study of the Play-elements in Culture*, London: Routledge and Kegan Paul.
- Hunter, L. (1984a) *Rhetorical Stance in Modern Literature*, London: Macmillan.
- (1984b) *George Orwell: The Search for a Voice*, Milton Keynes: Open University Press.
- (1989) *Modern Allegory and Fantasy*, London: Macmillan.
- (1990a) 'The computer as machine: friend or foe?' in Turk, C.R.R. (ed.) *Humanities Research Using Computing*, London: Chapman and Hall.
- (1990b) 'Creating a hypertext with guide', in Darby, J. (ed.) *The CTISS File*, 9, February.

- (1990c) 'Fact-information-data-knowledge: databases as a way of organizing knowledge', *Journal of the Association for Literary and Linguistic Computing*, 5:1.
- (1990d) 'A rhetoric of mass communication: collective or corporate public discourse', in Enos, R. (ed.) *Oral and Written Communication: Historical approaches*, London: Sage.
- (1991a) 'Remember Frankenstein: rhetoric and artificial intelligence', *Rhetorica*, IX:4, winter.
- (1991b) 'Watson and McLuhan's *From Cliche to Archetype*', in Hunter, L. (ed.) *Topos, Commonplace and Cliché: Toward an Understanding of Analogical Reasoning*, London: Macmillan.
- (1993) 'AI and representation: a study of a rhetorical context for legitimacy', *AI and Society*, 7.
- (1994) 'The socialising of context: methodologies for hypertext', in Hunter, L., Beetham, M., Fuller, D. et al. *The Victorian Periodicals Project*, Oxford: CTI Centre for Texts.
- (1996a) 'Bodily functions in Cartesian space', in Chew, S. and Hunter, L. (eds) *Borderblur Poetry and Poetics in Canadian Literature*, Edinburgh: Quadriga.
- (1996b) *Outsider Notes: Feminist Approaches to the Nation State, Writers/Readers and Publishing in Canada 1960–95*, Vancouver: Talonbooks.
- (1997) 'Household books, 1500–1700', in Sedge, D. (ed.) *Cambridge Bibliography to English Literature, 1500–1700, third edition*, Cambridge: Cambridge University Press.
- Hunter, L. (ed.) (1991) *Topos, Commonplace and Cliché: Toward an Understanding of Analogical Reasoning*, London: Macmillan.
- Hunter, L. and Hutton, S. (eds) (1997) *Women in Medicine, Science and Technology, 1500–1700*, Stroud: Alan Sutton.
- Hunter, L., Beetham, M., Fuller, D. et al. (1994) *The Victorian Periodicals Project*, Oxford: CTI Centre for Texts.
- Hunter, L. and O'Rourke, R. (1996) *Creative Writing Strategies for English Studies*, Leeds: Adult and Continuing Education.
- Jahnke, H. and Otte, M. (eds) (1981) *Epistemological and Social Problems of the Science in the Early Nineteenth Century*, London and Dordrecht: Riedel.
- Jacob, P. (1990) 'What is interpretation?: a philosophical view' in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Jacobus, M., Fox-Keller, E. and Shuttleworth, S. (1990) *Body Politics: Women and the Discourses of Science*, London: Routledge.
- Jaggard, A. (1983) *Feminist Politics and Human Nature*, Brighton: Harvester.
- (1989) 'Love and knowledge: emotion in feminist epistemology', in Jaggard, A. and Bordo, S., *Gender/Body/Knowledge: Feminist Deconstructions of Being and Knowing*, New Brunswick NJ: Rutgers University Press.
- Jaggard, A. and Bordo, S. (1989) *Gender/Body/Knowledge: Feminist Deconstructions of Being and Knowing*, New Brunswick NJ: Rutgers University Press.
- Jaggard, A. and Rothenburg, P. (1993) *Feminist Frameworks: Alternative Theoretical Accounts of the Relations Between Women and Men*, London: McGraw Hill.
- Jakobson, R. (1956) 'Two aspects of language and two types of aphasic disturbances', in Jakobson, R. and Halle, M. *Fundamentals of Language*, The Hague: Mouton.



- James, S. (1992) 'The good-enough citizen: female citizenship and independence', in Bock, G. and James, S. (eds) *Beyond Equality and Difference: Citizenship, Feminist Politics and Female Subjectivity*, London: Routledge.
- Jameson, F. (1986) [1979] 'Foreword', in Lyotard, J., *The Postmodern Condition: A Report on Knowledge*, trans. G. Bennington and B. Massumi, Manchester: Manchester University Press.
- Janik, A. (1987) 'Tacit knowledge, working life and scientific "method"', in Goranzone, B. and Josefson, L. (eds) *Knowledge, Skill and Artificial Intelligence*, London: Springer Verlag.
- (1990) 'Tacit knowledge, rule-following and learning', in Goranzone, B. and Florin, M. (eds) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- Jardine, L. (1994) *Erasmus, Man of Letters*, London: Cambridge University Press.
- Jarratt, S. (1990) 'The first sophists and feminism: discourses of the "Other"', *Hypatia*, 5:1.
- (1991) *ReReading the Sophists: Classical Rhetoric Refigured*, Carbondale and Edwardsville IL: Southern Illinois Press.
- Johns, A. (1991) 'History, science, and the history of the book: The making of natural philosophy in early modern England', *Publishing History*, 30.
- Jonassen, D. (1989) *Hypertext/Hypermedia*, Englewood Cliffs NJ: Prentice Hall.
- Johannessen, K. (1990) 'Rule-following and intransitive understanding', in Goranzone, B. and Florin, M. (eds) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- Johnson-Laird, P. (1989) 'Human experts and expert system', in Murray, L. and Richardson, J. (eds) *Intelligent Systems in a Human Context: Development, Implications and Applications*, London: Oxford University Press.
- Kellas, J. (1991) *The Politics of Nationalism and Ethnicity*, London: Macmillan.
- Kirsch, D. (1991a) 'Foundations of AI: the big issues', *Artificial Intelligence*, 47.
- (1991b) 'Today the earwig, tomorrow man?', *Artificial Intelligence*, 47.
- Kuhn, T. (1962) *The Structure of Scientific Revolutions*, Chicago IL: Chicago University Press.
- Landow, G. (1992) *Hypertext: The Convergence of Contemporary Critical Theory and Technology*, London: Johns Hopkins University Press.
- Latour, B. (1989) 'Clothing the naked truth', in Lawson, H. and Appignanesi, L. (eds) *Dismantling Truth: Reality in the Post-modern World*, London: Weidenfeld and Nicolson.
- Latour, B. and Woolgar, S. (1979) *Laboratory Life: The Social Construction of Scientific Facts*, Beverley Hills CA: Sage.
- Lawson, H. (1985) 'Addressing fundamental problems in computer-related education and training', in Duncan, K. and Harris, D. (eds) *Computers in Education*, Proc. IFIP TC3, 4th World Conference on Computers in Education, North Holland: Elsevier.
- Lawson, H. and Appignanesi, L. (eds) (1989) *Dismantling Truth: Reality in the Post-modern World*, London: Weidenfeld and Nicolson.
- Lechner, J. (1962) *Renaissance Concepts of the Commonplaces*, Westport CT: Greenwood.
- Lenat, D. and Guha, R. (1989) *Building Large Knowledge-based Systems*, Reading MA: Addison Wesley.

- Lennon, K. and Whitford, M. (eds) (1994) *Knowing the Difference: Feminist Perspectives in Epistemology*, London: Routledge.
- Leslie, M. (1990) 'The Hartlib Papers Project: text retrieval with large datasets', *JALLC*, 5:1.
- Lloyd, G. (1984) *The Man of Reason: 'Male' and 'Female' in Western Philosophy*, London: Methuen.
- Longino, H. (1996) 'Subjects, Power, and Knowledge: Description and Prescription in Feminist Philosophies of Science', in Fox-Keller, E. and Longino, H. (eds) *Feminism and Science*, Oxford: Oxford University Press.
- Lovegrove, G. and Segal, B. (eds) (1991) *Women into Computing: Selected Papers 1988–90*, London: Springer Verlag.
- Lovibond, S. (1994) 'The end of morality?' in Lennon, K. and Whitford, M. (eds) *Knowing the Difference: Feminist Perspectives in Epistemology*, London: Routledge.
- Lyotard, J. (1986) [1979] *The Postmodern Condition: A Report on Knowledge*, trans. G. Bennington and B. Massumi, fwd by F. Jameson, Manchester: Manchester University Press.
- McAleese, R. (ed.) (1989) *Hypertext: Theory into Practice*, Oxford: Intellect Books.
- McCarthy, J. (1988) 'Mathematical logic in artificial intelligence', in Graubard, S. (ed.) *The Artificial Intelligence Debate*, London: MIT Press.
- McDermott, D. (1981) 'Artificial intelligence meets natural stupidity', in Haugeland, J. (ed.) *Mind Design: Philosophy, Psychology, Artificial Intelligence*, London: MIT Press.
- Macdonell, D. (1986) *Theories of Discourse*, Oxford: Blackwell.
- McGuire, J. and Melia, T. (1989) 'Some cautionary strictures on the writing of the rhetoric of science', *Rhetorica*, VII:1.
- Maddison, R. (1969) *The Life of the Hon. Robert Boyle*, London: Taylor and Francis.
- Machievelli, N. (1992) *The Prince*, New York: Dover.
- Mandel, H. and Levin, J. (eds) (1988) *Knowledge Acquisition from Texts and Pictures*, Amsterdam: Elsevier.
- Medawar, P. (1986) [1964] 'Is the scientific paper a fraud?' in Brown, J., Cooper, A., Huton, T., Toates, F. and Zeldin, D. (eds) *Science in Schools*, Milton Keynes: Open University Press.
- Medina, V. (1990) *Social Contract Theories: Political Obligation or Anarchy?*, Savage MD: Rowman and Littlefield Publishers.
- Merchant, C. (1980) *The Death of Nature: Women, Ecology and the Scientific Revolution*, London: Wildwood House.
- Miall, D. (1990) 'An expert system approach to the interpretation of literary structure', in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Michie, D. and Johnston, R. (1985) [1984] *The Creative Computer: Machine Intelligence and Human Knowledge*, Harmondsworth: Penguin.
- Miles, I., Rush, H., Turner, K. and Bessant, J. (1988) *Information Horizons: The Long-term Social Implications of New Information Technologies*, Aldershot: Edward Elgar.
- Minsky, M. (1981) 'A framework for presenting knowledge', in Haugeland, J. (ed.) *Mind Design: Philosophy, Psychology, Artificial Intelligence*, London: MIT Press.

- Mohanty, C., Russo, A. and Torres, L. (1991) *Third World Women and the Politics of Feminism*, Indianapolis IN: Indiana University Press.
- Molina, A. (1989) *The Social Basis of the Microelectronics Revolution*, Edinburgh: Edinburgh University Press.
- Moreton, A. (1978) *Literary Detection*, London: Scribner.
- Moss, J. Dietz (1989) 'The interplay of science and rhetoric in seventeenth century Italy', *Rhetorica*, VII:1, winter.
- Murphy, J.J. (ed.) (1982) *The Rhetorical Tradition and Modern Writing*, New York: Modern Languages Association.
- Murray, L. and Richardson, J. (eds) (1989) *Intelligent Systems in a Human Context: Development, Implications and Applications*, London: Oxford University Press.
- Mylopoulos, J. and Brodie, M. (eds) (1989) *Readings in Artificial Intelligence and Databases*, San Mateo CA: Morgan Kaufmann.
- Nairn, T. (1977) *The Break-up of Britain: Crisis and Neo-Nationalism*, London: New Left Books.
- Neel, J. (1994) *Aristotle's Voice*, Carbondale and Edwardsville IL: University of Illinois Press.
- Nilsson, N. (1982) *Principles of Artificial Intelligence*, New York.
- Nordenstam, T. (1987) 'Language and action', in Goranzon, B. and Florin, M. (eds) (1990) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- Norman, N. (1990) 'The electronic teaching theatre: interactive hypermedia and mental models of the classroom', in Ward, P. (ed.) 'Hypermedia and artificial intelligence', special edition of *Current Psychology*, New Brunswick NJ: Rutgers University Press.
- Olson, D. and Hildyard, A. (1983) 'Writing and literal meaning', in Martlew, M. (ed.) *The Psychology of Written Languages, Developmental and Educational Perspectives*, Chichester: Wiley.
- Ong, W. (1971) *Rhetoric, Romance and Technology: Studies in the Interaction of Expression and Culture*, Ithaca NY: Cornell University Press.
- O'Shea, T., Self, J. and Thomas, G. (eds) (1987) *Intelligent Knowledge-based Systems: An Introduction*, London: Harper & Row.
- O'Shea, T. (1987) 'IKBS—setting the scene', in O'Shea, T., Self, J. and Thomas, G. (eds) *Intelligent Knowledge-based Systems: An Introduction*, London.
- Papert, S. (1988) 'One AI or many?' in Graubard, S. (ed.) *The Artificial Intelligence Debate*, London: MIT Press.
- Parke, M. (1976) 'Influence of concepts of *Ordinatio* and *compilatio* in the development of the book', in Alexander, J. and Gibson, M., *Medieval Learning*, Oxford: Clarendon Press.
- Pateman, C. (1985) [1979] *The Problem of Political Obligation: A Critique of Liberal Theory*, Cambridge: Polity Press.
- (1991a) *Feminist Interpretations and Political Theory*, Cambridge: Polity Press.
- (1991b) "'God hath ordained to man a helper": Hobbes, patriarchy and conjugal right', in Shanley, M.L. and Pateman, C. (eds) *Feminist Interpretations and Political Theory*, Cambridge: Polity Press.
- (1995) *Democracy, Freedom and Special Rights*, Swansea: University of Wales.

- Pelling, M. (1994) 'Apprenticeship, health and social cohesion in early modern London', *History Workshop Journal*, 37.
- Penrose, R. (1989) *The Emperor's New Mind: Concerning Computers, Minds and the Laws of Physics*, fwd by M.Gardner, London: Oxford University Press.
- Perelman, C. and Olbrechts-Tyteca, L. (1971) *The New Rhetoric: A Treatise on Argumentation*, trans. J.Wilkinson and P.Weaver, London: Kluwer.
- Perelman, M. (1990) *Information, Social Relations and the Economics of High Technology*, London: Macmillan.
- Perreault, J. (1995) *Writing Selves: Contemporary Feminist Autography*, Minneapolis MN: University of Minnesota Press.
- Perry, R. (1991) 'Introduction', *Signs*, 16:1.
- Plato (1973a) *Phaedrus*, trans. W.Hamilton, Harmondsworth: Penguin.
- Plato (1973b) *The Republic*, trans. D.Lee, Harmondsworth: Penguin.
- Pocock, J. (1971) *Politics, Language and Time: Essays on Political Thought and History*, London: Methuen.
- Polanyi, M. (1967) *The Tacit Dimension*, London: Routledge and Kegan Paul.
- Poulakos, J. (1995) *Sophistical Rhetoric in Classical Greece*, Columbia SC: University of South Carolina Press.
- Poulantzas, N. (1978) *State, Power, Socialism*, trans. P.Camiller, London: New Left Books.
- Pravitz, D. (1987) 'Tacit knowledge—an impediment for AI?', in Goranzon, B. and Florin, M. (eds) (1990) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- Rahtz, S. (1987a) 'The "processing" of words', in Rahtz, S. (ed.) *Information Technology in the Humanities: Tools, Techniques and Applications*, Ellis Horwood.
- Rahtz, S. (ed.) (1987b) *Information Technology in the Humanities: Tools, Techniques and Applications*, Chichester: Ellis Horwood.
- Ramzuoglu, C. (ed.) (1993) *Up Against Foucault: Explorations of Some Tensions between Foucault and Feminism*, London: Routledge.
- Reynolds, N. (1993) 'Ethos as location: new sites for understanding discursive authority', *Rhetoric Review*, 11:2, spring.
- Roberts, R. and Goode, J. (eds) (1993) *The Rediscovery of Rhetoric*, London: Bristol Classical Press.
- Rorty, R. (1989) *Contingency, Irony, and Solidarity*, Cambridge: Cambridge University Press.
- (1991) *Essays on Heidegger and Others*, Cambridge: Cambridge University Press.
- (1985) 'Habermas and Lyotard on postmodernity', in Bernstein, R. (ed.) *Habermas and Modernity*, Cambridge: Cambridge University Press.
- (1991) *Objectivity, Relativism, and Truth*, Cambridge: Cambridge University Press.
- Rose, H. (1983) 'Hand, brain and heart: towards a feminist epistemology for the natural sciences', *Signs*, 9:1.
- (1993) 'Rhetoric, feminism and scientific knowledge: or, from either/or to both/and', in Roberts, R. and Goode, J. (eds) *The Rediscovery of Rhetoric*, London: Bristol Classical Press.
- (1994) *Love, Power and Knowledge: Towards a Feminist Transformation of the Sciences*, London: Polity Press.

- (1997a) 'Goodbye truth: hallo trust', in Maynard, M. (ed.) *Science and the Construction of Women*, London: University College London Press.
- (1997b) 'Subjectivity and sequences: moving beyond a determining culture', paper given to the Women and Texts/Les Femmes et les Textes, conference, Leeds, July 1997.
- Rose, H. and Rose, S. (eds) (1976a) *The Political Economy of Science*, London: Macmillan.
- (1976b) *The Radicalisation of Science: Ideology off/in the Natural Sciences*, London: Macmillan.
- (1976c) 'The incorporation of science', in Rose, H. and Rose, S. (eds) *The Radicalisation of Science: Ideology off/in the Natural Sciences*, London: Macmillan.
- Rose, S. (1973) 'Can science be neutral?', *Proceedings of the Royal Institute*, 45.
- (1992) *The Making of Memory: From Molecule to Mind*, London: Bantam Press.
- Rosser, S. (1992) *Biology and Feminism: A Dynamic Interaction*, Oxford: Twayne.
- Roszak, T. (1986) *The Cult of Information: The Folklore of Computing and the True Art of Thinking*, Cambridge: Lutterworth Press.
- Rotblat, J. (ed.) (1982) *Scientists, the Arms Race and Disarmament*, London: Taylor and Francis.
- Rouse, J. (1987) *Knowledge and Power Toward a Political Philosophy of Science*, London: Cornell University Press.
- Rowe, W. and Schelling, V. (1991) *Memory and Modernity: Popular Culture in Latin America*, London: Verso.
- Sawicki, J. (1991) 'Foucault and feminism: toward a politics of difference', in Shanley, M.L. and Pateman, C. (eds) *Feminist Interpretations and Political Theory*, Cambridge: Polity Press.
- Scanlon, R. (1966) [1958] 'Adolph Hitler and the technique of mass brainwashing', in *Rhetorical Idiom: Essays in Rhetoric, Oratory, Language and Drama*, New York: Russell and Russell.
- Scheman, N. (1991) 'Who wants to know: the epistemological value of values', in Hartman, J. and Messer-Davidow, E. (eds) *(En) Gendering Knowledge: Feminists in Academe*, Knoxville TN: University of Tennessee Press.
- Schiebinger, L. (1989) *The Mind has no Sex? Women in the Origins of Modern Science*, Cambridge MA: Harvard University Press.
- Scribner, S. and Cole, M. (1981) *The Psychology of Literature*, London: Harvard University Press.
- Searle, J. (1980) 'Minds, brains and programs', *Behavioural and Brain Sciences*, 3.
- (1987) 'Cognitive science and the computer metaphor', in Goranzone, B. and Florin, M. (eds) (1990) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- (1990) 'Is the brain's mind a computer program?', *Scientific American*, 262:1.
- Shanley, M.L. and Pateman, C. (eds) (1991) *Feminist Interpretations and Political Theory*, Cambridge: Polity Press.
- Shapin, S. (1988) 'The house of experiment', *Isis*, 79.
- (1991) "'A scholar and a gentleman": the problematic identity of the scientific practitioner in early modern England', *Journal of the History of Science*, XXIX.
- Sharples, M., Hogg, D., Hutchinson, C., Torrance, S. and Young, D. (eds) (1989) *Computers and Thought: A Practical Introduction to Artificial Intelligence*, London: MIT Press.

- Slack, P. (1979) 'Mirrors of health and treasures of poor men', in Webster, C. (ed.) *Heath Medicine and Mortality in the Sixteenth Century*, Cambridge: Cambridge University Press.
- Slesnick, T. (1985) 'Software for girls: a sexist solution', in Duncan, K. and Harris, D. (eds) *Computers in Education*, Proc. IFIP TC3, 4th World Conference on Computers in Education, North Holland: Elsevier.
- Sloan, T. (1974) 'The crossing of rhetoric and poetry in the English renaissance', in Sloan, T. and Waddington, C. (eds) *The Rhetoric of Renaissance Poetry from Wyatt to Milton*, London: University of California Press.
- Sloman, A. (1992) 'The Emperor's new mind', *Artificial Intelligence*, 56.
- Smith, B. (1991) 'The owl and the electric encyclopedia', *Artificial Intelligence*, 47.
- Smith, D. (1987) *The Everyday World as Problematic*, Boston: Northeastern University Press.
- (1990) *Texts, Facts, and Femininity: Exploring the Relations of Ruling*, London: Routledge.
- Smith, D. and Sage, M. (1985) 'Microcomputers and education in the United Kingdom: towards a framework for research', in Duncan, K. and Harris, D. (eds) *Computers in Education*, Proc. IFIP TC3, 4th World Conference on Computers in Education, North Holland: Elsevier.
- Sokolowski, R. (1988) 'Natural and artificial intelligence', in Graubard, S. (ed.) *The Artificial Intelligence Debate*, London: MIT Press.
- Spivak, G. 'Reflections on cultural studies in the post-colonial conjuncture', *Critical Studies: Cultural Studies Crossing Borders*, 3:1, 63–78.
- Spufford, M. (1981) *Small Books and Pleasant Histories*, Cambridge: Cambridge University Press.
- Stanley, L. (1991) 'Feminist Auto/Biography and Feminist Epistemology', in Aaron, J. and Walby, S. (eds) *Out of the Margins: Women's Studies in the Nineties*, London: The Falmer Press.
- (1994) 'The knowing because experiencing subject: narratives, lives and autobiography', in Lennon, K. and Whitford, M. (eds) *Knowing the Difference: Feminist Perspectives in Epistemology*, London: Routledge.
- Stigler, S. (1986) *The History of Statistics*, London: Belknap Press.
- Stock, B. (1983) *The Implications of Literacy: Written Language and Models of Interpretation in the Eleventh and Twelfth Centuries*, Ithaca NY: Princeton University Press.
- Stockinger, P. (1990) 'Logician analysis and conceptual inferences', in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Streuver, N. (1983) 'Lorenzo Valla: humanist rhetoric and the critique of the classical language of morality', in Murphy, J.J. (ed.) *Renaissance Eloquence*, London: University of California Press.
- Strong, T. (1993) 'How to write scripture: words, authority, and politics in Thomas Hobbes', *Critical Inquiry*, Autumn.
- Swearingen, C.J. (1991) *Rhetoric and Irony: Western Literacy and Western Lies*, Oxford: Oxford University Press.
- Tanesini, A. (1994) 'Whose language?', in Lennon, K. and Whitford, M. (eds) *Knowing the Difference: Feminist Perspectives in Epistemology*, London: Routledge.



- Tilghman, B. (1987) 'Seeing and seeing-as', in Goranzon, B. and Florin, M. (eds) (1990) *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer Verlag.
- Tulviste, P. (1979) 'On the origins of theoretic syllogistic reasoning in culture and the child', *Quarterly Newsletter of Comprehensive Human Cognition*, 1.
- Turkle, S. (1984) *The Second Self: Computers and the Human Spirit*, London: Granada.
- (1988) 'Artificial intelligence and psychoanalysis: a new alliance', in Graubard, S. (ed.) *The Artificial Intelligence Debate*, London: MIT Press.
- Turkle, S. and Papert, S. (1990) 'Epistemological pluralism: styles and voices within the computer culture', *Signs*, 16:1, autumn.
- Turner, R. (1984) *Logics for Artificial intelligence*, Chichester: Wiley.
- Violi, P. (1992) 'Gender, subjectivity and language', in Bock, G. and James, S. (eds) *Beyond Equality and Difference: Citizenship, Feminist Politics and Female Subjectivity*, London: Routledge.
- Wajcman, J. (1991) *Feminism Confronts Technology*, Cambridge: Polity Press.
- Wainwright, H. (1994) *Arguments for a New Left: Answering the Free Market Right*, Oxford: Blackwell.
- Wagman, M. (1991) *Artificial Intelligence and Human Cognition: A Theoretical Intercomparison of Two Realisms of Intellect*, London: Praeger.
- Wallace, W. (1989) 'Aristotelian science and rhetoric in transition: the Middle Ages and the Renaissance', *Rhetorica*, VII:1, winter.
- Waltz, D. (1988) 'The prospects for building truly intelligent machines', in Graubard, S. (ed.) *The Artificial Intelligence Debate*, London: MIT Press.
- Way, E. (1994) *Knowledge, Representation and Metaphor*, Oxford: Intellect Books.
- Weizenbaum, J. (1976) *Computer Power and Human Reason: From Judgement to Calculation*, Harmondsworth: Penguin.
- West, L. and Pines, A. (eds) (1985) *Cognitive Structure and Conceptual Change*, London: Academic Press.
- Wilcock, J. (1990) 'A critique of expert systems, and their past and present use in archaeology', in Ennals, R. and Gardin, J.-C. (eds) *Interpretation in the Humanities: Perspectives from Artificial Intelligence*, British Library, Library and Information Research Report 71, London: British Library.
- Williams, C. (1994) 'Feminism, subjectivity and psychoanalysis: towards a (corpo)real knowledge', in Lennon, K. and Whitford, M. (eds) *Knowing the Difference: Feminist Perspectives in Epistemology*, London: Routledge.
- Winograd, T. and Flores, F. (1986) *Understanding Computers and Cognition: A New Foundation for Design*, Norwood NJ: Addison Wesley.
- Winston, P. (1984) [1977] *Artificial Intelligence*, London: Addison Wesley.
- Wittgenstein, L. (1952) *The Blue and Brown Books*, Oxford: Blackwell.
- (1967) *Philosophical Investigations*, trans. G. Anscombe, Oxford: Blackwell.
- Wolff, J. (1990) *Feminine Sentences: Essays on Women and Culture*, Cambridge: Polity Press.
- Women and Words Collective (c. 1985) *In the Feminine: Women and Words/Les Femmes et les Mots*, Edmonton: Longspoon.

- (1992) *Women into Computing: Teaching Computing, Content and Methods*, Keele: Keele University Press.
- Woodhouse, D. (1985) 'Course integration', in Duncan, K. and Harris, D. (eds) *Computers in Education*, Proc. IFIP TC3, 4th World Conference on Computers in Education, North Holland: Elsevier.
- Woodward, K. (1980a) 'Preface: the Devil's hand', in Woodward, K. (ed.) *The Myths of Information: Technology and Post-industrial Culture*, London: Routledge and Kegan Paul.
- Woodward, K. (ed.) (1980b) *The Myths of Information: Technology and Post-industrial Culture*, London: Routledge and Kegan Paul.
- Woolgar, S. (1989a) 'The ideology of representation and the role of the agent', in Lawson, H. and Appignanesi, L. (eds) *Dismantling Truth: Reality in the Post-modern World*, London: Weidenfeld and Nicolson.
- (1989b) 'Why not a sociology of machine? An evaluation of prospects for an association between sociology and artificial intelligence', in Murray, L. and Richardson, J. (eds) *Intelligent Systems in a Human Context: Development, Implications and Applications*, London: Oxford University Press.
- (1991) 'The turn to technology in social studies of science', *Science, Technology and Human Values*, 16:1, winter.
- Wright, R. and Lickorish, A. (1989) 'The influence of discourse structure on display and navigation in hypertexts' in Williams, N. and Holt, P. (eds) *Computers and Writing*, Oxford: Intellect Books.
- Young, R. (1989) 'Human interface aspects of expert systems', in Murray, L. and Richardson, J. (eds) *Intelligent Systems in a Human Context: Development, Implications and Applications*, London: Oxford University Press.
- Yuval-Davis, N. (1997) *Gender and Nation*, London: Sage.
- Ziman, J. (1982) 'Basic principles', in Rotblat, J. (ed.) *Scientists, the Arms Race and Disarmament*, London: Taylor and Francis.