

Arguing for Wisdom in the University: An Intellectual Autobiography

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The Key to Wisdom

Nearly forty years ago I discovered a profoundly significant idea – or so I believe. Since then, I have expounded and developed the idea in six books¹ and countless articles published in academic journals and other books.² I have talked about the idea in universities and at conferences all over the UK, in Europe, the USA, Canada, and Taiwan. And yet, alas, despite all this effort, few indeed are those who have even heard of the idea. I have not even managed to communicate the idea to my fellow philosophers.³

What did I discover? Quite simply: the key to wisdom.⁴ For over two and a half thousand years, philosophy (which means “love of wisdom”) has sought in vain to discover how humanity might learn to become wise – how we might learn to create an enlightened world. For the ancient Greek philosophers, Socrates, Plato and the rest, discovering how to become wise was the fundamental task for philosophy. In the modern period, this central, ancient quest has been laid somewhat to rest, not because it is no longer thought important, but rather because the quest is seen as unattainable. The record of savagery and horror of the last century is so extreme and terrible that the search for wisdom, more important than ever, has come to seem hopeless, a quixotic fantasy. Nevertheless, it is this ancient, fundamental problem, lying at the heart of philosophy, at the heart, indeed, of all of thought, morality, politics and life, that I have solved. Or so I believe.

When I say I have discovered the key to wisdom, I should say, more precisely, that I have discovered the *methodological* key to wisdom. Or perhaps, more modestly, I should say that I have discovered that *science* contains, locked up in its astounding success in acquiring knowledge and understanding of the universe, the methodological key to wisdom. I have discovered a recipe for creating a kind of organized inquiry rationally designed and devoted to helping humanity learn wisdom, learn to create a more enlightened world.

What we have is a long tradition of inquiry – extraordinarily successful in its own terms – devoted to acquiring knowledge and technological know-how. It is this that has created the modern world, or at least made it possible. But scientific knowledge and technological know-how are ambiguous blessings, as more and more people, these days, are beginning to recognize. They do not guarantee happiness. Scientific knowledge and technological know-how enormously increase our power to *act*. In endless ways, this vast increase in our power to act has been used for the public good – in health, agriculture, transport, communications, and countless other ways. But equally, this enhanced power to act can be used to cause human harm, whether unintentionally, as in environmental damage (at least initially), or intentionally, as in war. It is hardly too much to say that all our current global problems have come about because of science and technology. The appalling destructiveness of modern warfare and terrorism, vast inequalities in wealth and standards of living between first and third worlds, rapid

population growth, environmental damage – destruction of tropical rain forests, rapid extinction of species, global warming, pollution of sea, earth and air, depletion of finite natural resources – all only exist today because of modern science and technology. Science and technology lead to modern industry and agriculture, to modern medicine and hygiene, and thus in turn to population growth, to modern armaments, conventional, chemical, biological and nuclear, to destruction of natural habitats, extinction of species, pollution, and to immense inequalities of wealth around the globe.

Science without wisdom, we might say, is a menace. It is the crisis behind all the others. When we lacked our modern, terrifying powers to act, before the advent of science, lack of wisdom did not matter too much: we were bereft of the power to inflict too much damage on ourselves and the planet. Now that we have modern science, and the unprecedented powers to act that it has bequeathed to us, wisdom has become, not a private luxury, but a public necessity. If we do not rapidly learn to become wiser, we are doomed to repeat in the 21st century all the disasters and horrors of the 20th: the horrifyingly destructive wars, the dislocation and death of millions, the degradation of the world we live in. Only this time round it may all be much worse, as the population goes up, the planet becomes ever more crowded, oil and other resources vital to our way of life run out, weapons of mass destruction become more and more widely available for use, and deserts and desolation spread.

The ancient quest for wisdom has become a matter of desperate urgency. It is hardly too much to say that the future of the world is at stake. But how can such a quest possibly meet with success? Wisdom, surely, is not something that we can learn and teach, as a part of our normal education, in schools and universities?

This is my great discovery! Wisdom *can* be learnt and taught in schools and universities. It *must* be so learnt and taught. Wisdom is indeed the proper fundamental objective for the whole of the academic enterprise: to help humanity learn how to nurture and create a wiser world.

But how do we go about creating a kind of education, research and scholarship that really will help us learn wisdom? Would not any such attempt destroy what is of value in what we have at present, and just produce hot air, hypocrisy, vanity and nonsense? Or worse, dogma and religious fundamentalism? What, in any case, *is* wisdom? Is not all this just an abstract philosophical fantasy?

The answer, as I have already said, lies locked away in what may seem a highly improbably place: science! This will seem especially improbable to many of those most aware of environmental issues, and most suspicious of the role of modern science and technology in modern life. How can *science* contain the methodological key to wisdom when it is precisely this science that is behind so many of our current troubles? But a crucial point must be noted. Modern scientific and technological research has met with absolutely astonishing, unprecedented success, as long as this success is interpreted narrowly, in terms of the production of expert knowledge and technological know-how. Doubts may be expressed about whether humanity as a whole has made progress towards well being or happiness during the last century or so. But there can be no serious doubt whatsoever that science has made staggering intellectual progress in increasing expert knowledge and know-how, during such a period. It is this astonishing intellectual progress that makes science such a powerful but double-edged tool, for good and for bad.

At once the question arises: Can we learn from the intellectual progress of science how to achieve progress in other fields of human endeavour? Is scientific progress exportable, as it were, to other areas of life? More precisely, can the progress-achieving methods of science be generalized so that they become fruitful for other worthwhile, problematic human endeavours, in particular the supremely worthwhile, supremely problematic endeavour of creating a good and wise world?

My great idea – that this can indeed be done – is not entirely new (as I was to learn after making my discovery). It goes back to the 18th century Enlightenment. This was indeed the key idea of the Enlightenment, especially the French Enlightenment: to learn from scientific progress how to achieve social progress towards an enlightened world. And the *philosophes* of the Enlightenment, men such as Voltaire, Diderot and Condorcet, did what they could to put this magnificent, profound idea into practice in their lives. They fought dictatorial power, superstition, and injustice with weapons no more lethal than those of argument and wit. They gave their support to the virtues of tolerance, openness to doubt, readiness to learn from criticism and from experience. Courageously and energetically they laboured to promote reason and enlightenment in personal and social life.

Unfortunately, in developing the Enlightenment idea intellectually, the *philosophes* blundered. They botched the job. They developed the Enlightenment idea in a profoundly defective form, and it is this immensely influential, defective version of the idea, inherited from the 18th century, which may be called the "traditional" Enlightenment, that is built into early 21st century institutions of inquiry. Our current traditions and institutions of learning, when judged from the standpoint of helping us learn how to become more enlightened, are defective and irrational in a wholesale and structural way, and it is this which, in the long term, sabotages our efforts to create a more civilized world, and prevents us from avoiding the kind of horrors we have been exposed to during the last century.

The task before us is thus *not* that of creating a kind of inquiry devoted to improving wisdom out of the blue, as it were, with nothing to guide us except two and a half thousand years of failed philosophical discussion. Rather, the task is the much more straightforward, practical and well-defined one of *correcting the structural blunders built into academic inquiry inherited from the Enlightenment*. We already have a kind of academic inquiry designed to help us learn wisdom. The problem is that the design is lousy. It is, as I have said, a botched job. It is like a piece of engineering that kills people because of faulty design – a bridge that collapses, or an aeroplane that falls out of the sky. A quite specific task lies before us: to diagnose the blunders we have inherited from the Enlightenment, and put them right.⁵

So here, briefly, is the diagnosis. The *philosophes* of the 18th century assumed, understandably enough, that the proper way to implement the Enlightenment programme was to develop social science alongside natural science. Francis Bacon had already stressed the importance of improving knowledge of the natural world in order to achieve social progress. The *philosophes* generalized this, holding that it is just as important to improve knowledge of the social world. Thus the *philosophes* set about creating the social sciences: history, anthropology, political economy, psychology, sociology.

This had an immense impact. Throughout the 19th century the diverse social sciences were developed, often by non-academics, in accordance with this Enlightenment idea.

Gradually, universities took notice of these developments until, by the mid 20th century, all the diverse branches of the social sciences, as conceived of by the Enlightenment, were built into the institutional structure of universities as recognized academic disciplines.

The outcome is what we have today, *knowledge-inquiry* as we may call it, a kind of inquiry devoted in the first instance to the pursuit of knowledge.

But, from the standpoint of creating a kind of inquiry designed to help humanity learn how to become enlightened and civilized, which was the original idea, all this amounts to a series of monumental blunders.

In order to implement properly the basic Enlightenment idea of learning from scientific progress how to achieve social progress towards a civilized world, it is essential to get the following three things right.

1. The progress-achieving methods of science need to be correctly identified.
2. These methods need to be correctly generalized so that they become fruitfully applicable to any worthwhile, problematic human endeavour, whatever the aims may be, and not just applicable to the one endeavour of acquiring knowledge.
3. The correctly generalized progress-achieving methods then need to be exploited correctly in the great human endeavour of trying to make social progress towards an enlightened, civilized world.

Unfortunately, the *philosophes* of the Enlightenment got all three points wrong. They failed to capture correctly the progress-achieving methods of natural science; they failed to generalize these methods properly; and, most disastrously of all, they failed to apply them properly so that humanity might learn how to become civilized by rational means. Instead of seeking to apply the progress-achieving methods of science, after having been appropriately generalized, to the task of creating a better world, the *philosophes* applied scientific method to the task of creating social *science*. Instead of trying to make *social* progress towards an enlightened world, they set about making *scientific* progress in knowledge of social phenomena. That the *philosophes* made these blunders in the 18th century is forgivable; what is unforgivable is that these blunders still remain unrecognized and uncorrected today, over two centuries later. Instead of correcting them, we have allowed our institutions of learning to be shaped by them as they have developed throughout the 19th and 20th centuries, so that now the blunders are an all-pervasive feature of our world.

The Enlightenment, and what it led to, has long been criticized, by the Romantic movement, by what Isaiah Berlin has called 'the counter-Enlightenment', and more recently by the Frankfurt school, by postmodernists and others. But these standard objections are, from my point of view, entirely missing the point. In particular, my idea is the very opposite of all those anti-rationalist, romantic and postmodernist views which object to the way the Enlightenment gives far too great an importance to natural science and to scientific rationality. My discovery is that what is wrong with the traditional Enlightenment, and the kind of academic inquiry we now possess derived from it – *knowledge-inquiry* – is not too much 'scientific rationality' but, on the contrary, not enough. It is the glaring, wholesale *irrationality* of contemporary academic inquiry, when judged from the standpoint of helping humanity learn how to become more civilized, that is the problem.

But, the cry will go up, wisdom has nothing to do with reason. And reason has nothing to do with wisdom. On the contrary! It is just such an item of conventional ‘wisdom’ that my great idea turns on its head. Once both reason and wisdom have been rightly understood, and the irrationality of academic inquiry as it exists at present has been appreciated, it becomes obvious that it is precisely *reason* that we need to put into practice in our personal, social, institutional and global lives if our lives, at all these levels, are to become imbued with a bit more wisdom. We need, in short, a new, more rigorous kind of inquiry which has, as its basic task, to seek and promote *wisdom*. We may call this new kind of inquiry *wisdom-inquiry*.

But what is wisdom? This is how I define it in *From Knowledge to Wisdom*, a book published some years ago now, in 1984, in which I set out my ‘great idea’ in some detail:

“[wisdom is] the desire, the active endeavour, and the capacity to discover and achieve what is desirable and of value in life, both for oneself and for others. Wisdom includes knowledge and understanding but goes beyond them in also including: the desire and active striving for what is of value, the ability to see what is of value, actually and potentially, in the circumstances of life, the ability to experience value, the capacity to use and develop knowledge, technology and understanding as needed for the realization of value. Wisdom, like knowledge, can be conceived of, not only in personal terms, but also in institutional or social terms. We can thus interpret [wisdom-inquiry] as asserting: the basic task of rational inquiry is to help us develop wiser ways of living, wiser institutions, customs and social relations, a wiser world.”⁶

What, then, are the three blunders of the Enlightenment, still built into the intellectual/institutional structure of academia?

First, the *philosophes* failed to capture correctly the progress-achieving methods of natural science. From D’Alembert in the 18th century to Karl Popper in the 20th, the widely held view, amongst both scientists and philosophers, has been (and continues to be) that science proceeds by assessing theories impartially in the light of evidence, *no permanent assumption being accepted by science about the universe independently of evidence*. Preference may be given to simple, unified or explanatory theories, but not in such a way that nature herself is, in effect, assumed to be simple, unified or comprehensible.

This orthodox view, which I call *standard empiricism* is, however, untenable. If taken literally, it would instantly bring science to a standstill. For, given any accepted fundamental theory of physics, T, Newtonian theory say, or quantum theory, endlessly many empirically more successful rivals can be concocted which agree with T about observed phenomena but disagree arbitrarily about some unobserved phenomena, and successfully predict phenomena, in an *ad hoc* way, that T makes false predictions about, or no predictions. Physics would be drowned in an ocean of such empirically more successful rival theories.

In practice, these rivals are excluded because they are disastrously disunified. *Two* considerations govern acceptance of theories in physics: empirical success and unity. In demanding unity, we demand of a fundamental physical theory that it ascribes *the same* dynamic laws to the phenomena to which the theory applies.⁷ But in persistently

accepting unified theories, to the extent of rejecting disunified rivals that are just as, or even more, empirically successful, physics makes a big persistent assumption about the universe. The universe is such that all disunified theories are false. It has some kind of unified dynamic structure. It is physically comprehensible in the sense that explanations for phenomena exist to be discovered.

But this untestable (and thus metaphysical) assumption that the universe is physically comprehensible is profoundly problematic. Science is obliged to assume, but does not know, that the universe is comprehensible. Much less does it know that the universe is comprehensible in this or that way. A glance at the history of physics reveals that ideas have changed dramatically over time. In the 17th century there was the idea that the universe consists of corpuscles, minute billiard balls, which interact only by contact. This gave way to the idea that the universe consists of point-particles surrounded by rigid, spherically symmetrical fields of force, which in turn gave way to the idea that there is one unified self-interacting field, varying smoothly throughout space and time. Nowadays we have the idea that everything is made up of minute quantum strings embedded in ten or eleven dimensions of space-time. Some kind of assumption along these lines must be made but, given the historical record, and given that any such assumption concerns the ultimate nature of the universe, that of which we are most ignorant, it is only reasonable to conclude that it is almost bound to be false.

The way to overcome this fundamental dilemma inherent in the scientific enterprise is to construe physics as making a hierarchy of metaphysical assumptions concerning the comprehensibility and knowability of the universe, these assumptions asserting less and less as one goes up the hierarchy, and thus becoming more and more likely to be true, and more nearly such that their truth is required for science, or the pursuit of knowledge, to be possible at all. In this way a framework of relatively insubstantial, unproblematic, fixed assumptions and associated methods is created within which much more substantial and problematic assumptions and associated methods can be changed, and indeed improved, as scientific knowledge improves. Put another way, a framework of relatively unspecific, unproblematic, fixed *aims* and methods is created within which much more specific and problematic aims and methods evolve as scientific knowledge evolves. There is positive feedback between improving knowledge, and improving aims-and-methods, improving knowledge-about-how-to-improve-knowledge. This is the nub of scientific rationality, the methodological key to the unprecedented success of science. Science adapts its nature to what it discovers about the nature of the universe. Philosophy of science (the study of the aims and methods of science) becomes an integral, vital part of science itself. And science becomes much more like natural philosophy in the time of Newton, a synthesis of science, methodology, epistemology, metaphysics and philosophy.

This hierarchical conception of physics, which I call *aim-oriented empiricism*, can readily be generalized to take into account problematic assumptions associated with the aims of science having to do with *values*, and the *social uses* or *applications* of science. It can be generalized so as to apply to the different branches of natural science. Different sciences have different specific aims, and so different specific methods although, throughout natural science there is the common meta-methodology of aim-oriented empiricism.

So much for the first blunder of the traditional Enlightenment, and how to put it right.⁸

Second, having failed to identify the methods of science correctly, the *philosophes* naturally failed to generalize these methods properly. They failed to appreciate that the idea of representing the problematic aims (and associated methods) of science in the form of a hierarchy can be generalized and applied fruitfully to other worthwhile enterprises besides science. Many other enterprises have problematic aims – problematic because aims conflict, and because what we seek may be unrealizable, undesirable, or *both*. Such enterprises, with problematic aims, would benefit from employing a hierarchical methodology, generalized from that of science, thus making it possible to improve aims and methods as the enterprise proceeds. There is the hope that, as a result of exploiting in life methods generalized from those employed with such success in science, some of the astonishing success of science might be exported into other worthwhile human endeavours, with problematic aims quite different from those of science.

Third, and most disastrously of all, the *philosophes* failed completely to try to apply such generalized, hierarchical progress-achieving methods to the immense, and profoundly problematic enterprise of making social progress towards an enlightened, wise world. The aim of such an enterprise is notoriously problematic. For all sorts of reasons, what constitutes a good world, an enlightened, wise or civilized world, attainable and genuinely desirable, must be inherently and permanently problematic. Here, above all, it is essential to employ the generalized version of the hierarchical, progress-achieving methods of science, designed specifically to facilitate progress when basic aims are problematic. It is just this that the *philosophes* failed to do. Instead of applying the hierarchical methodology to *social life*, the *philosophes* sought to apply a seriously defective conception of scientific method to *social science*, to the task of making progress towards, not a *better world*, but to better *knowledge* of social phenomena. And this ancient blunder, developed throughout the 19th century by J.S. Mill, Karl Marx and many others, and built into academia in the early 20th century with the creation of the diverse branches of the social sciences in universities all over the world, is still built into the institutional and intellectual structure of academia today, inherent in the current character of social science.

Properly implemented, in short, the Enlightenment idea of learning from scientific progress how to achieve social progress towards an enlightened world would involve developing social inquiry, not primarily as *social science*, but rather as *social methodology*, or *social philosophy*. A basic task would be to get into personal and social life, and into other institutions besides that of science – into government, industry, agriculture, commerce, the media, law, education, international relations – hierarchical, progress-achieving methods (designed to improve problematic aims) arrived at by generalizing the methods of science. A basic task for academic inquiry as a whole would be to help humanity learn how to resolve its conflicts and problems of living in more just, cooperatively rational ways than at present. The fundamental intellectual and humanitarian aim of inquiry would be to help humanity acquire wisdom – wisdom being, as I have already indicated, the capacity to realize (apprehend and create) what is of value in life, for oneself and others.

One outcome of getting into social and institutional life the kind of aim-evolving, hierarchical methodology indicated above, generalized from science, is that it becomes possible for us to develop and assess rival philosophies of life as a part of social life, somewhat as theories are developed and assessed within science. Such a hierarchical

methodology provides a framework within which competing views about what our aims and methods in life should be – competing religious, political and moral views – may be cooperatively assessed and tested against broadly agreed, unspecific aims (high up in the hierarchy of aims) and the experience of personal and social life. There is the possibility of cooperatively and progressively improving *such philosophies of life* (views about what is of value in life and how it is to be achieved) much as *theories* are cooperatively and progressively improved in science.

Wisdom-inquiry, because of its greater rigour, has intellectual standards that are, in important respects, different from those of knowledge-inquiry. Whereas knowledge-inquiry demands that emotions and desires, values, human ideals and aspirations, philosophies of life be excluded from the intellectual domain of inquiry, wisdom-inquiry requires that they be included. In order to discover what is of value in life it is essential that we attend to our feelings and desires. But not everything we desire is desirable, and not everything that feels good is good. Feelings, desires and values need to be subjected to critical scrutiny. And of course feelings, desires and values must not be permitted to influence judgements of factual truth and falsity.

Wisdom-inquiry embodies a synthesis of traditional Rationalism and Romanticism. It includes elements from both, and it improves on both. It incorporates Romantic ideals of integrity, having to do with motivational and emotional honesty, honesty about desires and aims; and at the same time it incorporates traditional Rationalist ideals of integrity, having to do with respect for objective fact, knowledge, and valid argument. Traditional Rationalism takes its inspiration from science and method; Romanticism takes its inspiration from art, from imagination, and from passion. Wisdom-inquiry holds art to have a fundamental rational role in inquiry, in revealing what is of value, and unmasking false values; but science, too, is of fundamental importance. What we need, for wisdom, is an interplay of sceptical rationality and emotion, an interplay of mind and heart, so that we may develop mindful hearts and heartfelt minds (as I put it in my first book *What's Wrong With Science?*). It is time we healed the great rift in our culture, so graphically depicted by C. P. Snow.⁹

The revolution we require – intellectual, institutional and cultural – if it ever comes about, will be comparable in its long-term impact to that of the Renaissance, the scientific revolution, or the Enlightenment. The outcome will be traditions and institutions of learning rationally designed to help us realize what is of value in life. There are a few scattered signs that this intellectual revolution, from knowledge to wisdom, is already under way.¹⁰ It will need, however, much wider cooperative support – from scientists, scholars, students, research councils, university administrators, vice chancellors, teachers, the media and the general public – if it is to become anything more than what it is at present, a fragmentary and often impotent movement of protest and opposition, often at odds with itself, exercising little influence on the main body of academic work. I can hardly imagine any more important work for anyone associated with academia than, in teaching, learning and research, to help promote this revolution.

Childhood

It may be thought that my idea that I can publish a few books and articles, give a few lectures, and thereby, single-handedly as it were, transform the entire academic

enterprise, amounts to megalomania, if not downright lunacy. Where did such a mad project come from?

It all goes back to my childhood. For as far back as I can remember, I seem to have found the world baffling, mysterious and frightening. Above all I was terrified by the black inevitability of death. From the age of four, I was haunted by problems of war, theology, cosmology, physics, consciousness, epistemology, and the meaning of life.

One night, when I was three years old, during the early stages of the second world war, the German Luftwaffe dropped bombs in a field not so very far from our house. Later that night I paced to and fro in my parents' bedroom, my hands deep in my dressing gown pockets, my head bowed in thought. Finally, I stopped, turned to my parents, and asked: "Mummy, why do they have wars?" Today, I am proud of my three year old self for asking that good question.

Around the same time, I entered into a fierce theological debate with the boy next door. He was trying to convince me of the existence of God. "If God doesn't exist" he argued "who do you think made the earth? Who made the trees? Who made the stars?" I listened to this litany of questions in silence for a while, and then asked in turn: "And who made God?" The boy next door went away without giving me an answer.

A little later, when I was four, I got interested in natural philosophy and cosmology. I invented a theory as to why the sky is blue. According to this theory, the sky is blue because air is very, very slightly blue. When you look at things close to, the blueness of the air is too slight to be noticed, but when you look at the sky, you see through so much air that the blueness is easy to see. I can remember trying to convince my father of this explanation for the blueness of the sky – and I remember my exasperation when, for some extraordinary reason, he remained unconvinced.

I also remember lying awake in bed one summer evening at this time, puzzling about how space can come to an end. It occurred to me that far away in the sky there must be a vast wall that marks the outer boundary of everything. For a while, this seemed to me to be a satisfactory enough solution to the problem. And then I had the awful thought: But what is behind the wall? Something must be behind the wall!

About a year later, when I was about five, I made the extraordinary discovery of self-consciousness. I had had a row with my mother. She wanted me and my sister to go for a walk. I protested. "It will rain", I declared, pointing to some dark clouds. Off my mother and sister went, leaving me behind. Feeling somewhat resentful and self-righteous, alone in the house, it began to dawn on me that I had something infinitely precious and mysterious that no one else had: my own awareness of myself, my inner secret thoughts and feelings.

A year later, by the age of six, my passion for natural philosophy was well aroused. One day, I asked my father how it was possible to make tubes as small as those in the filaments of electric light bulbs, so that electricity could flow through. My father explained that the filaments, like all electric wires, are solid metal. At first I was furiously indignant: how could electricity possibly flow through solid metal? But when it became clear that my father really did know what he was talking about, I fell silent, stupefied by this mystery of electricity flowing through solid metal. Electricity took on for me a quality that was both fascinating and nightmarish. I knew it was dangerous, and could kill. I had been told that in an unused, upper story of our house, firmly out of bounds, there were uninsulated "live" wires. I imagined "live" wires lashing out, dealing out their

terrible sting of electric death. On one occasion a girl visiting for the day, much older than me (she was eight or nine years old) persuaded me, against my better judgment, to put my finger into the empty socket of a table lamp. She assured me that it was perfectly safe, and that I would not feel a thing. In fact I received a shock – fortunately only through the tip of my finger. Here, then, was the violent rushing pain and mystery of electricity, experienced at first hand. From a cautious distance, I would contemplate the transformer in our garden, hidden behind some bushes, softly humming to itself, quietly containing its secret, deadly power. At about this time, I began to take torches and batteries to pieces to try to discover how they worked.

One day while in the garden, I made what seemed to me to be a wonderful discovery. I discovered a reason for believing in the existence of atoms. If atoms did not exist – I felt rather than thought – and matter remained exactly the same, however minutely it might be subdivided, then there could exist nothing to fix the size of things. Things could be any size. But things are not any size: somehow, people, animals, plants do know roughly what size to be. Therefore atoms of some kind or other, of a definite size, must exist, to fix the size of everything else.

I found this argument entirely convincing, although not for one moment did I suppose it would convince anyone else. Indeed, the dramatic and extraordinary discovery that I felt I had made was, at the time, wholly private, uncommunicable, beyond words, my own personal wordless recognition of the force of the argument that I have here spelled out in words, a feeling rather than a thought. I did not imagine at the time that an insight so emotional and personal could be put into words, and thus be rendered open to public understanding and scrutiny.

Also, at about this time (around the age of five or six), I discovered for myself the problem of perception. I was sitting on the sofa in the living room, and I began to think about what was going on as I looked about me at objects in the room. I thought about the light which was reflected from tables, chairs, the walls of the room, and which then entered my eyes to cause me to have the experience of seeing. What I was really seeing, it seemed, was the light entering my eyes, not the furniture around me. Here was the sofa, the carpet, the table, wholly visible and obvious before me. And yet, it seemed, I could not possibly be seeing these things. I could only really see what happens when light enters my eyes. This room I was seeing must somehow be inside my head – and yet it could not possibly be inside my head! The more I thought about it the more horrible the problem became. Mentally, if not physically, I was staggering about the room, clutching my head, tearing out my hair, bewildered beyond belief.

In recounting these childhood discoveries (in the main discoveries of problems rather than of solutions to problems), I am perhaps in part just boasting, in a rather foolish and shameful way. Certainly, I am today absurdly proud of these childhood discoveries of mine: I tremble to think of how I may subsequently have squandered the early passionate intellectual curiosity and independence these discoveries reveal. But in another way, I am not boasting at all. All of us, I believe, are extraordinarily active and creative intellectually when we are very young. Bryan Magee gives a vivid, dramatic account of similar philosophical discoveries that he made when young.¹¹ Somehow, in the first few years of life, we acquire an identity, a consciousness of self; we discover, or create, a whole view of the world, a cosmology; and we learn to understand speech, and to speak ourselves. And we achieve all this without any formal education whatsoever. Compared

with these mighty intellectual achievements of our childhood, the heights of adult artistic and scientific achievement all but fade into insignificance. It is reasonable to suppose that there is a biological, a neurological, basis for our extraordinary capacity to learn when we are very young. It probably has to do with the fact that our brains are still growing during the first few years of our life. It is striking that there are things that can only be learnt during this time. If we have not had the opportunity to learn to speak by the age of twelve, we will never really learn to speak. Lightning calculators all begin to acquire their extraordinary arithmetical skills when very young. Some things it seems become too difficult for us to learn as we grow older. In our early childhood we are forced, by our situation, to be creative philosophers and metaphysicians, preoccupied by fundamental issues. One only has to think of the endless questioning of young children to appreciate something of their insatiable hunger to know, to understand.

The tragedy is that formal education fails so dismally to recognize, and to help nourish, this frenzy of childish curiosity. At school we are expected to learn up items of human knowledge – solutions to other people's problems. It is rather rare to be told about, or to be asked to consider – let alone to be encouraged to wrestle with – the problems which gave rise to these solutions: and yet only this can enable us to make rational sense of the solutions themselves. It is even rarer to be asked to articulate our own problems, and our ideas as to how they might be solved. Worst of all, much education, unintentionally, makes us ashamed of our own intellectual integrity and creativity. At school a premium is placed on being able to understand quickly, and remember. We thus tend to grow ashamed of what we take to be our "stupidity" – our inability to understand, our puzzlement, our incomprehension. And yet it is precisely here, in our inability to understand, our sensitivity to the existence of problems, that our real intelligence and integrity lie. In prompting us to disown our inner stupidity, our lingering sense of bafflement, education encourages us to disown the precious core of our mind.

The result is that we come to devalue and forget our childhood discoveries. We do not appreciate even that the discovery of a problem can be a great intellectual achievement. We do not learn how to translate feelings of bafflement into articulated questions, into public words: and so memory of the bafflement is lost.¹²

The Physical Universe

By the time I was eight, my parents had decided, perhaps with a touch of amusement, that I was to be a "scientist". In those days, at the end of the second world war, to be a scientist was considered to be a highly desirable and honourable profession to aspire to – for a boy at least, and if only one was clever enough. In our family, however, science carried with it no special status or prestige: that went rather to literature, to the arts, to the creative and fulfilling life. But as far as I was concerned, it was not any kind of profession that was on my mind at all. My ambition, quite simply, was to solve the ultimate riddle, understand the ultimate nature of the universe, the nature of existence. To live and to die, and not know what kind of world this is, what it all means, seemed to me then, at the age of about eight, to be a fate too terrible to think of. Yet this, unfortunately, was the fate of everyone who had lived up till now. No one, I was convinced, had ever had the faintest idea of the true nature of the cosmos, the true inner meaning of it all. Most people were not even aware of the disaster of their ignorance. They lived and died unaware of the tragic triviality and irrelevance of their lives. Life

could only acquire its real meaning if one could clearly see and know. I had no choice: I must know and understand, as a matter of necessity. Where everyone else had failed, I must succeed. And when I discovered the great secret of the inner nature of the universe, I would reveal it to mankind, and be loved for ever.

At the age of ten, fired by this mighty and terrible ambition – in effect to become the saviour of mankind – I plunged into the study of nuclear physics! I devoured the contents of *Science News* 2 (1947), which was devoted entirely to an informal account of nuclear energy and the bomb, with contributions from Peierls, Bethe, Teller, Frisch and others. I understood enough to be worried about the possibility that an atomic bomb, exploded in the ocean, might turn the earth into another sun. In the great heat and pressure of the sun, I read, atoms of heavy hydrogen combine to form helium, a reaction that causes the sun to shine. If it happens there, I thought, it could happen here as well. And quite apart from that horror, there was the possibility of atomic war to think about. I made anxious calculations about our chances of survival if a bomb was dropped on Truro or Bodmin, living as we did on the north coast of Cornwall. Exploration of the inner secrets of nature brought with it, it seemed, both wonder and terror.

A year later I plunged into the study of relativity and quantum theory. With fascinated incomprehension I read Bertrand Russell's *ABC of Relativity* and Eddington's *The Nature of the Physical Universe*. I learned that as we move more quickly, we shrink, time goes more slowly, and we become more massive. Gravitation is simply the curvature of space-time. Everything is made up of electrons, protons and neutrons; but these fundamental entities, even though particles, are also, in some utterly mystifying way, wave-like in character as well, waves of probability. As a result of the investigations of science, the solid and prosaic world around us is revealed to be something utterly different, a place of dark miracles and mystery. It was above all my imagination that was appealed to by the utter strangeness of this world disclosed to us by modern physics. And buried within this mystery, this jabberwocky world, lay the solution to the enigma of existence. My intentions were, it seemed, becoming clearer. I would be a theoretical physicist, and discover the solution to the ultimate riddle of existence.

Around this time I read my first book of philosophy: W.A. Sinclair's *An Introduction to Philosophy*. This I read with interest, struck especially by the brief account of Hume's argument concerning the impossibility of knowing for sure that the sun will rise tomorrow, however many times it may have risen regularly in the past, and however firmly our most successful scientific theories might predict the occurrence. I realized, embarrassed, that I had somehow supposed that the authoritative body of scientists must be in a position to know such an obvious fact about the world in a way which placed it beyond all doubt – the universe, as it were, not daring to disobey the weighty judgement of the adult world. How absurd! Of course it could not be like that. It must of course always be possible for the universe to surprise people, however convinced they might be that this could not occur, however stiff and dignified they might be with certainty. I felt ashamed of my gullibility, and also interested that such an elementary argument could have such scope, such power to change the way one viewed things.

On the whole, however, I was not very impressed with philosophy. At the time, and for some years afterwards, it struck me as a game rather than as something serious. Not for one moment did I suppose that the solution to the mystery of existence, which I sought, could lie hidden in something as feeble as philosophy.

None of this, by the way, should be taken to mean that I was horribly precocious. Not at all. In those far off days in England, 11 year olds had to take an exam which decided whether they would be able to go on to grammar school or not. Failure to pass this exam more or less condemned you to leaving school without qualifications (unless your parents could pay for your education). I failed this crucial exam, not once, but twice!

The Human World

Then, with the arrival of the traumas, ecstasies and disasters of adolescence, I began to feel it was much more important to understand the hearts and souls of people, and the way to do that was by means of the novel. Instead of reading Jeans, Eddington, and Fred Hoyle, I plunged into the worlds of Dostoevsky, Jane Austen, Henry Fielding, Chekhov, Stendhal, D.H. Lawrence, Kafka, Virginia Woolf, Scott Fitzgerald, Thomas Mann, Tolstoy, Balzac, George Orwell, Turgenev, Conrad, Thomas Hardy, Ibsen, James Joyce, Mauriac, Bernard Shaw, George Eliot, Emile Bronte. I read *The Brothers Karamazov* in two days, emerging briefly, dazed and battered, from that turbulent and tortured world into thin reality for a bite to eat at lunch and supper. One afternoon I took a slim book by an unknown author up to my bedroom to read at a sitting; I was so astonished by its contents that I returned it hurriedly to the bookshelf, making sure no one noticed, as if the book were an obscene publication. It was Kafka's *Metamorphosis*. I hunted for books which would open up new worlds, so intensely imagined and so truthful that they would seem more vivid, more dense and real than the real world itself. What I wanted was not just the accurate depiction of this world, but the creation of a new, strange world experienced as reality. I marvelled at the early pages of Virginia Woolf's *The Waves*, Kafka's *The Trial*, Emily Brontë's *Wuthering Heights*, Dostoevsky's *The Idiot* and *The Brothers Karamazov*. Science fiction was for me only a cheap thrill. I read H.G. Wells' *The Time Machine*, and Stevenson's *Dr. Jekyll and Mr. Hyde*, gripped and fascinated: but for me neither book even began to engage in the proper task of the novel. What I sought was an exploration of the realities of human experience and emotion that was so truthful, so searching and profound, that we are led when we encounter it into a new vision of reality, a vision before only dimly and fleetingly sensed, so that we encounter it now in an overwhelming way as both strange and familiar, a wide awake dream. It occurs to me now that what I wanted was to be shown a world that was both as real and as mysterious as the universe of modern physics; but the reality and the mystery should lie in the human mind and heart, in our inner lives, and only incidentally, as it were, in any rearranging of the outer cosmic order. It was as if I believed reality must be utterly mysterious – whether the reality of the physical universe, or the reality of the human soul. Something of this I found in Kafka, and in Dostoevsky – and later on in Strindberg, and in the best films of Ingmar Bergman. And of course it is to be found in Shakespeare. And in Beckett.

My great ambition was transformed. By the age of fifteen I had no doubts, I would become a novelist. Clear sighted and unflinching, I would journey into the depths of the human heart and mind, into that cauldron of desire and terror, fantasy and nightmare we often pretend does not exist. I would capture the very essence of what it is to be conscious and alive – the intense inner feeling of oneself which we all know but do not know how to express. I would come up with the true inner meaning and value of our

lives, the precious essence of life. And the novels I would write would be revelations of these inner realities – so intense, vivid and dramatic as to be more real than reality itself.

My parents, however, insisted that, first, I must go to University, to secure my future economically (of no significance to me at all at the age of 17). The educational system, fiercely classificatory in those days, had labelled me "science" and not "humanities". (And in any case I knew doing English at University would ruin any chance I might have of becoming a novelist.) I had read Eddington, who informed me that physics is really mathematics, and for a time, earlier, I had been dazzled by this invisible, esoteric world of mathematics. So off I went to University College London to do mathematics, convinced I could write my novels between and after lectures.

But I was miserable; I didn't know what to write about; and mathematics seemed both hollow and very difficult. It did not seem to be about anything. I passed all my exams but, abruptly, in my second year, my grant was stopped because I had not attended enough lectures.

So I left and did my National Service in Bielefeld, Germany. I became a Sergeant in the Educational Corps. And then I went to Manchester University to do Philosophy. I had failed miserably as a physicist, and as a novelist, but I was interested in philosophical problems, so I would do that for three years, and then join the grey shuffle of ordinary, uncreative life (as I then saw it).

But before I plunge into an account of what happened as a result of going to Manchester, there is one other influence from my childhood that I must mention. The household god was Sigmund Freud. My mother had been psychoanalysed. Freud informed her vision of the world. But what I learned from her about Freud I found deeply disturbing. If my unconscious controlled my actions, this meant *I* was not in control. Free will was an illusion. Freud had to be refuted. But there did seem to be something to Freudianism. All too often what was supposed to be going on in human affairs seemed to me to be at odds with what was really going on. I decided the only way to refute Freud was never to deny an interpretation of my actions, motivations and feelings, however devastating that interpretation might be. As a result, my unconscious would gradually become conscious, and I would regain control of my actions and my life. Perhaps my adoption of this strategy to refute Freud accounts at least in part for the excesses that are to follow.¹³

Manchester University

At Manchester, in the first year, there were just two courses, both introductory: logic and philosophy. While still in Germany, I knew I would be doing something called "symbolic logic" at Manchester, but I had no idea what it was, and there were no books available to tell me. If I was to find out what it was, I was going to have to reinvent it myself. So I got hold of a big yellow army exercise book, and filled it with my efforts to reinvent symbolic logic. For months, I struggled to put Aristotelian logic into symbolic form, but got nowhere.

Then, at Manchester, I was introduced to the propositional calculus, and I was enchanted. It had never occurred to me to develop symbolic logic in such a fashion. The others doing the course were bored, but I was entranced and alive with questions. This episode came to dramatize for me what is so tragically wrong with so much education, at all levels. Our heads are stuffed with solutions to problems. Rarely are we told what the

problems are, in the first place – something we need to know to be able to assess, for ourselves, how adequate the proposed solutions are. Rarely indeed are we given the opportunity to struggle ourselves to attempt to solve fundamental intellectual problems – not with the idea that we might solve them, but simply to bring them to life, and to enable us to appreciate the wonder of the solution – if solution it be. Introductory courses in symbolic logic do not ask students to invent the subject. Almost never is a course organized around a major, open, unsolved problem – background knowledge and skills being acquired along the way, as a part of the effort to improve understanding of the problem and how it is to be tackled and perhaps, one day, solved.

The other course, introducing philosophy, I found less interesting. This was partly because I already had a background in philosophy, having earlier read works by G. E. Moore, Bertrand Russell, A. J. Ayer and others, and having thought about philosophical problems for years, without quite realizing it. But – perhaps for this reason – it turned out I was rather good at philosophy. At last, something I could do!

As my first year at Manchester came to an end, I became nightmarishly obsessed with two philosophical problems: the mind/body problem, and Hume's problem of induction. I threw my mind into a torment in connection with the first of these problems: how could a mere brain, a conglomeration of neurons and synaptic junctions, however vast and intricately designed, give rise to consciousness, to inner experience, to thought, feelings and perception, to our inner world? Was one to suppose that inner awareness arose as a kind of smoke from functioning neurons and synapses? Inner experiences, thoughts and feelings seem to be intrinsically and utterly different, in their very nature, from any conceivable neurological process to be found in the brain: and yet it also seems absurd to hold, with Descartes, that our inner experiences, our thoughts and feelings, are utterly distinct from anything to be found in the brain, there being two distinct kinds of stuff in the universe, the mental and the physical.

But as if this was not bad enough, there was also Hume's problem to torment me: what possible reason can there be for holding that things will continue in the future more or less as they have done in the past? How can our knowledge of the present and past be known to have any relevance for the character of the future? We cannot know anything about the future until it is here, as the present, or departed into the past. At any moment, for all that we can ever conceivably know, anything whatsoever may happen. We cannot argue that in the past the future has resembled the past, and hence in the future too the future will resemble the past, because this presupposes just what is at issue, namely that the past is a reliable guide to the future. At any instant, for all we can ever know, a teaspoon may become an elephant, or a daffodil an ocean, and it is just as sensible to hold that the teaspoon will in the next second be an elephant as it is to hold it will continue to be a teaspoon.

I found myself caught in a nightmare of contradictory impulses. On the one hand, the whole problem posed by Hume was clearly absurd: there must be some simple way of refuting Hume decisively. But I could not see what it could be. On the other hand, here I was trying to refute Hume when what had so appealed to me about Hume's argument, when I had first learnt of it as a child, was that it is absolutely correct, and beautifully puts humanity's pretensions into proper perspective by demonstrating conclusively that the natural world must always be in a position to surprise and confound the scientific experts, however infallible they may claim their expertise to be. Hume's argument

deserves to be affirmed and celebrated as providing liberation from the tyranny of expertise – and here was I, working against my instincts, furiously striving to demolish this wonderful and valuable argument as an absurdity.

The Riddle of Our Desires

My obsession with these two problems congealed into black despair. I arrived home for the Summer vacation. My despair, my sense of inner blackness, excluded all thought of a holiday. I decided that I would write. It was now or never. I took a job working in a factory during the day, and in the evenings, in a state of terror, I began to write short stories in one notebook and, in a second one, I jotted down thoughts and feelings just as they occurred to me – writing whatever I wanted to write, free of the crushing burden of attempting to create literature. This latter activity transformed my life. "The riddle of the universe", I wrote, "is the riddle of our desires" (and twenty years later this became the central theme of *What's Wrong With Science?*, *From Knowledge to Wisdom*, and much of my subsequent work). What had I wanted? Pushed to the extreme of absurdity, I decided, to become God. My desire to discover the ultimate nature of the physical universe and reveal it to humanity so that everyone could know and understand the ultimate truth about our world, our existence – what was this but the desire for omniscience, for immortality, the desire to be God? Buried within the scientific enterprise, it seemed, there were these passionate, desperate, absurd strivings – to acquire God-like knowledge and understanding, God-like power, to become immortal, to become God. And likewise my desire to be a writer of genius, chart the hidden depths of the human heart, create worlds of experience more vivid and real than reality itself, disclose for everyone to see the supreme inner meaning and value of human life, the miracle of our existence – what was all this again but the desire to be God? In literature too, it seemed, there were intense, desperate, concealed longings for God-like status.

And all this was an awful mistake. In my desperate desire to be a genius, to be God, I had lost sight of something infinitely more precious: to be myself. It was not the impossibility of becoming God that struck home to me so forcefully, as I scribbled away in my diary of thoughts and feelings, but rather the appalling and grotesque undesirability of it. For me, infinitely more miraculous than being God was being myself – this unique and extraordinary being which only I could be. In striving to become a genius, God, I had been striving to destroy myself. I had never seen myself – such a small, humble, short-lived phenomenon in cosmic history – as anything worth being, for its own sake. Now it seemed infinitely precious. And I had the sense of a foetus inside me, my embryonic self, frozen and withered from long neglect, now just beginning to stir, to grow, to feel and see, utterly sensitive and naked to experience.

For the first time in my life I passionately desired to be myself. But what was I? I did not know. It was a mystery. This long neglected, hitherto despised I was a stranger to me. I had for so long trampled on myself in my desperate attempts to escape from myself into becoming an immortal genius that I now did not know what my poor, trampled self could be. At times I experienced terror as I felt myself ceasing to be.

I invented a theory. For the first months of our life, I decided, it must be that we do not know how to divide up what there is into "me" and "not me". There is simply

"everything" – moving colours, sounds, feelings, pains and pleasures: a cosmos of experience. Then we discover how to separate out "that which is me" from "that which is not me": and we discover that we are a tiny, powerless being in a vast, all-powerful, largely unknown, sometimes terrifying universe. Dimly we remember a time when we were "everything", a time of blissful God-like status when the distinction between "me" and "cosmos" did not exist. In some way, so it seems to us, we have been disinherited of our rightful status in the scheme of things of being "everything". Without realizing what we are doing, we devote the rest of our life, in one way or other, to striving to attain again our original, proper status of being "everything". This is our due, our natural inheritance.

Two opposing strategies are adopted by people in their desperate struggles to become "everything". On the one hand people try to increase the size of the self, the minute "me", in the mad hope that eventually it will swallow up the entire universe – or at least as much of it as possible. Thus people strive to become more and more powerful, so that, by conquest, they come to dominate more and more territory, more and more people – until, eventually, pushed to the limit, the world itself quails before such all-commanding might. Others strive to increase the size of their identity by possessing more and more, enhancing the capacity to own by amassing wealth. Others seek to inherit the earth through their children – their progeny peopling the universe. Others again strive to become the universe by, quite literally, swallowing it up, obsessively and hopelessly eating and eating in an attempt to turn all that is "not me" into "me". And others seek to become the universe through science, through knowledge and understanding – the mind possessing, and even becoming, what is known and understood, the knower swallowing up and digesting even those vast cosmic tracts of space and time by knowing and understanding them.

On the other hand there are people who adopt just the opposite strategy: they seek to become "everything" by diminishing the self, the minute speck of "me", until it disappears altogether and only "everything" remains. This is the strategy of the mystic, who seeks the progressive annihilation of his self until it vanishes entirely, and there is only God: abrupt, ecstatic, devastating mystical union with God. It is the strategy, more generally, of all those Christians who strive to destroy their selfish self, strive to become humble and selfless, so that their will may become no more than the will of God, the self sunk into union with God by becoming a mere servant, a tool, a finger of God's purpose and presence in the world. It is the strategy of all those who endeavour to abase and annihilate their distinct identity before some vast "other", so that it becomes nothing but a part of, a servant of the "other" – whether this be God, the Church, the Nation, the race, the future, the people, or whatever. Even those who seek oblivion in alcohol, in drugs, in trauma, in madness, the self-knowing self being obliterated beneath the "everything" of sheer sensation and experience, adopt a version of the second strategy. The strategy is adopted implicitly even by those suicides who hope that by destroying themselves, they will become – everything: only the existence of the tiny self-knowing ego standing in the way, it seems, of the grandeur of becoming the cosmos.

These two strategies – to swallow everything up, and to be swallowed up by everything – on the face of it diametrically opposed, actually differ only in being different means to the same end: to become at one with God, with Nature, with Everything. Conquest and self-effacement, arrogance and humility, dominance and submission, selfishness and selflessness, apparent complete opposites, are actually but

two sides of the same coin. And we all, helplessly, without quite knowing what we are doing, in our urgent hunger to find reality and fulfilment, throw ourselves into living out our own particular version of one or other of the two strategies for life. The life-goal of becoming at one with everything is of course the outcome of extending our actual life goals to the extremity of infinity and insanity. Most of us massively curtail such a goal in the light of what we deem to be possible in the given hard constraints of real life. Only a minority of us, the insane, the mystics, the saints, the Hitlers and Stalins, can live out in actual life the fantasy of being everything – everything of importance. Nevertheless our wildest dreams and longings, projected to infinity, even if dismissed as childish or mad, can still influence our actual goals in life, our actual life strategies. What we actually do is the achievable residue of our infinite hopes. In our dream life we devote ourselves to being at one with God; and in the constricting circumstances of our actual life this becomes: to be head of the firm; to become blind drunk yet again; to publish yet another scientific paper; to achieve promotion; to perform an act of selflessness, of self-abnegation. Viewed from this perspective, our life is bound to seem frustrated and absurd.

And all this – so my theory asserted – is tragically unnecessary, the outcome of an awful mistake. It all rests on a grotesquely mistaken view of the nature of the self, a mistaken view of the relationship between that which is "me" and that which is "not me". Influenced by Christian conceptions of the soul, and the Cartesian conception of the Mind, we are led to conceive of our identity as a bubble of mind stuff which floats precariously within a vast, impersonal physical universe. It is not just that we discover that we are not "everything", but only a tiny vulnerable body within an immense world that is not us: worse still, we discover that we are not even our own body – our "me" being no more than the intangible mind stuff of consciousness floating somehow within the interstices of the brain. We are banished from the world, imprisoned within the bubble of our mind, all that we experience being no more than moving images within the bubble, caused by the utterly unknown, distinct physical world beyond, which will before long, and with complete indifference, crush us out of existence. Holding as we do, somewhere at the back of our mind, this nightmarish vision of being squashed up for life within the bubble of our mind, separated and excluded for ever from the utterly distinct world of Reality which lies beyond, we take up our mad life project of becoming at least a part of Reality, either by trying to swallow it up, or by allowing it to swallow up us.

But this Cartesian picture of the relationship between "me", my consciousness, and "that which is not me", the physical universe, is entirely wrong. That which is within us, our inner conscious self, is just as unknown to us, just as much a mystery, as that which lies without. The stuff of our inner experiences is as real and as mysterious as the stuff of apple trees, stones, or sunlight. We are not this unknown inner world – anymore than we are the outer world surrounding our bodies. We are the outcome of the interaction between inner and outer worlds. We are as much the trees, the sky, the sounds of our footsteps scrunching on gravel, the action of walking in the world, as we are our experience of these things, located within our skull. Our identity is not made of mind stuff, utterly distinct and separate from the material world: rather our identity is the interaction between the world out there, and what lies within. Our identity is naked to the world. We become what we see, and hear, and touch, and do.

But as a result of conceiving ourselves to be utterly distinct from everything else, the easy flow of identity between what is within and without is disrupted. Desperate, hopeless attempts to become at one with Reality by trying either to swallow it up, or to get it to swallow up us, only make matters worse. The clenched muscles of our identity impose an even more restrictive barrier between our inner and outer worlds.

The crucial step is to recognize that there is a third way. In order to become ecstatically at one with Reality, to as great an extent as we please, all we need to do is to relax our clenched muscles of identity dividing off so artificially "me" from "not me", and we discover ourselves in the easy interplay between what is within and without. We will discover ourselves to be what we already are: a part, an aspect of, Reality. Strenuous, hysterical and hopeless attempts to conquer or be conquered will fall by the wayside as we participate in the miraculous richness of Being.

This was my theory. It contains the seeds of the ideas of my subsequent work. In an emblematic but confused way, almost all the themes are there: emphasis on the need to call into question the aims of science and the aims of life, and the importance of relating the one to the other; the fundamental character of the problem "What is of value in life, and how is it to be realized?"; the need to change philosophy so that it takes up as its basic task to help us improve our solutions to this problem as we live; the importance of trying to understand human life as we enjoy and suffer it, imbued with meaning and value, as an integral part of the physical universe; the idea that experiential features are real features of things out there in the world, all views which deny this, from Cartesian dualism to physicalism, being wrong; the sense that being alive is a miracle – that which is of supreme value in existence lying in the rich particularity of our lives here on earth.

There is of course much to criticize in my "theory". Indeed, I subjected it to fierce criticism myself in ensuing years, and was able to develop my views as a result. But when I first enunciated it, in the Summer of 1961, it came to me as a revelation, as a solution to the riddle of existence. Not only did I believe passionately in my theory; I lived it. What I thought of as my great discovery – that in order to realize what is of supreme value in existence we need to forego attempts to possess, or become possessed, and instead allow our self to emerge naturally as the interaction between unknown inner and outer worlds – this great "theory" of mine was but the intellectual husk of what I lived, what I experienced. In the space of a week or so, almost everything had changed. My black despair had gone. I found myself a new person in a new world, vivid, dramatic, sometimes terrifying. Now that for the first time in my life (so it seemed) I wanted to be myself, but did not know what this unknown, mysterious thing "myself" could be, during each day I found and lost myself a thousand times as I became and ceased to be what I saw, felt, heard, did or became a part of. Every morning just before sunrise, I set off for a long walk though the beautiful Hampshire countryside in which my parents' house was situated. As the sun rose, it felt like the first day, the beginning of existence. Everything was indescribably fresh. I was newly created: and being myself, whatever it might be, seemed to be a wonder, something sacred. As I walked, I would lose myself in the changing perspectives of trees, hedges, hills and sky: and the landscape would lose itself in me. I experienced the dissolution of the barriers between "me" and "not me", so that at times it seemed it was the landscape walking me though it, there being simply changing perspectives of landscape. And then I would run, frightened that I was about to dissolve away altogether, lose myself permanently to these trees, fields and sky, and go mad. And

throughout the day I would find and lose myself in the changing circumstances of my surroundings. In one of his letters John Keats remarks "if a sparrow were before my window, I take part in its existence, and pick about the gravel". So it was with me. I would meet two friends for five minutes conversation, and I would become this meeting, this conversation. This would be everything, my whole identity. And when the meeting came to an end, I would experience the terror of dissolution of self, until I found a new self in what happened next. Whereas before I had been shut up in my solitary Cartesian prison, utterly excluded from the real world, surrounded by the impersonal, unknown physical universe, I was now released into a world rich in colour and drama, my identity as much in things around me as in my body or brain, passionately and helplessly becoming and ceasing to be the things I experienced. I can remember staring at a stalk of grass: never had there been such vividly green grass; and this was not some object remote from me about which I could only obtain distant, misleading clues through perception or touch; as I stared at it I became it, or it became me. I knew the stalk of grass from within itself.

And it was not just things that I met in this raw, absolute way; it happened with people too. Whereas before I had been locked away from others by my terror of being known and annihilated, I now plunged into communication with others, friends and strangers alike, with reckless, uncalled-for intensity, convinced that there could be nothing more important than that we should know each other without reservation while so briefly and miraculously alive. I sought intimacy swiftly and unselfconsciously, entirely unperturbed when this led to embarrassing or absurd consequences. On one occasion, in London, a friend took me back to the house he shared with others. We entered the living room together: my friend's fellow lodgers, all complete strangers to me, were watching television. I strode across the room and, without a moment's thought, turned the television off, quite sure that meeting each other was of infinitely greater significance than watching flickering images on a screen in silence.

Up till now I had instinctively presumed, without quite realizing it, that that which is of supreme value in existence must be something hidden and remote, buried deep in the structure of the cosmos, or in the intricacies of the human psyche. Now I experienced supreme value as something brazenly apparent in my immediate surroundings, as something I could see, touch, and become a part of. What hitherto I had only had a glimpse of in isolated, battering moments of ecstasy and terror, I now endured as a day by day reality, it being the new world in which I found myself. It was as if I had had my familiar self and world dissolved away by some psychoactive drug, and I now experienced reality naked and raw – except that there were no hallucinations, and the whole experience lasted, not for a few hours, but for six weeks.

One point still worried me: the megalomania of philosophy, in which I seemed to be caught. Scientific impulses to know and understand, and artistic impulses to create, might contain within them secret, unacknowledged desires to acquire God-like status: but in the case of philosophy, the desire to become God seemed blatant, horrifying and grotesque. The great philosophers were, I felt, little better than would-be great dictators, who tried by intellectual means to establish absolute power over humanity for ever. Each philosopher dreamed up his own personal vision of how he desired the universe, life and society to be, and then sought to foist this personal vision onto the rest of us by arguing that reason alone proved the vision to be true, the one and only absolute, objective reality.

The philosophical picture of reality is not put forward honestly as a personal wish or dream, as a suggestion or proposal, a possibility open for the rest of us to consider, to accept, reject or modify as we please. It is put forward as final Truth established and authenticated by mighty Reason for ever – Truth that we are all obliged to accept and adopt. By means of this trick of dressing up what he desires as the commands of Reason alone, the great philosopher seeks to hypnotize humanity intellectually, so that the rest of us come to believe, value and do what he desires and dictates. Under the impression that we are observing the edicts of reason, we quietly become the great philosopher's slaves.

Plato – generally acknowledged to be one of the very greatest of philosophers – seems an especially blatant case in point. In *The Republic*, Socrates argues on behalf of Plato that society must be organized in the way the philosopher deems to be right, for he alone – via his intellectual perception of the entities of mathematics – has perceived the Form of the Good and thus is able to know what constitutes the good society. In brief, he, Plato, needs to be given absolute power for he, alone, knows what is good for the rest of us.¹⁴

Plato is perhaps an extreme case. I felt however that the Platonic lust for power, the Platonic urge to become God, concealed beneath a smokescreen of professed wisdom, was inherent in the very enterprise of philosophy itself, as traditionally conceived. For not only Plato, but other philosophers too, traditionally try to show that a personal vision of how things are and ought to be is the unique and absolute Truth, decreed by Reason, which ought to be accepted as such by humanity for ever. What is this but the attempt to become the dictator of humanity by intellectual means?

All this might horrify me: but was not I also guilty of just such a dictatorial project? After my (admittedly highly anti-Platonic) mystical experience of reality, did not I now desire to tell humanity of my great discovery? For had not I discovered the solution to the great riddle of existence?

Recoiling in horror from this realization, I decided that in future we cannot possibly put our trust in the rare great philosopher or prophet: we must all become prophets. We must all make up our cosmos, our life, our world of value, for ourselves and each other. We are all philosophers, even as children. A vital part of the intellectual deception of the great philosophers – the would-be great dictators – is to fool us into thinking that philosophy is a highly abstruse field, much too difficult for most of us, our confidence in our capacity to think for ourselves thus being undermined. This is a crucial step in Plato's argument. Much subsequent education, right down to the present, conspires to make most of us lose rather than gain confidence in our capacity to think responsibly and seriously about fundamental issues for ourselves. And experts of all kinds – scientific, medical, technological, religious, academic, even political – seek to cloak their expertise in jargon so that it is incomprehensible to the layman, thus further undermining our confidence in our ability to judge and know for ourselves. This vast, elaborate conspiracy to deprive us of our wits, our capacity to know and understand our world, must be resisted. What we urgently need is a democracy of prophets.

But was not I still a kind of would-be intellectual dictator, in preaching this great message that we must all be prophets, and make up our world as we live? For here was I, a kind of privileged meta-prophet, dictating to humanity the great Truth that we are all prophets.

It seemed to me that the only way this final dreadful charge of intellectual dictatorialism could be avoided was to abolish absolute Truth itself. There are stories, myths. The great mistake is to take any one story to be *the* story, *the* absolute Truth, Reality itself. It is the everlasting temptation to do this which creates the impossible problem of how to reconcile the physical universe with our human world as we experience it. We suppose that the scientific myth is the Truth, Reality itself: and then we are confronted with the impossible problem of accommodating all that science leaves out: sensory qualities of things, thoughts and feelings, meaning, freedom and value. The solution is to reject the initial premise. Science does not provide us with a privileged access to Truth and Reality: the scientific conception of the world is one myth amongst others, in some respects better than others, in other respects worse. Scientific entities like electrons and protons are fictional objects like gods: useful for certain purposes, but not to be taken too seriously.

I thus lapsed into a kind of relativism. Nevertheless, convinced that I had made discoveries of momentous importance – above all, that the riddle of existence is the riddle of our desires, philosophy being about the vital problem of what we should do with our lives – I was eager to return to Manchester to astound my philosophy mentors with the intellectual riches I had stumbled across. Academic philosophy was not the tedious discipline I had so far encountered, concerned only with sterile problems of dead knowledge: it was vital and alive, charged with personal experience, ready to grapple with urgent and basic problems of life.

Back at Manchester, I found I could not open my mouth. The dramatic and vital enterprise that philosophy had now become for me seemed to have no connection whatsoever with philosophy as conducted in the Department at Manchester University. The idea that philosophy might have something to do with life, with the great mysteries of existence, with problems of living in the real world, seemed to be grotesquely out of context in the Philosophy Departmental Seminar at Manchester. Merely to take philosophy seriously seemed laughable. The rich and extraordinary world that I had discovered that Summer began to fade away. My mouth was full of concrete, and I could not speak. I began to despair.

In the third year, things became really grim. The course became devoted to Oxford philosophy, which struck me as the absolute nadir of what philosophy might be. The proper task of philosophy is to articulate our most urgent, general and fundamental problems – problems of thought and life – and propose and critically assess possible solutions, or at least help keep alive this vital activity. Oxford philosophy, and much analytic philosophy which stems from it, quietly denies, by implication, that any such activity is possible for philosophy at all. For it is implicitly – and idiotically – taken for granted that philosophy cannot be about problems that concern the real world, because philosophy is not empirically based. Hence, philosophy can do no more than analyze concepts. Not only does this deny to philosophy the very possibility of its proper task. It condemns philosophy to intellectual dishonesty. For the results of conceptual analysis are presented as being no more than conceptual clarification. But inherent in the meaning of words there lurk factual, metaphysical, value and even political assumptions. Such assumptions must be implicit in the supposed “conceptual clarifications” of analytic philosophy – even though this will, of course, be denied. Thus Gilbert Ryle, in his *The Concept of Mind*, claims merely to analyze mental concepts. Actually, the book

insinuates the doctrine of behaviourism, but this is done in a covert and dishonest fashion, and is explicitly disavowed.¹⁵ The absolute pits of Oxford philosophy, for me, was J.L. Austin's *Sense and Sensibilia*, so smugly and idiotically reducing the problem of the nature of reality to the meaning of the word "real".¹⁶

I was so appalled by Oxford philosophy, and so frightened of becoming indoctrinated by such rubbish, that I stopped attending lectures entirely, but nevertheless managed to pass the final exam, and obtain my degree.

MA Thesis, Karl Popper, and J. J. C. Smart

I decided to spend two years attempting to capture in an MA thesis what I had discovered in the Summer of 1961, and then somehow mislaid in my despair at not being able to open my mouth about it. I still had this sense I had discovered something of profound significance, even though I now felt I no longer knew quite what it was. My thesis, I decided, should tackle the problem of how to reconcile the two worlds of my megalomaniacal youth: the universe of physics on the one hand, and the human world of common sense, of experience, consciousness, meaning and value on the other. My initial idea was that these should be treated as two *myths*, two stories, neither to be taken too seriously as the one and only *truth*.

But then I discovered work by Karl Popper, and in particular his argument that we cannot verify scientific theories, we can only refute them. I was impressed. This was close to my own view of the matter, but also subtly different. Popper was a firm believer in truth, even though he also thought it was very difficult to get hold of. Physics, for Popper, very definitely, was not one story amongst others, no more or no less valid than others. As a result of reading Popper, my whole view of the task of philosophy was transformed.

Up till then my approach to philosophy was to take a problem – "Do we see stars?", "Is the mind the brain?" – and write a kind of mini drama, invisible protagonists deploying arguments for and against. In this way, I thought, one could acquire philosophical insight. For Popper, this was clearly no good at all. One should begin with a serious, open, difficult problem (excellent!) and one should try to solve it. One should try to get at the truth of the matter, even though this might be very difficult, and even though, even if one did solve the problem, one could have no assurance that one had definitively solved it. All our knowledge, all our attempted solutions, can only be, for ever, guesses, conjectures. And one should find out about the history of attempts to solve the problem, assess critically past attempted solutions, and then attempt, if possible, to do better. Above all, one should write in as simple and clear a way as possible, avoiding all jargon and technicalities, unless they proved absolutely necessary.

This passage of Popper's in particular made a big impact:

The belief of a liberal – the belief in the possibility of a rule of law, of equal justice, of fundamental rights, and a free society – can easily survive the recognition that judges are not omniscient and may make mistakes about facts and that, in practice, absolute justice is hardly ever realized in any particular case. But this belief in the possibility of a rule of law, of justice, and of freedom, can hardly survive the acceptance of an epistemology which teaches that there are no objective facts; not merely in this particular case, but in any

other case: and that the judge cannot have made a factual mistake because he can no more be wrong about the facts than he can be right.¹⁷

I found this argument utterly convincing. It was actually profoundly immoral not to believe in objective factual truth, the world of objective fact, existing independently of us, whether we were aware of it or not. It was just this, I realized, ashamed of myself, that I had abandoned with my view that there are just stories, no one story having the right to claim to be *the* story, the one *true* story. The world exists, whatever stories we may make up about it. Many are false. Some parts of some are, no doubt, true, in that what they say to be the case, really *is* the case. Far from stories swallowing up the world, stories are just a tiny bit of the vast universe which exists entirely independently of what we think about it, apart from the tiny bit of the universe that happens to be ourselves.

I would have to revise entirely my hopelessly inadequate attempted solution to my problem. I decided that the worlds of (1) physics, and (2) the experiential, are not different *stories*, neither having the right to claim to be *true*. Rather, they are concerned with different *aspects* of all that there is. The problem now became to pin down exactly *what* aspect each is concerned with, and what, exactly, prohibits physics from saying anything about the experiential aspect.

I became an occasional student at the LSE, and attended Popper's lectures and seminars. I was immensely impressed with the originality and clarity of what he had to say. His incidental remarks seemed to me to demolish casually whole swathes of received views, public opinion and prejudice. He spoke against the idea that the future will decide about the merit of works of art. He characterized a great deal of contemporary philosophy as amounting to no more than a "word salad": words are tossed about, but nothing substantial is achieved. He stressed, again and again, the importance of beginning with a statement of one's problem. He pointed out that critical rationalism is relevant even in the arts. An artist tries things out, criticizes what he has done, tries again, and so on until what has been done is deemed sufficiently good to survive.

I read Popper's *The Open Society and Its Enemies*, and quite literally wept with relief and joy. At last I had found a work of philosophy that had profound things to say about a profound problem: the severe difficulties that face the open, liberal society, even some of the most revered thinkers, above all Plato and Marx, being enemies of it. I was especially impressed with the way Popper was able to show that the rational society *is* the open society (highly relevant to ideas I was subsequently to develop). Given pre-Popperian conceptions of reason, one might suppose that the rational society would be a grim dictatorship of reason, rigidly controlled by rules of reason. Once one accepts Popper's critical rationalist conception of reason, however, it becomes clear that the rational society is a society in which criticism flourishes, which in turn requires toleration of diversity of views and values, which *is* the liberal, open society. There could not be a greater contrast with the spurious trivialities of Oxford philosophy. I remember thinking in one of his lectures: 'This man is a great philosopher, an historical figure, standing in line with David Hume, Immanuel Kant, John Locke and Rene Descartes'.

Later, I came rather to pity Popper. He had had this profoundly important idea. Theories cannot be verified in science, they can only be falsified: nevertheless, it is this that makes scientific progress possible, and so incredibly successful. This process of subjecting theories to ferocious attempted falsification can be generalized so that,

whatever we are doing, we can hope to make progress if we subject ideas – attempted solutions to problems – to ferocious criticism. I had no doubt about the importance of the idea – its widespread implications. And yet it seemed to be extraordinarily difficult to get the significance of the idea widely appreciated, not because the idea is esoteric and difficult to understand, but the exact reverse, because it is so simple. In those days, around 1964, few philosophers thought much of Popper. One or two famous scientists admired his work: Peter Medawar, Hermann Bondi, John Eccles. The public had never heard of him. I saw Popper condemned endlessly to repeat himself, endlessly and hopelessly condemned to trying to tell the world of the fundamental importance, for all that we do, of subjecting our imaginative ideas to severe critical scrutiny. Never, never, I vowed, must I allow myself to suffer a similar fate.

And at the time I did not think it was remotely likely that I would, because I had become convinced that Popper had essentially sorted out the fundamental problems of philosophy – the fundamental problems with which I had been so agonizingly obsessed. I heaved an immense sigh of relief. I no longer had the sense that I had discovered and lost something of profound significance for humanity which I must try to recover, articulate and put into the public arena. Popper had done it – or would soon have done it, I reckoned, when people woke up to the significance of his work. I could relax. There were, it is true, a few questions Popper had not discussed, in particular my problem concerning physics and common sense, the experiential world. There was still something for me to do. But this was little more than pottering about on the sidelines. It did not concern the epoch-making matter of the future of humanity.

Back in Manchester, I discovered another excellent book: J.J.C. Smart's *Philosophy and Scientific Realism*. This defended *physicalism* – the doctrine that the universe and everything in it is made up exclusively of the fundamental entities of physics: electrons, protons, neutrons and photons, or whatever these entities might be. The experiential world, thoughts and mental processes, aesthetic and moral qualities: all these are nothing but physical processes that are, ultimately, interactions between the basic entities of physics. Nothing but physics exists.

Not for one moment did I believe this. But I found Smart's book admirable, because of its clarity, its lucid exposition and defence of an important thesis, and its refusal to have anything to do with the sophisticated absurdities and dishonesty of Oxford analytic philosophy. In one bound, Smart had broken the idiotic convention that philosophy has nothing to do with the real world. He defended brilliantly a sweeping doctrine about the real world.

His book provided me with just the framework, the background, I needed for my thesis. I could devote much of my book to demonstrating what was wrong, or inadequate, in Smart's physicalist doctrine, and what one needed to put in its place. Physicalism, in my view, was absolutely correct as long as one did not claim, as Smart did, that everything comes within the scope of physicalism. It provides us with a picture of an aspect of what there is, but does not tell us about *all* that there is.

My task, as I have said, was to pin down exactly *what* aspect the physical, and the experiential, are concerned with, and what, exactly, prohibits physics from saying anything about the experiential aspect.

Physics, it occurred to me, seeks to *predict*. It is concerned only with that aspect of things which determines the way events, or isolated systems, evolve in time and space.

As I wrote, something entirely unexpected and rather extraordinary occurred. Out of the tip of my biro, as I scribbled, had come, entirely unforeseen, a decisive refutation of one of the pillars of modern philosophy, one of its strongest, best established doctrines. I refer to Hume's account of causation. Hume had argued that there could not be any kind of *necessary connection* between cause and effect. Nothing in one event, at one moment, could possibly determine, with necessity, what occurred at the next instant. I discovered that we must be even more epistemologically modest than Hume. For all we can know, necessary connections between successive states of affairs may well exist. Indeed, it is precisely the task of physics to try to discover what such a necessary connection may be. Theoretical physics seeks to discover *necessitating properties* of fundamental physical entities. If an electron is electrically charged then, *of necessity*, it will accelerate in a prescribed way when placed in an electric field. Indeed, all ordinary physical properties – solidity, rigidity, opacity, and so on – carry implications about how the object that possesses the property will, of necessity, *change*, or *resist* change, in certain circumstances.

Physics, then, is exclusively about what may be called the *causally efficacious* aspect of things, that aspect which everything has in common with everything else, and which determines *necessarily* (but perhaps probabilistically) how events unfold. Everything not required in order to predict how events unfold - the experiential aspect of things – will be ignored by physics. Given *any* isolated system – any physical system isolated from all influences from outside – physics seeks (in principle) to be able to predict how that system evolves, given a specification of its state at some instant. But physics is only interested in predicting specifications of the state of the system *when described in the same terms, in order to predict further states of the system*. Physics is thus not interested in predicting *everything* about the system. If it contains a conscious person who sees a yellow daffodil, has the visual experience of seeing the yellow daffodil, thinks ‘that’s a daffodil’ and then says “that’s a daffodil”, then physics will (in principle) describe the *physics* of all this: the molecular structure of the daffodil, the light reflected from the daffodil, the nerve impulses that travel up the optic nerve and around the brain of the person, the contraction of muscles, the sound waves emitted from the vocal chords and the mouth. But *what the daffodil looks like, what it is to experience seeing the yellow daffodil, what it is to think ‘this is a daffodil, and what “this is a daffodil” means*, all this is ignored by physics because ignoring it does not in any way undermine its predictive task.

But it went further. It was not just that physics did not need to specify experiential qualities to achieve its predictive task successfully. I discovered an argument which showed conclusively that physics could not predict the experiential features of things, even if it wanted to (as it were). All physical statements – all physical concepts – are such that you do not need to have had any special kind of experience in order to understand them. Being blind from birth does not debar you from understanding the whole of optics, or the wave theory of light, just as well as any sighted person. But when it comes to experiential features, all this is dramatically different. If you are to know what “yellow” means, or what it is to assert “that daffodil is yellow”, then you do, at some time in your life, need to have experienced the visual sensation of yellowness. A person blind from birth is not thereby debarred from understanding any part of physics, but he is debarred from knowing what it is that “This daffodil is yellow” asserts. This

means that no conglomeration of statements of *physics* can ever imply a statement such as “This daffodil is yellow” where “yellow” is understood to refer to the perceptual or experiential quality, what we normally sighted people see when we see daffodils.

The silence of physics about colours, sounds, smells, tactile qualities as we experience them does not mean that these experiential qualities do not really exist out there in the world around us. All it means is that these qualities are just the sort of properties that physics does not need to specify, predict or describe in order to fulfil its predictive, explanatory task. And furthermore, even if physics wished to predict these experiential qualities, it could not, because physics is such that no special kind of experience is required to understand it, but experiential qualities are such that special kinds of experiences *are* required to understand them, know what they are.

And precisely the same considerations arise in connection with our inner experiences. The silence of physics about our inner experiences, our thoughts and feelings, does not mean that these mental features do not really exist. All it means is that these mental features of brain processes are just the sort of features that physics does not need to specify, predict or describe in order to fulfil its predictive, explanatory task. And furthermore, even if physics wished to predict these mental features of our brain processes, it could not, because physics can be understood without one having to have any special kind of experience, whereas the mental feature of brain processes are such that you do have to have, in your own brain, just those brain processes in order to know what the mental features of those brain processes are.

I had solved my problem of specifying precisely what *aspect* of things physics is concerned with, and what *aspect* of things common sense, or the human world view, is concerned with. I had solved the problem of understanding how our human world, full of experiential qualities, could exist embedded in the physical universe.

And I had done more. Not only had I refuted Hume on causation. I had solved the philosophical part of the mind/brain problem. I had demonstrated, indeed, that the mind/brain problem is, in important respects, similar to the “yellow daffodil/daffodil as physical object” problem.¹⁸ (Few philosophers today appreciate that the so-called hard problem of consciousness was solved long ago in 1965, the year I finished my MA thesis.)

All this gave precision to the explosive discovery I had made in the Summer of 1961 that Cartesian dualism is wrong, mental or experiential features exist in the world external to us as well as within us, that we are, in a sense, as much a part of the world external to us as within us, and our inner world is as mysterious to us as the world external to us.

Some years later, I argued that, not only experiential features, but value features too exist in the world around us, the latter perceived (fallibly) by our emotional responses to things.¹⁹

I wrote up my thesis, obtained my MA, and published three papers, in 1966 and 1968, which spelled out what I had discovered.²⁰ I assumed that these papers would have an explosive impact on philosophy. Not at all. There was absolute silence.

However, eight years later Thomas Nagel published ‘What is it Like to Be a Bat?’, and twenty years later Frank Jackson published ‘What Mary Didn’t Know’.²¹ These papers did no more than express, perhaps in a somewhat more vivid way, a fragment of what I had argued for in 1966 and 1968.²² Unlike my papers, however, they had an immense

impact, not only on philosophy, but on psychology, cognitive science, artificial intelligence and neuroscience as well. Decades later, in 1999, I wrote to Nagel and Jackson to ask them if they had come across my papers – and I sent copies. Nagel replied with great generosity “There is no justice. No, I was unaware of your papers, which made the central point before anyone else.” Jackson admitted he had read my “Understanding Sensations”. In his case, something close to plagiarism (of idea, not words) is involved. Some time later I met Jackson, and raised the matter with him. He said he had now abandoned what tends to be called “the knowledge argument”. So, having taken credit for my work, he had now repudiated it!

As for my Hume paper, some years later Fred Dretske, Michael Tooley and David Armstrong²³ published work along somewhat similar lines, again without any reference to, or apparent awareness of, my much earlier paper.

Does any of this matter, apart from my personal pique at not getting recognition for my work? At the time, I was unconcerned but now, in retrospect, I am not so sure. In both cases, only a bit of what I had argued for came to the attention of philosophers. Most of what I argued for is still ignored by, and unknown to, most philosophers. What I have done since in developing these ideas has been ignored as well.²⁴ As for my Hume paper, subsequent work by others suffers from failing to reproduce key points of my argument. In 1989, Bas van Fraassen criticized anti-Humean accounts of physics on the grounds that if physical laws are necessary, they cannot be empirical, if empirical they cannot be necessary.²⁵ This criticism is lethal against the views of Dretske, Tooley and Armstrong, but does not apply to my 1968 paper, which van Fraassen does not mention. In my paper, I stressed that physical theories need to be interpreted so that physical laws are analytic, and so necessary, all the factual content of the theory being concentrated in the assertion: such and such entities exist with such and such necessitating properties.

From my own personal standpoint, by far the worst consequence of the neglect of my first three publications was that when, a few years later, I really did have something important to communicate, concerning the future welfare of humanity, I failed. If my early work had received the recognition that was its due, later far more important work would undoubtedly have won far greater attention. I would not have had to struggle for decades to get it noticed, and still fail, even today.

London and the Comprehensibility of the Universe

After obtaining my MA, I taught philosophy of science in the Philosophy Department at Manchester for a year. Then, in 1966, I got a job teaching philosophy of science in the Department of History and Philosophy of Science at University College London, where I remained until my early retirement in 1994.

In London, I took up three projects: (1) to write a book expounding my solution to the human world/physical universe problem (encapsulated in my MA thesis and first three papers); (2) to develop a fully micro-realistic, fundamentally probabilistic version of quantum theory; and (3) to assess the validity of criticisms then being made of Popper’s views about science. The first project fell by the wayside.²⁶ The second led to a long sequence of papers which did result, finally, in a micro-realistic, probabilistic version of quantum theory free of the defects of the orthodox version, able to solve the quantum wave/particle problem, and empirically distinct from the orthodox version (although not yet, as far as I know, put to the test of experiment).²⁷ The third project led to my

profound discovery – or what I cannot help but see as a “profound discovery”: the urgent need to transform academia so that it gives intellectual priority to our problems of living, and devotes reason to the task of helping humanity make progress towards as good a world as possible.

Aware of the criticisms swirling around Popper’s work, in part because of a review I wrote for *Nature* of a book comparing and contrasting Kuhn and Popper,²⁸ I decided to write a paper in which I would work out, for myself, whether any of these criticisms really struck home.

According to Popper, as everyone knows, science cannot verify theories, but can only refute them. This sounds very negative, but actually it is not, for science succeeds in making such astonishing progress by subjecting its theories to sustained, ferocious attempted falsification. Every time a scientific theory is refuted by experiment or observation, scientists are forced to try to think up something better, and it is this, according to Popper, which drives science forward. Thus, in order to maximize the chances of progress, scientists should put forward theories that have as much empirical content as possible, and are thus as vulnerable to empirical falsification as possible – these theories then being subjected to severe attempted empirical falsification. The best that we can hope for from science is theories that have survived such a ferocious empirical onslaught.

I entirely endorsed Popper’s point that we cannot verify scientific theories; we can only falsify them. I had grasped this point, in essence, as a child when I first learnt of Hume’s arguments concerning induction and causation. Criticisms of Popper made by Kuhn, Feyerabend, Lakatos and others did not seem to me to be too serious.²⁹ What did seem to me to be serious, however, was Popper’s failure to do justice to the fact that science only ever accepts theories that are *unified*,³⁰ or *explanatory*. As I have indicated, Popper holds that that theory should be accepted which has the highest empirical content and has survived the severest onslaught of attempted refutation, thus being best corroborated. Given an accepted *unified* theory, T, we can always formulate a rival, T*, which has higher empirical content, and is better corroborated, by adding onto T independently testable, tested and corroborated conjectures.³¹ In general, however, T* would be horribly *disunified* and, quite properly, would not be considered in scientific practice for just that reason. Popper’s methodology thus persistently recommends acceptance of theories that would never be considered in scientific practice for a moment. His methodology is refuted.

Popper tried to overcome this difficulty by arguing that a high degree of simplicity (or unity) is the same as high empirical content. But what the above indicates is that this is not the case. We can increase empirical content and at the same time drastically *decrease* simplicity, or unity.

Subsequently, Popper proposed that an acceptable theory "should proceed from some *simple, new, and powerful, unifying idea*".³² This does much better justice to scientific practice. But this “requirement of simplicity”, as Popper calls it, contradicts the rest of his methodology. It contradicts the requirement that we should accept that theory which has the greatest empirical content and is best corroborated – which, as the above argument shows, can invariably be concocted to be a T*-type theory, horribly *complex* and *disunified*.

Quite properly, then, scientists only accept *unified, explanatory* theories even though better corroborated *disunified, non-explanatory* rivals can always be formulated. But Popper cannot provide a rationale for this procedure. He cannot explain why this procedure gives us the best hope of achieving scientific progress. Such a procedure is only a sensible one to adopt, so it would seem, if we have good reasons to accept the *metaphysical* thesis that the universe is such that a unified pattern of law governs phenomena. If the universe is not like that, and basic laws are *disunified*, then adopting the procedure will block progress. Popper, however, cannot appeal to such a metaphysical thesis. He excludes metaphysics from science.

Then it dawned on me – and it was a definite moment when I had this revolutionary idea: the only way to make sense of science is to see the whole enterprise as accepting, as a basic item of (conjectural) scientific knowledge, that the universe is such that there is some kind of unified pattern of physical law running through all phenomena, the universe being, in this sense, physically comprehensible.

In one respect, Popper's conception of science is highly unorthodox: all scientific knowledge is conjectural; theories are falsified but cannot be verified. But in other respects, Popper's conception of science is highly orthodox. For Popper, as for most scientists and philosophers, the basic aim of science is knowledge of truth, the basic method being to assess theories with respect to evidence, *nothing being accepted as a part of scientific knowledge independently of evidence*. This orthodox view – referred to above as *standard empiricism* – is, I realized, *false*. The fact that physicists only ever accept *unified* theories even though endlessly many empirically more successful *disunified* rivals can always be concocted, means that science makes a big, permanent, and highly problematic assumption about the nature of the universe independently of empirical considerations and even, in a sense, in violation of empirical considerations – namely, at the very least, that the universe is such that all grossly *disunified* theories are false. Without some such presupposition as this, the whole empirical method of science breaks down.

Suppose physicists only ever accepted theories that postulate atoms, even though many empirically better corroborated theories are available which postulate other entities, such as fields. It would be clear that physicists thereby make the assumption that the universe is made up of atoms, whether this is acknowledged or not. Just the same holds in connection with physicists' persistent acceptance of *unified* theories, even though empirically better corroborated *disunified* rivals are available. Physicists thereby make the assumption that there is some kind of underlying unity in nature, whether they acknowledge this or not.

Popper, along with most scientists and philosophers, had misidentified the basic aim of science. This is not truth *per se*. It is rather truth *presupposed to be unified*, presupposed to be explanatory or comprehensible (unified theories being *explanatory*). Inherent in the aim of science there is the metaphysical – that is, untestable – assumption that there is some kind of underlying *unity* in nature. The universe is, in some way, physically comprehensible.

But this assumption is profoundly problematic. We do not *know* that the universe is comprehensible. This is highly *conjectural* scientific knowledge. Even if it is comprehensible, almost certainly it is not comprehensible in the way science presupposes it is today. For good Popperian reasons, this metaphysical assumption must be made

explicit within science and subjected to sustained *criticism*, as an integral part of science, in an attempt to improve it.

The outcome is the *aim-oriented empiricist* conception of science I have indicated above.³³ This facilitates progressive improvement of problematic assumptions inherent in aims by representing aims, and associated methods, in the form of a hierarchy, it becoming possible to improve the most problematic aims low down in the hierarchy in the light of improving knowledge, and less problematic aims high up in the hierarchy.³⁴

At first I thought that this aim-oriented empiricist view is in such flagrant contradiction with orthodoxy that no scientist would have upheld it. But then it occurred to me that Einstein in his later years had held a similar view. More important, I discovered that, in creating special and general relativity, he had successfully put into practice the methodology of discovery that becomes available once aim-oriented empiricism is adopted.³⁵ Science implements aim-oriented empiricism in practice, but this is obscured and obstructed by widespread acceptance of standard empiricism.

It then dawned on me that the aim of seeking *explanatory truth* is a special case of the more general aim of seeking *valuable truth* – of value for its own sake, or for practical ends. And this is sought in order that it be *used* by people to enrich their lives. In other words, in addition to metaphysical assumptions inherent in the aims of science there are *value* assumptions, and *political* assumptions, assumptions about how science should be used in life. These are, if anything, even more problematic than metaphysical assumptions. Here, too, assumptions need to be made explicit and critically assessed, as an integral part of science, by scientists and non-scientists alike, in an attempt to improve them.

Released from the crippling constraints of standard empiricism, science would, I felt, burst out into a wonderful new life, realizing its full potential, responding fully both to our sense of wonder and to human suffering, becoming both more rigorous and of greater human value (intellectually and practically).

My Apparent Great Discovery

Then one day, walking back home from work, I stumbled across my (apparent) great discovery.

I had been immensely impressed by the way Popper had generalized his falsificationist conception of scientific method to form a notion of rationality, *critical rationalism*, applicable to all aspects of human life. Falsification becomes the more general idea of *criticism*. Just as scientists make progress by subjecting their theories to sustained attempted empirical falsification, so too all of us, whatever we may be doing, can best hope to achieve progress by subjecting relevant ideas to sustained, severe *criticism*. By subjecting our attempts at solving our problems to criticism, we give ourselves the best hope of discovering (when relevant) that our attempted solutions are inadequate or fail, and we are thus compelled to try to think up something better. By means of judicious use of criticism, in personal, social and political life, we may be able to achieve, in life, progressive success somewhat like the progressive success achieved by science. We can, in this way, in short, learn from scientific progress how to make personal and social progress in life. This, for me, in a nutshell, was Popper's great achievement: to have come up with a revolutionary conception of the progress-achieving methods of science

which he then went on to show had, when generalized, profoundly fruitful implications for a wide range of human endeavours.³⁶

It suddenly occurred to me: I could pursue a path parallel to Popper's. Just as Popper had generalized falsificationism to form critical rationalism, so I could generalize my aim-oriented empiricist conception of scientific method to form an aim-oriented conception of rationality, potentially fruitfully applicable to all that we do, to all spheres of human life. But the great difference would be this. I would be starting out from a conception of science – of scientific method – that enormously improves on Popper's notion. In generalizing this, to form a general idea of progress-achieving rationality, I would be creating an idea of immense power and fruitfulness.

I knew already that the line of argument developed by Popper, from falsificationism to critical rationalism, was of profound importance for our whole culture and social order, and had far-reaching implications and application for science, art and art criticism, literature, music, academic inquiry quite generally, politics, law, morality, economics, psychoanalytic theory, evolution, education, history – for almost all aspects of human life and culture.³⁷ The analogous line of argument I was developing, from aim-oriented empiricism to aim-oriented rationalism, would have even more fruitful implications and applications for all these fields, starting as it did from a much improved initial conception of the progress-achieving methods of science.

The key point is extremely simple – as I have already indicated. It is not just in science that aims are profoundly problematic. This is true in life as well. We all die. This in itself makes our life aims problematic. Government, industry, agriculture, medicine, the military, diplomacy, business, education, the law: all have problematic aims. Above all, the aim of creating a good world is inherently problematic, for all sorts of more or less obvious reasons. Furthermore, it is not just in science that problematic aims are misconstrued or “repressed”; this happens all too often in life too, both at the level of individuals, and at the institutional or social level as well. There is an urgent need – I began to realize – for science to acknowledge, openly and honestly, its real and highly problematic aims so that it could begin to put aim-oriented empiricism explicitly into practice, and thus explicitly improve its aims and methods as it proceeds. Science needs to do this, thus making explicit and apparent its at present implicit and covert exploitation of aim-oriented empiricism, so that we can all see clearly *what* this aim-improving meta-methodology is, and just how extraordinarily successful it is, as far as science itself is concerned. Science thus becomes a methodological paradigm, a methodological resource, for the rest of life. The task then becomes to feed aim-oriented rationalism, generalized from the methods of science, into personal, institutional and social life, so that we may improve our aims and methods as we live – so essential if we are to realize what is genuinely of value to us in life.

But this task struck me as profoundly difficult to perform. Despite its immense desirability, its fundamental importance for the future of humanity, it would meet fierce resistance at all levels, personal, institutional, social, global. It occurred to me that the social sciences and humanities would need to take up, as a long-term project, to work out how we might feed aim-oriented rationality into personal, institutional and social life. This would require the social sciences to be pursued as social *methodology*, or social *philosophy*, fundamentally concerned to help us improve aims and methods in life rather than acquire knowledge about social phenomena. I discovered that Popper, in arguing

from scientific method to rationality and the open society, had been anticipated by the *philosophes* of the French Enlightenment, and I read Peter Gay's great book *The Enlightenment: An Interpretation*, enthralled. But even though the *philosophes* had had their hearts in the right place, they had blundered, I realized, in thinking the task was to develop social *science* alongside natural science. If the basic Enlightenment idea is to learn from scientific progress how to achieve social progress towards an enlightened world, and the task of social inquiry is to work out how to do this, then social inquiry needs to be developed as social methodology, helping us to get into social life progress achieving methods generalized from those that have been exploited with such success in science.

It began to dawn on me that academia as a whole, in thrall to the idea that first, knowledge must be acquired so that, then, subsequently, it can be applied to help solve social problems, is irrational in a far more elementary, wholesale and damaging way than I had realized. Inspired again by Popper, it seemed to me obvious that absolutely elementary rules of rational problem solving are that one (1) articulates, and seeks to improve the articulating of, the problem to be solved, and then (2) proposes and critically assesses possible solutions. If we take seriously the idea that the basic task of academia is to help us realize what is of value to us in life by educational and intellectual means then, at the most fundamental level, the task must be (1) to articulate problems of living, and (2) propose and critically assess possible solutions – possible actions, policies, political programmes, institutional innovations, philosophies of life. What enables us to achieve what is of value is what we *do*, or refrain from doing, not what we know. Even when new knowledge is required, as it is in medicine or agriculture for example, it is always what this enables us to do, that enables us to achieve what is of value (except when knowledge is itself of value).

If it is to devote reason to the best interests of humanity, then academia, I began to realize, would need to be quite fundamentally reorganized. Social inquiry and the humanities would need to be at the heart of academia, promoting cooperatively rational resolving of conflicts and problems of living in the real world (as well as helping us improve aims and methods in life). This fundamental intellectual activity would influence aims and priorities of research in the natural and technological sciences, and would itself, of course, be influenced by the results of such research.³⁸

But what really matters, I realized, is the thinking we engage in as we live, guiding our actions. A basic task for academia is to help us improve this vital, socially active thinking.

I was aware that I had rediscovered my great explosive idea of the summer of 1961: philosophy should be about life; the riddle of the universe is the riddle of our desires. But my initial idea had been radically transformed. It was no longer just philosophy which should be concerned with our problems of living, but the whole academic enterprise. "The riddle of our desires" had become "the profoundly problematic character of our fundamental aims in life, both personal and institutional, including even the aims of science". Or it had become, perhaps: the riddle of the desirable – the riddle of what is ultimately of value in existence. The outcome of generalizing aim-oriented empiricism to form a general conception of rationality, aim-oriented rationality, and then applying this to the task of creating a better world, was an entirely new conception, not just of science, but of academic inquiry, with implications for all of life.

Every branch and aspect of academic inquiry needs to change, I realized, if it is to be what it is supposed to be: rationally organized and devoted to helping humanity achieve what is of value in life.

I was confronted by five revolutions. First, a revolution in the philosophy of science, from standard to aim-oriented empiricism. Second, a revolution in science itself, so that it comes to put aim-oriented empiricism explicitly into scientific practice. Third, a revolution in social inquiry and the humanities, so that they come to give intellectual priority to problems of living, themselves put aim-oriented rationality into practice and take, as a basic, long-term task, to help humanity feed aim-oriented rationality into the social world. Fourth, a revolution in academia as a whole, so that it takes up its proper task of helping humanity realize what is of value in life. And fifth, and finally, the revolution that really matters: transforming the human world so that it puts cooperative problem-solving rationality and aim-oriented rationality into practice in life, so that we may all realize what is of value as we live in so far as this is possible.

At some point it occurred to me that all this had a devastating implication for my own personal life: I would have to take up my own portion of personal responsibility for the state of the planet. For each one of us, it is extraordinarily difficult to feel that the future of the world has anything to do with what we do personally, in our own life. I am just one among billions. Anything I do can only have a minuscule impact on the state of the planet. But this is of course true of all those other billions of people as well. Each one of us is in the position of being powerless before the juggernaut of history, and yet that juggernaut is composed of us, of our actions. We are all responsible, and yet, individually, have only the minutest of impact on the whole. It is only when a majority of us do begin to take some personal responsibility, in our billions of individual, personal lives, for our common future, that we human beings can hope to begin to shape our destiny together, to suit our own best interests, instead of suffering the consequences of billions of us living without concern for what the net impact of our billions of lives may be. We all need, it seemed to me, to put something like 5 % of our life effort into a concern for the state of the planet – the wealthy and powerful, of course, able to do rather more than the poor and powerless. And all this applied directly to me. I could not escape. My philosophy was no longer merely an idea and an argument. It is for life. In particular: my life.

I wrote a book, *The Aims of Science*, in which I spelled out my discoveries. It was rejected by publisher after publisher. I became a bit demented, holding forth to friends and strangers alike on the need to transform our schools and universities. Then a friend told me of a friend of his prepared to publish a book by me expounding my ideas. I thought about it, and then wrote my first book, *What's Wrong With Science?*, in three weeks to meet the publisher's deadline. Most of it takes the form of a fierce debate about the issues between a scientist and a philosopher. No one convinces anyone of anything (although I hoped the reader would find the philosopher's arguments utterly compelling). I thought this book would release my idea into the world, but the publisher failed to understand that review copies had to be sent out, the book received only three reviews, and was in general ignored.

Then Basil Blackwell's agreed to publish a new book. Slowly and painfully, I struggled to put clearly into words the new universe of ideas, arguments and values that I felt I had stumbled across. My argument was that the basic aim of academic inquiry

should be, not just to acquire knowledge, but rather to enhance our capacity to realize what is of value in life. But what is this “capacity”? Very much as an afterthought, it occurred to me that as good a word as any is “wisdom” (even though this had, for me, all sorts of undesirable connotations). Thus was born the title of my second book: *From Knowledge to Wisdom*. This was published in 1984. It received critical reviews from philosophers, some of whom criticized me for defending doctrines I explicitly *rejected* in the book! It received a supportive review from Mary Midgley³⁹ however, and a glowing review in *Nature* by Christopher Longuet-Higgins, who wrote:

“Maxwell is advocating nothing less than a revolution (based on reason, not on religious or Marxist doctrine) in our intellectual goals and methods of inquiry . . . There are altogether too many symptoms of malaise in our science-based society for Nicholas Maxwell's diagnosis to be ignored.”⁴⁰

Unfortunately, my diagnosis has been ignored, and that has something to do with the troubles we face today. We strive to achieve economic growth, more industry and agriculture, more wealth, longer lives, more development, housing and roads, more travel, more cars and aeroplanes, more energy production and use, greater security by means of greater military might. These things seem inherently desirable and many are, in many ways, highly desirable. But our successes in achieving these ends also bring about global warming, war, vast inequalities across the globe, destruction of habitats and rapid extinction of species, depletion of finite natural resources such as oil, pollution of earth, sea and air – even the credit crunch of 2008 and global recession. All our current global problems are the almost inevitable outcome of our long-term failure to put aim-oriented rationality into practice in life, so that we actively seek to discover problems associated with long-term aims inherent in our current endeavours, actively explore ways in which problematic aims can be modified in less problematic directions, and at the same time develop the social, the political, economic and industrial *muscle* able to change what we do, how we live, so that our aims become less problematic, less destructive in both the short and long term. We have failed even to appreciate the fundamental need to improve aims and methods as the decades go by. We have failed to see this even in the case of science. Our very ideals of rationality are such that they fail to help improve aims. Conventional ideas about rationality are all about *means*, not about *ends*, and are not designed to help us *improve* our ends as we proceed. Implementing aim-oriented rationality is essential if we are to survive in the long term, but academia does nothing to promote this idea, and has failed, so far, even to entertain the idea.

Einstein put his finger on what is wrong when he said "Perfection of means and confusion of goals seems, to my opinion, to characterize our age."⁴¹ This outcome is inevitable if we restrict rationality to *means*, and fail to demand that rationality – the authentic article – must quite essentially include the sustained critical scrutiny of *ends*.

After the publication of *From Knowledge to Wisdom*, I turned for a time to grappling with the problems of quantum theory – partly, perhaps, in order to preserve my sanity. But then, in 1994, after early retirement from University College London (because of horrible things going on in my Department) I turned again to the first crucial part of my argument concerning science, and wrote *The Comprehensibility of the Universe*. In this book I was able to solve a problem that had haunted me for two decades (a problem that defeated Einstein): What does it

mean to assert of a theory that it is *unified*?⁴² The book was published by Oxford University Press in 1998, received excellent reviews, but made no discernible impact on Philosophy of Science.

Since then, I have continued to develop and expound the “from knowledge to wisdom” argument in books, papers and lectures. In 2003 I founded *Friends of Wisdom*, an international group of academics and educationalists, at the time of writing some 280 members strong, devoted to promoting wisdom in the university.⁴³ My own university now speaks of “the wisdom agenda” and “Developing a culture of wisdom at UCL” on its website⁴⁴ – the latter the title of a policy document which can be downloaded.⁴⁵ There are many other signs that universities have recently begun to put some elements of wisdom-inquiry into academic practice.⁴⁶

Our long-term failure to put wisdom-inquiry into practice is, as I see it, a monumental and very damaging *philosophical* blunder. For it is a blunder about what ought to be the aims and methods of inquiry, of learning. For too long we have unthinkingly taken for granted that inquiry ought to be, in the first instance, devoted to the pursuit of knowledge whereas, actually, it ought to have been devoted to helping us learn how to realize what is of value in life. Acquiring knowledge is important, but what humanity primarily needs to learn is how to live. Academic philosophers ought to be shouting from the rooftops about this profound philosophical blunder which, as we have seen, now threatens the future of humanity. At present, they are not. I urge my fellow philosophers to do what philosophy ought to do: devote reason to the task of helping to create a wiser world.

This, then, is my conclusion. Research in universities has been devoted, primarily, to acquiring knowledge and technological know-how. But these increase our power to act which, without wisdom, can lead to as much harm as benefit. Current global crises, and especially the most serious, global warming, have arisen in this way. We urgently need to bring about a revolution in our universities so that they come to seek and promote wisdom – wisdom being understood to be the capacity to realize what is of value in life, thus including knowledge, understanding and technological know-how, but much else besides. Universities need to take up the task of helping humanity learn how to make progress towards as good a world as possible. There are signs that this revolution may already be underway. If so, it is happening with agonizing slowness, in a dreadfully muddled and piecemeal way. The underlying intellectual reasons for academic change need to be much more widely appreciated, to help give direction, coherence and a rationale to this nascent academic revolution, and to help ensure that the intellectual value and integrity of science, scholarship and education are strengthened and not subverted.

Notes

¹ *What's Wrong With Science?*, Bran's Head Books, Hayes, 1976; *From Knowledge to Wisdom*, Blackwell, Oxford, 1984; 2nd ed., Pentire Press, London, 2007; *The Comprehensibility of the Universe: A New Conception of Science*, Oxford University Press, Oxford, 1998, pbk., 2003; *The Human World in the Physical Universe: Consciousness, Free Will and Evolution*, Rowman and Littlefield, Lanham, 2001; *Is Science Neurotic?*, Imperial College Press, London, 2004; *Cutting God in Half – And Putting the Pieces Together Again*, Pentire Press, London, 2010.

² See, for example, ‘Science, Reason, Knowledge and Wisdom: A Critique of Specialism’, *Inquiry* 23, 1980, pp. 19-81; ‘What Kind of Inquiry Can Best Help Us Create a Good World?’, *Science, Technology and Human Values* 17, 1992, pp. 205-227; ‘What the Task of Creating Civilization has to Learn from the Success of Modern Science: Towards a New Enlightenment’, *Reflections on Higher Education* 4, 1992, pp. 139-157; ‘Can Humanity Learn to Become Civilized? The Crisis of Science without Civilization’, *Journal of Applied Philosophy* 17, 2000, pp. 29-44; ‘A new conception of science’, *Physics World* 13, no. 8, 2000, pp. 17-18; ‘From Knowledge to Wisdom: The Need for an Academic Revolution’, *London Review of Education*, 5, 2007, pp. 97–115, reprinted in R. Barnett and N. Maxwell, eds., *Wisdom in the University* (Routledge, 2008, pp. 1–19) ‘Do We Need a Scientific Revolution?’, *Journal of Biological Physics and Chemistry*, vol. 8, no. 3, September 2008, pp. 95-105. All my articles are available online at <http://philpapers.org/profile/17092>.

³ It is not so much the neglect of my work that is the scandal, as the neglect by philosophers of the fundamental problem: *What kind of inquiry can best help us create a good world?* (to quote the title of one of my papers: see *Science, Technology and Human Values* 17, 1992, pp. 205-27). That my work highlights the fundamental significance of this problem – still ignored by academic philosophers today – is almost grounds in itself to think this work merits some attention. But academic philosophers ought, at least, to take *the problem* seriously! That they do not is the real scandal.

⁴ But see note 5.

⁵ Note that the outrageous claim with which I began – my claim to have discovered “the key to wisdom” – has become, step by step, very much more modest, even if still a claim concerning a matter of very great importance. I now claim only to have discovered how to correct mistakes made by Enlightenment *philosophes* when they developed their magnificent idea that we need to learn from scientific progress how to achieve social progress towards a wise, enlightened world. Why then did I make the outrageously immodest claim at the beginning of this paper? It is a desperate attempt to catch the reader’s attention. The present article represents one more attempt of mine to alert philosophers to the damaging philosophical blunder inherent in the intellectual/institutional structure of academia as it exists at present, the vital need, for the future of humanity, to bring about an academic revolution so that the basic task becomes to devote reason to helping humanity make progress towards a wise world.

⁶ *From Knowledge to Wisdom*, 1st ed., p. 66; 2nd ed., p. 79.

⁷ For a more detailed account of this conception of the unity of theory, see my *The Comprehensibility of the Universe*, ch. 4; *Is Science Neurotic?*, Appendix, Section 2; *From Knowledge to Wisdom*, 2nd ed., Ch. 14, section 2.

⁸ For further details see my *The Comprehensibility of the Universe*, 1998; *Is Science Neurotic?*, 2004; and *From Knowledge to Wisdom*, especially chs. 5, 9, and 2nd ed., ch. 14; ‘Popper, Kuhn, Lakatos and Aim-Oriented Empiricism’, *Philosophia* 32, nos. 1-4, 2005, pp. 181-239.

⁹ C. P. Snow, *The Two Cultures and a Second Look*, Cambridge University Press, Cambridge, 1964.

¹⁰ See my *From Knowledge to Wisdom*, 2nd ed., ch. 12; ‘Are Universities Undergoing an Intellectual Revolution?’, *Oxford Magazine*, No. 290, Eighth Week, Trinity Term, June 2009, pp. 13-16

¹¹ See his *Confessions of a Philosopher*, Weidenfeld and Nicolson, London, 1997, chapter 1: Scenes from Childhood. The impulse to write up my childhood ‘discoveries’ owes nothing to Magee’s account; it was written long before publication of Magee’s book, sometime before 1987.

¹² I have suggested, elsewhere, how education can be reformed so that it stimulates and builds on childish curiosity, and does not crush it out of existence: see my ‘Philosophy Seminars for Five Year Olds’, *Learning for Democracy*, vol. 1, no. 2, 2005, pp. 71-77 (reprinted in *Gifted Education International*, Vol. 22, No. 2/3, 2007, pp.122-7). Also relevant is my ‘Science, Reason, Knowledge and Wisdom: A Critique of Specialism’, *Inquiry* 23, 1980, pp. 19-81.

¹³ That my work has been influenced by Freud is obvious from the title alone of one of my books: *Is Science Neurotic?*. I have argued, however, that Freud needs to be re-interpreted radically, so that he becomes a *methodologist*. (Psychoanalytic theory itself suffers from rationalistic neurosis.) This reinterpretation transforms the quarrel between Freud and science, highlighted by Popper, Grünbaum, and others. “...it is not Freud who fails to match up to the exacting standards of science; on the contrary, it is *science* that fails to match up to the exacting intellectual standards of Freudianism reinterpreted methodologically. Science suffers from rationalistic neurosis, and needs methodological treatment”: *Is Science Neurotic?*, p. 111. See also *From Knowledge to Wisdom*, 1984, pp. 110-117; 2nd ed., 2007, pp. 122-129.

¹⁴ A few years later I read Karl Popper’s *The Open Society and Its Enemies*, and was pleased to discover I was not alone in holding Plato to have had dictatorial aspirations. Bertrand Russell in his *History of Western Philosophy*, comes to a similar judgement, as does Richard Crossman in his *Plato Today*.

¹⁵ Behaviourism emerges merely as a result of the factual assumptions Ryle makes in discussing the “use” (and so meaning) of mental concepts. Different factual assumptions would lead to different results. Consider a society which believes some members are philosophical zombies, devoid of consciousness, while others are conscious because they possess Cartesian minds. The use of “conscious” in such a society would reveal that, in order to be conscious, one must possess a Cartesian mind. This just indicates how dishonest and spurious Ryle’s whole procedure is.

¹⁶ “What is the nature of reality?” is an authentic problem because we are confronted by a number of rival views about the nature of the world, and we want to know which is true – for example, naïve realism, physicalism, phenomenalism and, the one I favour, experiential physicalism.

¹⁷ K. R. Popper, *Conjectures and Refutations*, Routledge and Kegan Paul, London, 1963, p. 5.

¹⁸ Some years later, I added an important item to the argument. In opposition to the claim that physics cannot predict experiential features, it could be argued that physics could be extended so that it does predict these features. All that needs to be done is to add to physics extra postulates correlating physical features with experiential ones. Such an extended physics would however, I subsequently argued, be hopelessly non-explanatory. Each extra postulate would be horrendously complex, and there would also be a vast number of them, to include the vast number of different kinds of possible experiential

features and inner experiences that there are. Physical theory extended in this fashion would become hopelessly complex, *ad hoc* and non-explanatory. The simplicity and unity – and thus the explanatory character – of physical theory would be wholly sabotaged. As I put it decades later “There is, in short, an *explanation* as to why physics does not, and cannot, include the mental, the experiential. If it did, the extraordinary explanatory power of physical theory would vanish. Excluding the experiential is the price we pay for having the marvellously explanatory theories that we do have in physics”: see “Three Philosophical Problems about Consciousness and their Possible Resolution”, 2003, <http://philsci-archive.pitt.edu/archive/00002238/>; *Open Journal of Philosophy*, 2011, vol. 1, issue 1, pp. 1-10.

¹⁹ *What’s Wrong With Science?*, 1976, pp. 139-146; *From Knowledge to Wisdom*, 1984, ch. 10; ‘Are There Objective Values?’, *The Dalhousie Review* 79, no. 3, 1999, pp. 301-317; *The Human World in the Physical Universe*, 2001, ch. 2; *Cutting God in Half – And Putting the Pieces Together Again*, 2010, ch. 4.

²⁰ ‘Physics and Common Sense’, *British Journal for the Philosophy of Science* 16, 1966, pp. 295-311; ‘Can there be Necessary Connections between Successive Events?’, *British Journal for the Philosophy of Science* 19, 1968, pp. 1-25; ‘Understanding Sensations’, *Australasian Journal of Philosophy* 46, 1968, pp. 127-46.

²¹ T. Nagel, *Philosophical Review* 83, 1974, pp. 435-50; F. Jackson, *Journal of Philosophy* 3, 1986, pp. 291-95.

²² See especially ‘Physics and Common Sense’, pp. 303-8; and ‘Understanding Sensations’, pp. 127 and 134-7.

²³ F. Dretske, ‘Laws of Nature’, *Philosophy of Science* 44, 1977, pp. 248-68; M. Tooley, ‘The Nature of Law’, *Canadian Journal of Philosophy*, 7, 1977, pp. 667-698; and D. Armstrong, *A Theory of Universals*, Cambridge University Press, Cambridge, 1978; and *What is a Law of Nature?*, Cambridge University Press, Cambridge, 1983.

²⁴ See my *From Knowledge to Wisdom*, 1984, ch. 8, replies to objections 6 and 7, and chs. 9 and 10; ‘The Mind-Body Problem and Explanatory Dualism’, *Philosophy* 75, 2000, pp. 49-71; *The Human World in the Physical Universe*, 2001; ‘How Can Life of Value Best Flourish in the Real World?’, in *Science and the Pursuit of Wisdom: Studies in the Philosophy of Nicholas Maxwell*, ed., L. McHenry, Ontos Verlag, 2009, pp. 1-56; *Cutting God in Half – And Putting the Pieces Together Again*, 2010; ‘Three Philosophical Problems about Consciousness and their Possible Resolution’, *Open Journal of Philosophy*, 1, issue 1, 2011, pp. 1-10; ‘Reply to Comments on *Science and the Pursuit of Wisdom*’, *Philosophia*, 38, Issue 4, 2010, pp. 677-684. See also note 20.

²⁵ B. van Fraassen, 1989, *Laws and Symmetry*, Clarendon Press, Oxford, 1989.

²⁶ For references to my subsequent work on this problem see note 24.

²⁷ See ‘A New Look at the Quantum Mechanical Problem of Measurement’, *American Journal of Physics* 40, 1972, pp. 1431-5; ‘Alpha Particle Emission and the Orthodox Interpretation of Quantum Mechanics’, *Physics Letters* 43A, 1973, pp. 29-30; ‘The Problem of Measurement - Real or Imaginary?’, *American Journal of Physics* 41, 1973, pp. 1022-5; ‘Towards a Micro Realistic Version of Quantum Mechanics’, *Foundations of Physics* 6, 1976, pp. 275-92 and 661-76; ‘Instead of Particles and Fields’, *Foundations of Physics* 12, 1982, 607-31; ‘Quantum Propensiton Theory: A Testable Resolution of the Wave/Particle Dilemma’, *British Journal for the Philosophy of Science* 39, 1988, pp.1-

50; 'Beyond Fapp: Three Approaches to Improving Orthodox Quantum Theory and An Experimental Test', in *Bell's Theorem and the Foundations of Modern Physics*, edited by A. van der Merwe, F. Selleri and G. Tarozzi, World Scientific, 1993, pp. 362-70; 'Particle Creation as the Quantum Condition for Probabilistic Events to Occur', *Physics Letters A* 187, 1994; pp. 351-5; 'A Philosopher Struggles to Understand Quantum Theory: Particle Creation and Wavepacket Reduction', in *Fundamental Problems in Quantum Physics*, edited by M. Ferrero and A. van der Merwe, Kluwer Academic, London, 1995, pp. 205-14; 'Does Probabilism Solve the Great Quantum Mystery?', *Theoria* vol. 19/3, no. 51, 2004, pp. 321-336; 'Is the Quantum World Composed of Propensitons?', in *Probabilities, Causes and Propensities in Physics*, edited by M. Suárez, Springer, Dordrecht, 2011, pp. 219-241.

²⁸ 'Clash of Ideas', review of I. Lakatos and A. Musgrave, eds., *Criticism and the Growth of Knowledge*, Cambridge University Press, Cambridge, 1970, in *Nature* 231, 1971, p. 269.

²⁹ See my 'A Critique of Popper's Views on Scientific Method', *Philosophy of Science* 39, 1972, pp. 131-52.

³⁰ See note 7 and associated text.

³¹ We can also add to T* corroborated empirical laws which T cannot (yet) predict because the equations of T cannot be solved.

³² K. Popper, *Conjectures and Refutations*, 1963, p. 241.

³³ See note 8 and preceding text.

³⁴ My criticisms of Popper and standard empiricism, and my arguments for aim-oriented empiricism are to be found in 'A Critique of Popper's Views on Scientific Method', *Philosophy of Science* 39, 1972, pp. 131-52; 'The Rationality of Scientific Discovery', *Philosophy of Science* 41, 1974, pp. 123-53 and 247-95; 'Induction and Scientific Realism' *British Journal for the Philosophy of Science* 44, 1993, pp. 61-79, 81-101 and 275-305; 'The Need for a Revolution in the Philosophy of Science', *Journal for General Philosophy of Science* 33, 2002, pp. 381-408; 'A Priori Conjectural Knowledge in Physics', in *What Place for the A Priori?*, edited by Michael Shaffer and Michael Veber, Open Court, Chicago, 2011, pp. 211-240; and works referred to in note 8. Aim-oriented empiricism has the great advantage over standard empiricism in providing solutions to fundamental problems in the philosophy of science – problems of induction, simplicity (or unity), verisimilitude, and the character of scientific method: see note 8, and 'Practical Certainty and Cosmological Conjectures', in *Gibt es sicheres Wissen?*, ed. Michael Rahnfeld, Leipziger Universitätsverlag, 2006. pp. 44-59.

³⁵ See my 'Induction and Scientific Realism: Einstein, Aim-Oriented Empiricism and the Discovery of Special and General Relativity', *British Journal for the Philosophy of Science* 44, 1993, pp. 275-305.

³⁶ This is the line of argument that takes one from Popper's *The Logic of Scientific Discovery* to his *The Open Society and Its Enemies* and *Conjectures and Refutations*. It has not, I think, received the attention that it deserves, partly, perhaps, because it tends to be stated in footnotes and asides, partly because it straddles too wide a stretch of disciplines for today's specialists to be able to take it on board. It is, however, in my view, Popper's great achievement.

³⁷ For some of these implications and applications see Popper's *Unended Quest*, 1976, Fontana, London.

³⁸ For a list of changes that need to be made if knowledge-inquiry is to become wisdom-inquiry, see my *Is Science Neurotic?*, pp. 118-121. See also www.nick-maxwell.demon.co.uk/What.htm (accessed 9 December 2011).

³⁹ She wrote "a strong effort is needed if one is to stand back and clearly state the objections to the whole enormous tangle of misconceptions which surround the notion of science to-day. Maxwell has made that effort in this powerful, profound and important book" M. Midgley, "Is Wisdom Forgotten?", *University Quarterly: Culture, Education and Society* 40, 1986, pp. 425-7.

⁴⁰ C. Longuet-Higgins, "For goodness sake", *Nature* 312, 15 Nov., 1984, p.204.

⁴¹ A. Einstein, *Ideas and Opinions*, 1973, Souvenir Press, London, p. 337.

⁴² See ch. 4. I also argued that aim-oriented empiricism solves the problems of induction and verisimilitude.

⁴³ See www.knowledgetowisdom.org/ (accessed 21st November 2011).

⁴⁴ See www.ucl.ac.uk/research/wisdom-agenda (accessed 21st November 2011).

⁴⁵ www.ucl.ac.uk/research/wisdom-agenda/2011-UCL_Wisdom-Agenda.pdf

⁴⁶ See note 10.