
Midgley
Science and Poetry

SCIENCE AND POETRY

Mary Midgley

London and New York

Copyrighted material

First published 2001
by Routledge
11 New Fetter Lane, London EC4P 4EE

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

Routledge is an imprint of the Taylor & Francis Group

This edition published in the Taylor & Francis e-Library, 2001.

© 2001 Mary Midgley

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 Cataloging in Publication Data
Midgley, Mary, 1919–
Science and poetry / Mary Midgley.
p. cm.
Includes bibliographical references and index.
1. Science—Philosophy. 2. Science—Methodology. I. Title.

Q175 .M612 2000
509—dc21 00–055817

ISBN 0–415–23732–7 (Print Edition)
ISBN 0-203-18794-6 Master e-book ISBN
ISBN 0-203-18917-5 (Glassbook Format)

Copyrighted material

CONTENTS

Copyrighted material

Copyrighted material

ACKNOWLEDGEMENTS

Part 1 of this book has grown out of two Victor Cook lectures (called 'Science and Poetry' and 'Atoms, Memes and Individuals') which the University of St Andrews kindly invited me to give in 1998. The generous terms of this foundation allowed me to give these lectures in Leeds and Glasgow as well as at St Andrews itself, a friendly arrangement which gave me the benefit of much helpful discussion in all three places. I am grateful to John Haldane and to everybody else, both at St Andrews and at the other two universities, who made these occasions so lively and fruitful. It was at this stage that I began to see how several (apparently separate) lines on which I had been working might converge to form this book.

In Part 2, Chapters 7 and 8 have grown out of a shorter version, 'Putting Our Selves Together Again' which appeared in *Consciousness and Human Identity* (edited by John Cornwell, Oxford University Press, 1998). Chapters 10 and 11 are an expanded version of 'Consciousness, Fatalism and Science' which appeared in *The Human Person in Science and Theology* (Edinburgh, T.&.T Clark, 2000). Chapters 12 to 16 incorporate two articles published in the *Journal of Consciousness Studies* – 'One World but a Big One' in vol. 3, no. 5–6, 1996 and 'Being Scientific about Our Selves' in vol. 6, April 1999.

In Part 3, Chapters 17 and 18 enlarge on an article called 'Towards an Ethic of Global Responsibility' which appeared in *Human Rights in Global Politics* (edited by Tim Dunne and Nicholas Wheeler, Cambridge University Press, 1999). The remaining five chapters are based on a pamphlet brought out by DEMOS in 2000 and called 'Individualism and the Concept of Gaia'. I am grateful to all the publishers and editors involved for making possible these earlier publications and for allowing versions of them to be reprinted here.

I have, of course, had endless help from friends, colleagues and fellow-explorers of this vast territory, notably from John Ziman, Steven Rose, Brian Goodwin, James Lovelock, Raymond Tallis, Rom Harré, Mary Clark,

Copyrighted material

Anne Primavesi and Andrew Brown. Claire Lamont has been most helpful in saving me from major errors about current literary criticism. Strachan Donnelley and his colleagues at the Hastings Center have repeatedly reminded me of ways in which the world is even wilder than I had been supposing. And my philosophical colleagues in Newcastle who have survived the destruction of their department – Ian Ground, Judith Hughes, Willie Charlton and Michael Bavidge – have continually thrown light on my awkward problems. So have David Midgley and David Brazier, who have also – on top of contributing a useful Buddhist angle – given me invaluable help, along with Tom and Martin Midgley, in baffling the malice of the Word Processor.

I have to thank the Society of Authors, which is the literary representative of the Estate of A.E. Housman, for permission to print a poem from *A Shropshire Lad* which appears on p. 89.

Copyrighted material

INTRODUCTION

WHO ARE WE?

This is a book about personal identity, about who and what we are. It is about the unity of our lives. It tries to suggest how we can resist the academic fashions that now fragment us. It looks at the various aspects of our selves which get separated by being involved in the different arts and sciences, and it asks how we can bring them together within our wider life. In particular, it asks how we can bring together our ideas of *science* and *poetry* within a whole that has a place for both of them. It investigates the strange, imperialistic, isolating ideology about science which now makes this kind of connection seem impossible.

That ideology is what makes science itself look alarming today. What is called 'anti-science' feeling is not usually an objection to the actual discovery of facts about the world. (That would be very odd.) Instead, it is a protest against this imperialism – a revulsion against the way of thinking which deliberately extends the impersonal, reductive, atomistic methods that are appropriate to physical science into social and psychological enquiries where they work badly. That they do work badly there has often been pointed out. Yet these methods are still often promoted as being the only rational way to understand such topics.

This deliberate extension makes it seem as if something called *science* is forbidding us to be human. But science does no such thing. The call to extend its methods into unsuitable territory does not come from science itself but from a peculiar vision of the world, a set of imaginative habits that have been associated with modern science since its dawn in the seventeenth century. Our visions – our ways of imagining the world – determine the direction of our thoughts, as well as being the source of our poetry. Poetry exists to express those visions directly, in concentrated form. But they are also expressed less directly in all our thoughts and actions, including scientific ones, where they often pass unnoticed and uncriticised.

Copyrighted material

SCIENTIFIC PSYCHOLOGY?

I have suggested that the particular vision which has been seen as scientific here centres on an unbalanced fascination with the imagery of atomism – a notion that the only way to understand anything is to break it into its ultimate smallest parts and to conceive these as making up something comparable to a machine. Because that method succeeded for a time so well in the physical sciences, people have hoped to extend it to the rest of life in two ways. The first and more obvious way is by reducing mind itself to matter and thus to physical particles. This is seen as a way to mend the yawning division which Descartes introduced between mind and body by letting the major partner swallow up the minor one. Thus, psychiatrists have sometimes tried to view their patients merely as physical mechanisms and behaviourist psychologists hoped to study human life purely in terms of outward behaviour – of the movement of human bodies – without referring at all to the thoughts and feelings of the people involved.

Not surprisingly, that project worked badly and the behaviourist scheme has been abandoned. Yet the underlying dream of making psychology *scientific* in some related sense still persists. That dream is not centrally fuelled by the wish for knowledge. It is primarily a dream of taming and simplifying our inner life so that it will somehow conform to the known laws of matter and will stop setting us problems of its own. The sciences chiefly invoked at present for this project are neurology and the study of evolution. This means that the best way to study people is by looking at them either through a microscope or through the wrong end of a telescope – the telescope of evolutionary time.

These are indeed both useful methods. But it is a little odd to give them this kind of priority. The reason for preferring these studies seems to be much more because of their success in other fields than from any special likelihood that they will help us here. This is essentially the approach well described of late by the story of the man who is found looking for his keys under a street-lamp and is asked whether that is where he dropped them. 'No,' he says, 'but it's much the easiest place to look.'

The other way of atomising human life does not involve materialism. It is *social atomism* – individualism – the idea that only individuals are real while the groupings in which they live are not. Each citizen is then a distinct, ultimately independent unit, linked to the others around it only externally, by contract. The roots of this idea are of course political rather than scientific. But individualist theorists have for some time claimed that the view is scientific in a sense that roots it in physical science. Nineteenth-century social Darwinists did this by insisting that free commercial competition was the predestined spearhead of the whole evolutionary process. In our own day, the rhetoric of the Selfish Gene has a similar effect, though it is less explicitly political.

Copyrighted material

REDUCTION, REALITY AND POWER

Both these atomistic doctrines rest on the idea that competition between separate units is the ultimate law of life. Both ignore the obviously equal importance of co-operation between organisms – and between the parts of organisms – at all levels. Both confer a misleading air of scientific rigour on the proposition that there is, ultimately, no such thing as society. Both therefore depend on a rather odd piece of metaphysics, namely the 'reductive' assumption that certain parts are, in some sense, always more real and significant than the whole they belong to. Thus Richard Dawkins:

> The individual organism . . . is not fundamental to life, but something that emerges when genes, which at the beginning of evolution were separate, warring entities, gang together in co-operative groups, as 'selfish co-operators'. The individual organism is *not exactly an illusion*. It is too concrete for that. But it is a secondary, derived phenomenon, cobbled together as a consequence of the actions of fundamentally separate, even warring agents. I shan't develop the idea but just float . . . the idea of a comparison with memes. Perhaps the subjective 'I', the person that I feel myself to be, is the same kind of semi-illusion. . . . *The subjective feeling of 'somebody in there' may be a cobbled, emergent, semi-illusion* analogous to the individual body emerging in evolution from the uneasy co-operation of genes.
>
> (From *Unweaving the Rainbow*, London, Penguin, 1998, pp. 308–9; emphases mine)

This is the formula of metaphysical reduction and it needs explanation. What can it actually mean to suggest that the things that we directly deal with are in some sense *less real* than certain selected parts – or alleged parts – of them? This mysterious point is seldom spelt out but it appears to centre on causality. The suggestion is that only these special parts are causally active. They are spontaneous, self-moving movers, while the wholes that they compose are mere passive outcomes of their activity.

Dawkins' wording here suggests that this is a historical truth – that these parts actually existed on their own before these wholes and gave rise to them. But this is not literal fact; it is a piece of symbolism. Memes, if they can be said to exist at all, certainly do so only as emergent aspects of human social life. Even their most fervent supporters have not suggested that they pre-existed as spiritual beings who originally produced that life.

We will come back to these ambitious memes in Chapter 5. I have discussed them more fully elsewhere.[1] It is also worth noticing in this connection the oddity of current doctrines about Evolutionary Psychology, which atomise the mind itself into a strong of separate molecules, a module for each capacity, envisaging the whole group of capacities as comparable to a Swiss

Copyrighted material

Army Knife. But a Swiss Army Knife is a tool. The Swiss Army, in fact, does not consist only of knives. It also needs people who know how to use them – people who can choose between the different blades. And the business of psychology (as is usually thought) is to understand people, not their tools.

As for genes, it is not in fact seriously suggested that, as a matter of historical fact, they ever existed as independent items, precursors and architects of the organisms that now embody them. As is well known, DNA itself is a totally inert molecule which would never have done anything if it had been put down in a world without organisms. It is produced by living cells just as their other essential molecules are and it works only as a part of them. It is no more capable of going around on its own than bones or leaves are. As Steven Rose explains:

> What brings DNA to life, what gives it meaning is the cellular environment in which it is embedded. . . . Genetic theorists with little biochemical understanding have been profoundly misled by the metaphors that Crick provided in describing DNA (and RNA) as 'self-replicating' molecules or replicators, as if they could do it all by themselves. But they aren't and they can't. . . . You may leave DNA or RNA for as long as you like in a test-tube and they will remain inert: they certainly won't make copies of themselves. . . . The functioning cell, as a unit, constrains the properties of its individual components. The whole has primacy over its parts.
>
> (Steven Rose, *Lifelines: Biology, Freedom, Determinism*, London, Penguin, 1997, pp. 127 and 169)

This well-known fact has been obscured in recent times by the enormous interest that was naturally, and rightly, generated by the discovery of DNA's role in reproduction. A more profound cause of it, however, is the symbolism – the uncontrolled tangle of metaphors that has grown up around that discovery, building up the notion of genes as possessed of an almost magical, spontaneous power. This exciting idea has been made even more seductive by the hope that, through genetic engineering, we ourselves may be able to dominate these powerful genes and thus become controllers of the whole system.

This misleading sense of genes as all-powerful has been much encouraged by the information-metaphor which depicts them as constantly giving orders to the entities around them. Rose writes:

> To continue the linguistic, information-theory metaphor within which genetic theory was now to be formulated, the directed synthesis of RNA on DNA was termed *transcription*, and the synthesis of protein on the RNA was *translation*. DNA had become the master-molecule, and the nucleus in which it was located had assumed its patriarchal role in relation to the rest of the cell. It is hard

Copyrighted material

> to know which had more impact on the future directions of biology – the determination of the role of DNA in protein synthesis, or the organizing power of the metaphor within which it was framed.
>
> (ibid., p. 120)

These linguistic images, when taken seriously, quickly made it seem that, as Dawkins puts it, 'Life is just bytes and bytes and bytes of digital information'.[2] That is, it is just a long string of orders through which the gene – always the informant – tells the docile cells what to do. But that, as Rose points out, is not at all how living cells actually work:

> Far from being isolated in the cell nucleus, magisterially issuing orders by which the rest of the cell is commanded, genes . . . are in constant dynamic exchange with their cellular environment. The gene as a unit determinant of a character remains a convenient Mendelian abstraction, suitable for armchair theorists and computer-modellers with digital mind-sets. The gene as an active participant in the cellular orchestra in any individual's lifeline is a very different proposition. . . . The organism is both the weaver and the pattern it weaves, the choreographer and the dance that is danced.
>
> (ibid., pp. 125–6 and 171)

DIFFERENT LEVELS, DIFFERENT PATTERNS

Why, then, have biologists lately become so obsessed with genes? Of course their interest has had plenty of point because the discoveries connected with genetics have been of real importance. But, like many such swings of interest in science, this one has led to a crescendo of over-simplification and exaggeration. As Brian Goodwin puts it:

> A striking paradox that has emerged from Darwin's way of approaching biological questions is that organisms, which he took to be primary examples of living nature, have faded away to the point where they no longer exist as fundamental and irreplaceable units of life. . . . Modern biology has come to occupy an extreme position in the spectrum of the sciences, dominated by historical explanations in terms of the evolutionary adventures of genes. Physics, on the other hand has developed explanations of different levels of reality, microscopic and macroscopic, in terms of theories appropriate to these levels, such as quantum mechanics for the behaviour of microscopic particles . . . and hydrodynamics for the behaviour of macroscopic liquids.
>
> (*How the Leopard Changed its Spots*, London, Weidenfeld and Nicolson, 1994, pp. ix–x)

Copyrighted material

Physicists, in fact, no longer make this crude reductionist move of claiming that their latest-discovered entities are the only real ones, because physics – far ahead of biology – has already gone through the trauma of understanding that there are many such discoveries and many such entities. 'Reality' turns out to contain many different kinds of pattern at different levels. No one of these discoveries therefore should be expressed in the dramatic metaphysical language of reality and illusion. Different ways of thinking co-exist and are appropriate on different scales. No one of them dominates or invalidates the others. Accordingly, Goodwin goes on:

> Despite the power of molecular genetics to reveal the hereditary essences of organisms, the large-scale aspects of evolution remain unexplained, including the origin of species. . . . It is here that new theories, themselves recently emerged within mathematics and physics, offer significant insights into the origins of biological order and form. Whereas physicists have traditionally dealt with 'simple' systems in the sense that they are made of few types of component, and observed macroscopic or large-scale order is then explained in terms of uniform interactions between these components, biologists deal with systems (cells, organisms) that are hideously complex. . . . However, what is being recognised within these 'sciences of complexity', as studies of these highly diverse systems are called, is that there *are* characteristic types of order that emerge from the interactions of many different components. . . . Order emerges out of chaos.
>
> (ibid., pp. x–xi)

In short, reductionism is not the only rational way of dealing with differences of scale. There are much better ways of representing them. Different forms of order can co-exist at different levels, so scientists can use different ways of thinking about them without fighting, without insisting on reduction and without scandal. Goodwin comments:

> Conflict only arises when there is confusion about what constitutes biological 'reality'. I take the position that organisms are as real, as fundamental, as irreducible as the molecules out of which they are made. They are a separate and distinct level of emergent biological order, and the one to which we most immediately relate since we ourselves are organisms.
>
> (p. xii)

There is, in fact, no need to talk about reality here at all.

I cannot here go further into the fascinating topic of how life actually did originate. (Interested readers should look at Stuart Kauffman's discussion of this.)[3] What we need to notice here is how hard it is to fit together

Copyrighted material

the various kinds of atomism that have been introduced into our thought at different organisational levels. If organisms are semi-illusory in relation to genes, are genes (then) also semi-illusory in relation to atoms and quarks? Is nothing actually real but quarks – or whatever particles may succeed quarks after the next revolution in physics? What would that mean? The problem is even worse about the question of society. Social atomism views individual people as autonomous ultimate units in full charge of their destiny. Physical atomism, by contrast, dissolves these people away into chance collections of smaller units such as molecules, quarks or genes, collections that are continuous with the landscape around them. It sees them as subordinate cogwheels exercising no sort of individual control. For the first story, free will is essential. For the second, it is impossible.

Yet both these opposite models of our selves are equally powerful in the rhetoric of today. We are continually being called, on the one hand, to exaggerate our freedom boastfully – which leads to orgies of remorse – and, on the other, to admit that we are actually only helpless cogs. These two exaggerations have, of course, grown up in reaction against one another. When we oscillate helplessly between them we manage to get the worst of both worlds.

BEYOND ATOMISM

This book is an attempt to find ways of avoiding that fate. It tries to understand better the general way in which these imaginative visions work and, more particularly, to grasp the part which atomistic visions have played in shaping our own culture. Part 1 of the book centres on this theme. It shows how, in spite of the clash just noted between them, the two forms of atomism have been closely linked in our history. They have constantly strengthened one another because the surface likeness between their forms has been much more noticed than their incongruity. Thus, the social development of individualism increased the symbolic appeal of physical atomism, while the practical successes of physical atomism made social individualism look scientific.

The social extension of atomistic methods (to which we will return in Chapter 15) is not, of course, really a scientific project at all, though it uses scientific language. It is a distortion that tends to discredit the whole idea of science by exploiting it to draw dubious political and moral conclusions. This distortion itself has become obvious over the very notion of an *atom* – the idea of an impenetrable, essentially separate unit as the ultimate form of matter. We know that today's physicists no longer use this billiard-ball model. They now conceive of particles in terms of their powers and their interactions with other particles, not as inert separate objects. The seventeenth-century idea of a world constructed out of ultimately disconnected units has proved to be simply a mistake. Instead,

Copyrighted material

physicists now see many levels of complexity, many different patterns of connection.

At an obvious level it follows that we ought no longer to be impressed by social atomism, or by behaviourism, in the way that we once were. We can see now that it cannot have been scientific to impose on social affairs a pattern which turns out to have been so inadequate for physics. But the moral goes much deeper. It is one that would still hold even if physics had not changed. That moral is that, quite generally, social and psychological problems cannot be solved by imposing on them irrelevant patterns imported from the physical sciences, merely because they are seductively simple.

Of course simplicity is one aim of explanation. Of course we need parsimony. But it is no use being parsimonious unless you are relevant. Explanations must be complex enough to do the particular work that they are there for, to answer the questions that are actually arising. There are always many alternative ways of simplifying things and we have to choose between them. The kind of parsimony that is too mean to deal with the points that really need explaining is not economy but futile miserliness. For any particular problem, we need a solution that sorts out the particular complications that puzzle us, not one that ignores them because they are untidy.

BECOMING CONSCIOUS OF CONSCIOUSNESS

In the last few decades, one complication of social life that had long been carefully ignored has managed to escape and erupt onto the academic scene. The modest fact that we are conscious is now agreed to constitute 'the problem of consciousness'. It is not really a single problem but an aspect of a thousand problems – namely, their subjective aspect. That aspect was long concealed and suppressed because it was believed that it would be disgracefully subjective even to mention anything subjective – that, in fact, it was impossible to think objectively about subjectivity. (This is the same reasoning which Dr Johnson neatly parodied in the line 'Who drives fat oxen should himself be fat'.)

This veto has now been withdrawn. Scientifically minded people now admit that conscious subjects exist and may affect the world. The first-person point of view is, then, not a myth (as the behaviourists sometimes said) but is, however regrettably, a natural fact like any other and perhaps an important one. The problem then arises: how can we fit it into conceptual schemes that were never meant to accommodate it? How are we to talk about ourselves as subjects? How, in particular, should we talk about the relation between ourselves as subjects and as objects – between the

Copyrighted material

first- and third-person aspects of ourselves? What sort of beings do we – as a whole – now turn out to be? The second part of the book deals mainly with this problem.

There is a real difficulty here because the natural sciences are wholly dedicated to talking about objects. That is their job. People like Galileo laid down clear conventions at the dawn of modern science to exclude everything subjective from those sciences. They cannot, therefore, provide a language for discussing the relations between subjects and objects. This does not, of course, stop scientists discussing these matters. They can perfectly well do so. But in order to do it they, like everyone else, have to use terms drawn from contexts other than the natural sciences, often ones drawn from everyday life.

Many people, however, are convinced that rational, intellectually respectable discussion can only be carried on in scientific language, meaning by *scientific* not just *disciplined* and *methodical*, like the language of history or logic or linguistics – which would be uncontroversial – but *drawn from the natural sciences*. They are sure that – as Richard Dawkins has recently put it – 'Science is the only way we know to understand the real world.'[4] They therefore see the problem of consciousness as essentially one of devising a 'science of consciousness', one which will be either directly derived from the existing natural sciences or else so like those sciences formally as to take its place among them without causing a scandal. Thus, the University of Arizona, when it kindly invited us all to its prestigious Fourth Tucson Conference on Consciousness for the year 2000, began its notice thus:

> Recent years have seen an explosion of work in the sciences and humanities on *science's last great frontier, the problem of consciousness*. Can there be *a scientific theory of consciousness*? If so, what form should this theory take? . . . A special focus of the conference will be the question of how the first-person and third-person perspectives can be integrated, and on *how first-person data on consciousness can be rigorously incorporated into science*.
>
> (Emphases mine)

As we know from discussions of space-travel, this metaphorical talk of 'last frontiers' is always imperialistic. It signals an intention to conquer the outstanding area and bring it under control. These organisers, then – even though they acknowledge contributions from the humanities – still seem to be using a simple territorial map on which any decent conceptual scheme will have to be one 'rigorously incorporated into science'. It is a map which shows science as isolated in purdah, a country cut off, as by an iron curtain, from the rest of our intellectual life. Throughout this book, and especially in Chapter 14, we will be seeing how misleading this is. That restriction

Copyrighted material

prevents us both from appreciating the real importance of science itself and from approaching the large problems about ourselves that we now face.

Investigators using this map approach their new problem on the jigsaw principle, armed with puzzle-pieces from various existing physical sciences such as neurology, quantum mechanics, genetics or the study of evolution. (Rather surprisingly, computer science too is now allowed to count as a science for this purpose, though it has no physical subject-matter, being actually a species of applied logic.) They try to fit their chosen pieces into the problem. But the problem does not accommodate them because it is one of a quite different kind. It is actually about how to relate different puzzles. It concerns *how best to fit together the different aspects of ourselves – notably, ourselves as subjects and ourselves as objects, our inner and our outer lives.*

MINDS AND BODIES: NEITHER APARTHEID NOR CONQUEST WILL WORK

Descartes notoriously simplified this issue in the early days of modern science by sharply dividing mind from body, subject from object, and handing the body over to physical science. This apartheid was a convenient arrangement for many purposes, allowing the different kinds of study to develop separately. But the lack of any intelligible relation between them made it impossible to fit them together. Yet such fitting was needed because, as both kinds of study developed, clashes arose over all sorts of issues where mind and body appeared to interact, centrally over free will. To arbitrate them, the two provinces had somehow to be related.

How can we now deal with these clashes? Descartes' model always had the drawback of suggesting that they could somehow be resolved by conquest – by one partner's swallowing up the other. Mind and body were both called *substances*. Though they were supposed to be totally unlike, this seemed to suggest that they were somehow comparable stuffs, one of which would turn out to be a form of the other. Either matter was really constructed out of mind (idealism) or mind was constructed out of matter (materialism).

Today a vague impression exists that materialism has won this battle. But I think it has become clear that both these solutions are equally unworkable. We have to avoid dividing ourselves up as Descartes did in the first place. *Things go wrong as soon as we start thinking about mind and body as if they were both objects* – that is, separate things in the world. The words *mind* and *body* do not name two separate kinds of stuff, nor two forms of a single stuff. The word *mind* is there to indicate something quite different – namely, ourselves as subjects, beings who *mind* about things. The two

Copyrighted material

words name points of view – the inner and the outer. And these are aspects of the whole person, who is the unit mainly to be considered.

Words like mind and body do not have to be the names of separate items. They, and the other many-sided words that we use for these topics – words such as *care*, *heart*, *spirit*, *sense* – are tools designed for particular kinds of work in the give-and-take of social life. They are essentially vernacular, and that is just their strength. They have been shaped by the everyday context of experience, which is just what we are trying to talk about. When we use them in controversy it is no use trying to disinfect them by the kind of abstraction that Descartes used or by replacing them with invented terms. They not are a cheap substitute, an inadequate 'folk-psychology', due to be replaced by the proper terms of the learned. They are well-adapted tools, shaped in each culture through long experience to express human thoughts and feelings. They come out of the same underlying world-visions which also emerge both in poetry and in science. Any faults that such words have are the faults of those wider visions and of the ways of life that go with them, not symptoms that the words themselves are too crude.

MATERIALISM IN DIFFICULTIES

Among these influential world-visions, the atomistic and mechanistic one that I just mentioned still seems, when seen from a distance, to hold the same prominent and respected place in our culture today that it has occupied since the seventeenth century. But if we look more closely we can see that it is in deep trouble. It is a vision of which far too much has been expected. As always happens in such cases, it started to reveal serious faults at the point when its supporters stopped treating it as just one interesting and fertile suggestion among others and decided to enthrone it as an 'omni-competent' universal method. Under that dangerous spotlight its various parts began to clash visibly both with one another and with other recognised truths. Confusion is now so bad that an overhaul is unavoidable.

The trouble is particularly serious over the concept of *materialism*. Starting from Descartes' division, this word seems to mean that we should no longer believe in two substances but only in one, namely matter. But in that case, who is there to do the believing? Matter is strictly defined in this system as mere object, passive and inert, not the kind of thing that could possibly think, feel or believe. And the world of matter is supposed to constitute an entirely self-contained machine. Why, then, does all experience show that we ourselves often do think and that our thought affects our actions?

This is the difficulty that has now forced theorists to attend at last to the problem of consciousness. They would probably have done so earlier

Copyrighted material

if they had not got side-tracked by arguments about religion. Many people welcomed materialism primarily as a way to get rid of religion, a reason for disbelieving in God and the immortality of the soul. Exciting political battles could be waged with the churches about this, so such debates held a huge attraction. But, like many lively feuds, these debates have actually been a side-show, a displacement activity, a distraction to avoid the real difficulty. Souls do not only concern us after death. They concern us now because we are conscious now. This fact has to be fitted into the world where we already live. No degree of scepticism about other possible spiritual worlds makes any difference to it.

Traditional materialism, in fact, asks us to believe in a world of objects without subjects, and – since we ourselves are subjects, being asked to do the believing – that proposal makes no sense. This vision is no more plausible than the idealist alternative of subjects without objects, indeed it is actually less so. The trouble is quite simply that the Cartesian concept of *matter*, which was framed in the first place as a contrast to mind, cannot be extended to take in its opposite without losing its meaning. In order to be stretched in that way, it would need to be entirely reshaped. As it happens, theoretical physicists are actually now engaged in reshaping that concept for a number of reasons, two of which are sharply relevant to this topic. One of these is their rejection of traditional determinism. The other is a difficulty about the status of 'observers' who are apparently subjects. Physicists, in fact, now find the seventeenth-century vision of matter unusable for their current purposes and they want to devise a new conceptual scheme to replace it. As we shall see, in attempting this they tend now to reject terms such as materialism altogether.

Many biologists and social scientists, however, do not seem to have yet heard news of this change in physics. They still vigorously promote traditional mechanism, atomism and materialism, along with the determinism that went with them. They still view these as 'hard' and clear doctrines, indispensable elements of rationality. Difficulties have long been obvious about this position. But on top of these familiar troubles, such defenders now face the new obstacle raised by debates about the status of subjectivity itself. Homo sapiens scientificus has started to admit that he is himself conscious and even that some other animals may be so too. This presents traditional-minded biologists and social scientists with serious problems. They are trying to confront them in a number of remarkable ways that will concern us throughout this book.

The obvious central difficulty concerns free will and the reality of human action. When Brutus murdered Caesar, did his own conscious thoughts and feelings contribute nothing to his action? Were those thoughts and feelings (as is now often claimed) merely an extra, a side-effect, a futile spin-off from autonomous processes in the brain? Were the neurones (in fact) the only real actors? If it is held that they were, then this supposedly

Copyrighted material

rational set of doctrines (materialism, atomism, mechanism and determinism) brings with it a much less rational-looking companion, namely fatalism. In this case it doesn't matter at all what we think and feel, because our thoughts and feelings cannot have any consequences. Effort – which is essentially conscious – is ineffectual and we can stop bothering with it. From now on, our conscious selves can just sit back and let the neurones live our lives for us.

WHAT IS FREE WILL FREE FROM?

We will discuss this problem in Chapters 9–11. But it may be as well to say something at once here about how I shall approach it. People discussing free will often take it for granted that determinism is a clear and rational doctrine while the idea of freedom is cloudy and dubious. But actually both ideas, in the form in which they are now usually contrasted, are at least equally obscure. I sign up here with Peter Strawson, who opened his very helpful remarks on the topic by saying 'I belong to . . . the party of those who do not know what determinism is'.[5] Centrally, the trouble is that the word *determine* is so ambiguous. The sense in which a general 'determines the fate of a private' describes outside compulsion. The sense in which 'three points determine a plane' does not involve it. It is this outside compulsion that we need to be free from. The general is a different person from the private. But body and mind are not separate persons. So it is not obvious that any such compulsion is involved in the relation between them – any more than it is in the relation between points and the plane that they belong to.

Determinism in the sense in which it is most often understood in public debate does seem to involve that outside compulsion. It is only made to look plausible by confusing those two senses. The mixed doctrine that results is not workable because it involves fatalism – a belief that all conscious effort is futile – which is not a view that anybody could actually live by, least of all anybody who goes to the trouble of forming arguments. As we shall see, if deterministic and mechanistic sages really believed that conscious effort had no effect, they would not take the trouble to write their books. Fatalistic people do not in fact write such books, because it is hard work to do so.

The concept of responsibility which is built into science, as it is into the rest of scholarship, bears out this unfortunate truth. People are not supposed to get Nobel prizes for work which they did not themselves consciously attend to, and this is no accident. What we are honoured and blamed for is our conscious effort. Honours and criticism alike attend work done on purpose by the whole person, not work ghosted by someone else – including one's neurones – while one is asleep. *It is the whole person who is honoured*

Copyrighted material

or criticised, because the work is invariably taken to be done by that person. Of course this person needs and uses suitable neurones, but that is another matter.

THE WIDER CONTEXT

The concepts of responsibility and freedom which emerge over free will bring us back in the third part of the book to the social aspects of our identity – to questions about how the kind of self that we are dealing with fits into the wider world and to the inadequacies of social atomism in dealing with this.

Any realistic notion of ourselves rests on the recognition that we ourselves – weak, ignorant and transient though we are – are certainly responsible beings, not bits of helpless dust floating in the wind. Responsibility, however, is the condition of a social creature, not of a stone or a solipsist. It is always responsibility *to* and *for* those around us.

This 'whole person' of whom we have been talking is not, then, a solitary, self-sufficient unit. It belongs essentially within a larger whole, indeed within an interlocking pattern formed by a great range of such wholes. These wider systems are not an alien interference with its identity. They are its home, its native climate, the soil from which it grows, the atmosphere which it needs in order to breathe. Their unimaginable richness is what makes up the meaning of our lives. *The self's wholeness is not, then, the wholeness of a billiard-ball but that of an organism*, a transient, struggling creature which has, of course, its own distinct shape but which still belongs in its own context and background. Much though this being values its own freedom, it unavoidably looks for its fulfilment to horizons far beyond its private destiny. The third part of this book asks how far these horizons extend – what place we take in a wider whole – what range of wider claims it is in our nature to recognise?

During the last four centuries political thinkers in the West have concentrated mainly on limiting those claims. They have put genuinely heroic efforts into cutting bonds. They have managed to free people from endless forms of oppression, both political and domestic and of course this has been a splendid achievement. The difficulty is just in seeing what it leads to now.

Freedom itself is a negative ideal. Its meaning depends in each case on what particular bonds it frees us *from*. The reformers who fought each special kind of oppression were always led by a vision of a particular kind of freedom that would replace it, a special way in which society would be changed when they had cut a certain kind of bond. But it has gradually become plain that this bond-cutting sequence is cumulative, which means that it cannot go on for ever. Humans are bond-forming animals. When

Copyrighted material

all the bonds are cut – when the various kinds of freedom are all added together – when a general vision of abstract freedom from every commitment replaces the more limited aims – then, it seems, we might be left with a meaningless life. It begins to seem doubtful whether any kind of human society is then possible at all.

De Tocqueville, who was immensely impressed by the earlier stages of this emancipating process in America and who certainly wished that burgeoning democracy well, was yet alarmed by psychological consequences which he saw following on from this development – so alarmed that he invented a new name for them Individualism. People (he wrote) were beginning to feel that

> they acquire the habit of always considering themselves as standing alone, and *they are apt to imagine that their whole destiny is in their own hands*. . . . Thus, not only does democracy make every man forget his ancestors, but it hides his descendants and separates his contemporaries from him: it throws him back for ever upon himself alone, and threatens in the end to *confine him entirely within the solitude of his own heart*.
>
> (Alexis de Tocqueville, *Democracy In America*, first published 1835, part 2, book 2, chapter 27; emphases mine)

This diagnosis will be discussed further in Chapter 14.

WHAT ABOUT THE EARTH?

I think that today we are becoming increasingly aware of these dangers, increasingly struck by the limitations of individualism. Of course we still acknowledge its ideals. Indeed, we are still inclined at times to favour any change which can be represented as a freedom, especially a commercial freedom, even if it seems otherwise harmful. But on the whole, the strange tide of social atomism that surged in the 1980s is considerably receding today. We see that we need to rebuild a more realistic attitude to our social nature. But we are somewhat puzzled about how to do it, how to conceive the wider world within which we are now inclined to try and take our place.

One movement in this direction which seems to me really important is the notion of *human rights*, which I discuss in Chapters 15 and 16. In dealing with the distresses of people outside our own nation, we are beginning to free ourselves from the narrow contractual thinking which ruled that these outsiders could not concern us at all. A number of practical considerations are in any case making it clear that globalisation cannot be avoided. Disasters do not respect national boundaries. Ships that sink tend to sink at both ends.

Copyrighted material

Another consideration, no less important, concerns our relation to the non-human world on which we depend. Since the Renaissance, most sages in our humanistic tradition, both on the right and the left, have neglected questions about that relation. Natural resources were assumed to be inexhaustible. Neither the fear of natural disaster nor the cautious reverence that goes with it in most societies has found much place in official Western thinking since the industrial revolution.

This has really been a bizarre tradition. Its effect is that today, when news continually comes in that these resources are actually failing, we find it simply impossible to take that information seriously. Something beyond the usual unwillingness to accept bad news is surely involved here. The way in which we have been accustomed to think of ourselves as isolated, cerebral units standing above the natural world blocks our understanding of how deeply and directly what goes wrong with that world can concern us. Here I think that recent propaganda for individualism – most notably the sociobiological literature of 'selfishness' – is still dangerously distorting people's perceptions. A quite different imagery is needed to make us grasp realistically that we are actually part of the natural world. I shall suggest that an excellent corrective here is the concept of Gaia – of the world as a self-maintaining whole, comparable to a single organism – a whole within which we, like all other creatures, are involved and play our part.

Thirty years ago, when James Lovelock first displayed this idea, the extreme reductivism then prevailing in biology made orthodox scientists reject it outright. Since that time, however, as the details of the idea have been worked out, a good deal of the science involved has been found to be quite plausible and is now being discussed at a normal level. The main difficulty, however, was never about those scientific details. It concerned the imagery, the vision of a wider whole, in some sense a living whole, of which we are a part. It became clear how much this imagery mattered to the scientists when Lovelock introduced a slightly different image, namely the medical model of the earth as a sick planet needing our care and attention – needing, in fact, a science of *geophysiology* to study its health and sickness.

This way of talking greatly reassured the scientific public. It has allowed detailed discussion of the implications to go on without alarm and outrage. This was reasonable because the metaphor of illness is indeed a valuable one, leaving room for the sense of urgency that we so badly need. By showing the earth as a whole rather than as a loose heap of replaceable resources, it makes it possible for us to see it as vulnerable, capable of health or sickness, capable of real injury. And these are indeed the terms in which we need to think about the alarming changes it is undergoing today.

Copyrighted material

Yet it is interesting to ask just what is the difference between this image and the original one of Gaia the earth-goddess. Why is one of them acceptable while the other still causes alarm? After all, the medical model too accepts that the earth should be treated as if it were a living whole, which was what was originally supposed to be objectionable.

Is the disturbing factor about the image of Gaia, then, its apparent connection with religion? It is interesting to note how readily such connections are now accepted in the prestigious area of theoretical physics, where topics such as 'the mind of God' are constantly discussed and where few people are keen to question Einstein's dictum that the roots of science lie in religion.

Obviously the idea of Gaia is a myth, a symbol. But then so is the sociobiological idea of the Selfish Gene. One of these myths emphasises our separateness from the world around us. The other emphasises our profound dependence on it. Since wholes are quite as real as parts, there is no reason in principle why we should have to prefer the first emphasis over the second. The choice between them depends on their relevance to our situation. And given that current situation, there seems to me to be little doubt about which of them we most need to guide our thinking today.

Copyrighted material

Part I

VISIONS OF RATIONALITY

Copyrighted material

1

THE SOURCES OF THOUGHT

IS ART A LUXURY?

Is there any connection between poetry and science? Academic specialisation usually divides these topics today so sharply that it is hard to relate them on a single map. But there is one very simple map which does claim to relate them, a map which is worth looking at because it has quite an influence on our thinking. It is the map which the distinguished chemist Peter Atkins draws in the course of arguing that science is *omnicompetent*, that is, able to supply all our intellectual needs. He notes that some people may think we need other forms of thought such as poetry and philosophy as well as science because science cannot deal with the spirit. They are mistaken, he says. These forms add nothing serious to science:

> Although poets may aspire to understanding, their talents are more akin to entertaining self-deception. They may be able to emphasise delights in the world, but they are deluded if they and their admirers believe that their identification of the delights and their use of poignant language are enough for comprehension. Philosophers too, I am afraid, have contributed to the understanding of the universe little more than poets. . . . They have not contributed much that is novel until after novelty has been discovered by scientists. . . . While poetry titillates and theology obfuscates, science liberates.
>
> (From 'The Limitless Power of Science' in *Nature's Imagination*, ed. John Cornwell, Oxford University Press, 1995, p. 123)

Though this view is not usually declared with quite such outspokenness and tribal belligerence it is actually not a rare one. A lot of people today accept it, or at least can't see good reason why they should not accept it,

Copyrighted material

even if they don't like it. They have a suspicion, welcome or otherwise, that the arts are mere luxuries and science is the only intellectual necessity. It seems to them that science supplies all the facts out of which we build (so to speak) the house of our beliefs. Only after this house is built can we – if we like – sit down inside it, turn on the CD player and listen to some Mozart or read some poetry.

As we shall see, however, this is not how we actually live our lives, still less how we ought to try to live them. Attempts to impose this pattern have distorted the intellectual scene of late from a number of angles. For instance, the idea that science is a separate domain, irrelevant to the arts, has often produced a strange kind of apartheid in the teaching of literature, a convention whereby important and powerful writings get ignored if their subject-matter concerns science, or even the physical world. Thus, criticism of Conrad's sea-stories tends to treat the storms and other natural disasters in them merely as scenery for the human dramas involved, rather than as a central part of their subject-matter. But if Conrad had simply wanted to study human behaviour he could have stayed in Poland. Similarly, H.G. Wells and the whole vigorous science-fiction tradition derived from him were long cold-shouldered out of the literary syllabus and have not yet fully reached it – even though writers like Conrad and Henry James admired Wells deeply and saw the force of his vision. Until quite lately, even *Frankenstein* was ignored. Potent ideas expressed in these writings have thus not been properly faced and criticised in the teaching of literature. These ideas are, of course, often ones about how the science by which we study the physical world relates to the rest of life, which is an extremely important topic. They include a wide range of matters that can help us in trying to understand and face the environmental crisis.

All this means that intending students face a rather bewildering choice. On the one hand they are offered a narrow, somewhat inward-looking approach to literature. On the other, they face a kind of science-teaching which never mentions the social attitudes and background assumptions that influence scientific thought – indeed, one that often views any mention of these topics as vulgar and dangerous. Thus, they may study either the outer *or* the inner aspect of human life, but must on no account bring the two together.

In fact, despite the efforts of many reformers, Descartes still rules. Mind and body are still held apart. Their division tends to produce a population of one-eyed specialists on both sides, specialists who are mystified by their respective opposite numbers and easily drift into futile warfare. It is surely worth while to take a much harder look at the misleading imaginative picture of the intellectual life which is the source of this habit.

Copyrighted material

LUCRETIUS AND THE VISION OF ATOMISM

This divisive picture is really very odd, one which does not fit the actual history of thought at all. Rereading Atkins' words lately, I began to think about his remark that poets and philosophers 'have not contributed much that is novel [to the understanding of the universe] until after novelty has been discovered by scientists'. What struck me then was the influence that a single great philosophic poem – Lucretius' *On The Nature Of The Universe – De Rerum Natura* – has actually played in the formation of modern Western thought, and especially of Western science.

That poem was the main channel through which the atomic theory of matter reached Renaissance Europe. It was forcibly stated there, all ready to be taken up by the founders of modern physics. Of course it was the Greek atomist philosophers who had invented the theory, and no doubt their work would have reached later thinkers in some form even without Lucretius' poem. But the force and fervour of the poem gave atomism a head start. It rammed the atomists' imaginative vision right home to the hearts of Renaissance readers as well as to their minds. That vision included, not just the atomic theory itself, but also the startling moral conclusions which Epicurus had already drawn from it. In this way it forged a much wider strand in Enlightenment thinking.

For Lucretius did not see atomism primarily as a solution to scientific problems. Following Epicurus, he saw it as something much more central to human life. For him it was a moral crusade – the only way to free mankind from a crushing load of superstition by showing that natural causation was independent of the gods. Human beings, he said, are so ceaselessly tormented by anxiety about natural events that they exhaust themselves in precautions against them that are useless and sometimes horrible, such as human sacrifice:

> They make propitiatory sacrifices, slaughter black cattle and despatch offerings to the Departed Spirits. . . . As children in blank darkness tremble and start at everything, so we in broad daylight are oppressed at times by fears as baseless as those horrors which children imagine coming upon them in the dark. This dread and darkness of the mind cannot be dispelled by the sunbeams, the shining shafts of day, but only by an understanding of the outward form and inner workings of nature. . . . How many crimes has religion led people to commit.
>
> (*De Rerum Natura*, trans. R.E. Latham, London, Penguin, 1951, book 2, lines 50–62, book 1, line 101)

Thus it was Lucretius who launched the notion of science as primarily a benign kind of weedkiller designed to get rid of religion, and launched

Copyrighted material