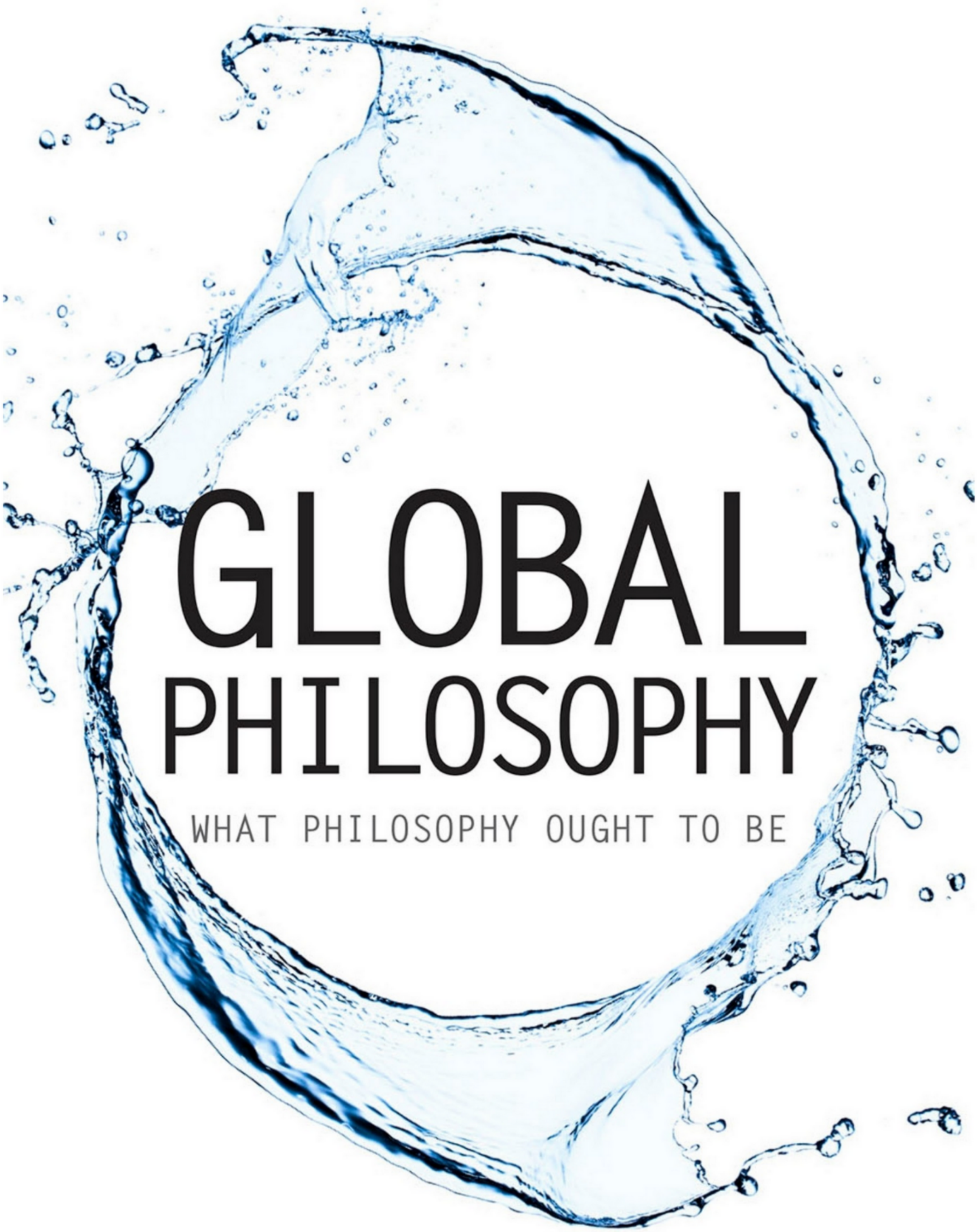

GLOBAL PHILOSOPHY

WHAT PHILOSOPHY OUGHT TO BE

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Preface: Learning, Global Problems, and Play

These essays are about education, learning, rational inquiry, philosophy, science studies, problem solving, academic inquiry, global problems, wisdom and, above all, the urgent need for an academic revolution.

Despite this range and diversity of topics, there is a common underlying theme. Education ought to be devoted, much more than it is, to the exploration of real-life, open problems; it ought not to be restricted to learning up solutions to already solved problems—especially if nothing is said about the problems that provoked the solutions in the first place. There should be much more emphasis on learning how to engage in cooperatively rational exploration of problems: even five-year-olds could begin to learn how to do this. A central task of philosophy ought to be to keep alive awareness of our unsolved fundamental problems—especially our most fundamental problem of all, encompassing all others: How can our human world—and the world of sentient life more generally—imbued with the experiential, consciousness, free will, meaning, and value, exist and best flourish embedded as it is in the physical universe? This is both our fundamental intellectual problem and our fundamental problem of living.

As far as the latter is concerned, we are at present heading towards disaster—as our immense, unsolved global problems tell us: population growth, destruction of natural habitats and rapid extinction of species, vast inequalities of wealth and power around the world, pollution of earth, sea, and air, our proclivity for war, and above all global warming. If we are to resolve our conflicts and global problems more intelligently, effectively, and humanely than we have managed to do so far, then we have to learn how to do it. That, in turn, requires that our institutions of learning, our universities and schools, are rationally designed and devoted to the task. At present they are not. That is the crisis behind all the others. From the past we have inherited the idea that the basic intellectual aim of inquiry ought to be to acquire knowledge. First, knowledge is to be acquired; then, secondarily, it can be applied to help solve social problems. But this is dangerously and damagingly irrational,

and it is this irrationality that is, in part, responsible for the genesis of our current global problems, and our current incapacity to solve them. As a matter of supreme urgency, we need to transform academia so that it becomes rationally devoted to helping humanity learn how to make progress towards as good and wise a world as possible. This would involve putting problems of living—including global problems—at the heart of academia, problems of knowledge and technological know-how emerging out of, and feeding back into, the central task to help people tackle problems of living in increasingly cooperatively rational ways. Almost every department and aspect of academia needs to change. We need a new kind of academic inquiry devoted not just to knowledge but rather to wisdom—wisdom being the capacity to realize what is of value in life for oneself and others, wisdom including knowledge and technological know-how, but much else besides.

So, this is what these essays seek to provoke: a concerted effort to transform our institutions of learning so that they become rationally and effectively devoted to helping us learn how to create a wiser world.

With these essays before me, I can see that there is one crucial element of learning about which they say nothing—or nothing explicit. The vital role of play in learning. All mammals—or at any rate almost all mammals—learn by means of play. Cats, tigers, foxes, and other predators learn to hunt by means of endless mock fights when kittens and cubs. Deer, sheep, and antelope learn to escape by means of playful leaps and bounds when young. We are mammals too. Almost certainly, we learnt how to be adult human beings by means of play during the millions of years we evolved into *homo sapiens* living in hunting and gathering tribes. Children today, out of school, learn by means of play. Learning by means of play is almost certainly fundamental to our make-up. Education needs to exploit it. Schools and universities need to become places of play. Successful problem solving is often likely to be playful in character. The youthful Einstein called doing physics “getting up to mischief”.

But our most serious problems of living are so grim, so imbued with suffering, wasted lives, and unnecessary death, that the idea of approaching them in a playful spirit seems sacrilegious. We need to keep alive tackling of intellectual problems so that playful capacities can be exercised—if for no other reason (and other reasons there are, of course,

aplenty). There are two really worthy impulses behind all rational inquiry: delight and compassion.

Chapter One: Philosophy Seminars for Five-Year-Olds

For Harry

All of us, I believe, are extraordinarily active and creative intellectually when we are very young. 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 pale 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 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 has only 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 so rarely helps us to recognize and to develop our early profound intellectual experiences and achievements. Instead of encouraging our instinctive curiosity to develop into adulthood, all too often education unintentionally stifles and crushes it out of existence.

Academic inquiry *ought* to be the outcome of all our efforts to discover what is of value in existence and to share our discoveries with others. At its most important and fundamental, inquiry is the thinking we engage in as we live, as we strive to realize what is of value to us in our life. All of us ought both to contribute to and to learn from interpersonal

public inquiry. This two-way traffic of teaching and learning ought to start at the outset, when we first attend school. Young children, at school, need to be encouraged to tell each other about their discoveries, their experiences, their thoughts and problems. The teacher needs to encourage both speaking and listening. Such a class or seminar, devoted to the cooperative, imaginative, and rational exploration of problems encountered in life, ought to form a standard—even a central and fundamental—part of all education, science, and scholarship, from primary school to university.

If this were the case, then we might all discover how to use science and scholarship so as to develop our own thinking—and living. Telling others of our problems and ideas—and listening to others tell of theirs—would help us to discover and to value our own thinking. It is all too easy to dismiss our most serious and original thinking—those moments of bafflement, surmise, and wonder—as mere wordless feeling, irredeemably private, signifying little. This is especially the case in childhood. Unarticulated, our thinking is liable to become neglected, stagnant, forgotten. If it is to flourish it is vital that we develop and constantly practise the difficult art of putting what we feel and think into public words. An education that gave an intellectually fundamental role to the development of this art would not only stimulate the growth of personal thinking, it would also enable us to discover vital interconnections between our personal thinking and public scientific and scholarly thought. Academic education would be not an imposition but an invitation to participate from the outset.

I do not want to exaggerate. Education of this person-centred, participatory kind already exists, to some extent, in both the arts and the sciences. Teachers of literature, drama, and the other arts appreciate that art serves, as it were, a double purpose. As we enhance our understanding and appreciation of literature, so too, incidentally, we may enhance our understanding of ourselves and of others. By exploring, in novels and plays, imaginary people living imaginary lives, we can achieve a freedom to explore aspects of ourselves without the embarrassment or torture of public self-exposure. Furthermore, in order to improve our understanding of literature it is important that we try our hand at writing, which can enhance our powers of self-expression and our self-understanding. Analogous remarks can be made about drama,

art, music, dance. And again, in science education at its best, it is appreciated that it is not just scientific results that need to be taught, but also, and perhaps most fundamentally, scientific *problems*. It has long been appreciated that in order to *understand* science it is essential to *do* it.

What is missing in all this is an appreciation of the central and unifying role of *philosophy* in all of education—philosophy pursued as the cooperative, imaginative, and rational exploration of fundamental problems of living. Philosophy pursued in this way would effortlessly bridge the gulf between science and art, science and the humanities. All other parts of the curriculum—the physical and biological sciences, mathematics, geography, history, politics, literature, theatre, religion, etc. —could quite naturally and understandably emerge out of, and feed back into, the central, unifying enterprise of philosophy pursued as the open, rational exploration of fundamental problems. The very problem of how to unify all the diverse aspects of the world into a coherent, understandable whole could itself be recognized and discussed. The world we live in is a more or less interconnected whole: it is not experienced as being split up into physics, chemistry, biology, history, literature, religion, and so on. Setting out to improve children's knowledge and understanding of the world in specialized, dissociated fragments, without any indication as to how the fragments fit together or, worse, without even an indication of the existence of the problem, is in itself an appallingly anti-rational and alienating thing to do. It amounts to the imposition of a sort of intellectual schizophrenia. It sets up a barrier between *personal* thinking and departmentalized *academic* thought, resulting in mutual distrust rather than mutual enhancement between these two kinds of thought. In important respects, academic learning cannot promote—it can only sabotage—coherent, rational thought about problems of living in this one, real, interconnected world.

Failure to teach philosophy to five-year-olds, as a central, unifying part of the curriculum, is the result of mistaken assumptions about both children and philosophy.

Philosophy, it is assumed, is too difficult and esoteric a subject to be taught to five-year-olds. Only adults can come to grips with such an advanced discipline. In fact it is, if anything, the other way round. Above all, it is young children who are compelled, by their situation, to be

highly active and creative philosophers, daily concerned with fundamental problems about the nature of life and the world. Most adults have long ago settled in their minds, in one way or another, fundamental questions about the nature of life and the world. It is particular, detailed, and specialized problems that preoccupy adult minds. The mere fact that most adult teachers neither recognize nor feel any discomfort concerning the profound philosophical disorder of the curriculum they daily administer to children is itself a blatant indication of the unphilosophical character of the adult mind. Philosophy, one might say, is instinctively and naturally a concern of childhood, and only rather rarely and artificially still a matter of concern in adult life.

This in turn, of course, makes it difficult for adults to teach philosophy properly. The main mistake would be to teach philosophy as another academic subject, as a body of recognized problems, proposed solutions, and debates. The pupil would be expected to learn this up. This would, of course, miss the point entirely.[1] For what is needed is, in a sense, not the *teaching* of anything at all, but rather the encouraging of children themselves to engage in the activity of articulating and scrutinizing problems and their possible solutions. Furthermore, it would be vital to do this in an honest and open-ended way, there being no prohibitions on what problems can be discussed, what solutions considered. The nature of the universe, war, sex, death, power, money, politics, fame, pop stars, parents, school, work, marriage, the meaning of life, evolution, God, failure, drugs, love, suffering, happiness: whatever it is that the children find fascinating or disturbing, and want to discuss, deserves to be discussed. Where there are no known or no agreed answers, the teacher must acknowledge this. The teacher must readily acknowledge his or her own ignorance or uncertainties. The main task of the teacher will be to try to ensure that the children speak one at a time, that everyone gets to speak, and that those who are not speaking, listen. The teacher will also, of course, try to establish a spirit of generosity towards the ideas of others, while at the same time encouraging criticism and argument. The main object of the seminar is to enable children to discover for themselves the value of cooperative, imaginative, rational problem solving by taking part in it themselves. Only good, experienced teachers could hope to make a success of the philosophy seminar run along these lines.

The purpose of the seminar is not to promote mere *debate*. Argument is to be used as an aid to exploration and discovery: it is not to be used merely to trounce opponents or to win converts—as an excuse, that is, for intellectual duelling or bullying. The seminar must not be conducted in such a way that it amounts to overt or disguised *indoctrination* in some creed—however correct or noble the creed may be judged to be. Insofar as a creed is implicit in the seminar, it might be put like this: it is proper and desirable for people to resolve problems and conflicts in cooperative, imaginative, and rational ways. This creed is itself open to discussion and critical assessment—along with all other political, religious, moral, economic, social, and philosophical doctrines. The problem of how to distinguish cooperative discussion from indoctrination deserves itself to be discussed when it arises. Again, the seminar is not *group therapy*. Its primary aim is not to solve the participants' urgent practical, personal problems (although it may occasionally and incidentally help to do this). Problems can be imagined and do not need to be lived. Ideas can be aired as possibilities, and do not need to be believed. Accounts of personal experience are welcomed when relevant to the discussion, but are not expected or demanded. The aim of the seminar is to explore possibilities, and not to reach decision about actions. Unanimity does not need to be sought.

It is nothing less than an educational scandal that seminars of this type are not a standard part of school and university life, available to everyone from the age of five years upwards. However, it is not just that there has been a general failure to organize all education around such a philosophy seminar. Worse still, there has been, and still is, a general failure even to see the vital need to do this. The very idea of the philosophy seminar for five-year-olds, as indicated here, has generally not been entertained. A major reason for this is that the proper purpose and character of philosophy, and of academic inquiry more generally, has long been, and still is, radically misunderstood, especially by academics themselves.

Academic inquiry is widely taken to have as its proper, basic intellectual task the improvement of expert, specialized knowledge and technological know-how. As long as academic inquiry is pursued and organized with this basic task in mind, the philosophy seminar, as depicted above, can scarcely form a normal, let alone a central, part of university work. Non-expert, non-specialized discussion of our problems

of living—however imaginative, rational, cooperative, and potentially fruitful—cannot contribute to the acquisition of expert, specialized knowledge. Groups devoted to such discussion may amount to worthy debating societies, group therapy sessions, or Quaker prayer meetings: they cannot constitute standard *academic seminars*.

The fault here lies with the orthodox conception of academic inquiry. It is an intellectual and human disaster. When judged from the standpoint of improving specialized knowledge, orthodox academic inquiry must, it is true, be judged to be, on the whole, both rational and extraordinarily successful. But when judged from the more important and fundamental standpoint of improving human welfare, enhancing the quality of human life, academic inquiry must be judged to be grossly irrational and unsuccessful. In order substantially to improve the quality of human life on earth we need, amongst other things, to get rid of war, the threat of war, armaments whether nuclear, biological, chemical, or conventional, the extreme poverty of the third world, tyranny, exploitation and enslavement. Humanity needs to discover how to resolve its local and global conflicts and problems of living in more cooperatively rational ways. But cooperative *action* requires cooperative *discussion*. If academic inquiry is to devote itself, rationally and successfully, to promoting human welfare, then it must give priority to providing such cooperative discussion; it must, as a matter of absolute intellectual priority, (a) articulate our problems of living, and (b) propose and critically assess alternative possible solutions, possible cooperative *actions*. Problems of *knowledge* must be tackled in a subordinate way, scientific and technological research emerging out of and feeding back into the more fundamental concern with problems of *living*.

Contemporary academic inquiry, in giving priority to problems of knowledge over problems of living, fails to do what it most needs to do: create and promote a tradition of thinking devoted to resolving human conflicts and problems in cooperatively rational ways. In the absence of a general capacity to act cooperatively, the mere provision of knowledge and technological know-how can do as much harm as good, as the twentieth-century record of science and war, and the nuclear arms race, so horrifyingly exemplifies.

We urgently need, in brief, a new, more intellectually rigorous and humanly desirable kind of academic inquiry, one that gives priority to

helping us realize what is of value in life, individually, locally, and globally. This new kind of inquiry gives intellectual priority to personal and social (or global) problems of living (rather than problems of knowledge) and endeavours to help us discover how to act, to live, in progressively more cooperatively rational ways, so that we achieve what is genuinely of value to us in the circumstances of our lives. The basic aim is to promote personal and social wisdom in life—wisdom being defined as the capacity to realize what is of value, for ourselves and others. Wisdom, so defined, includes, but goes beyond, knowledge and technological know-how. Given the existence of such a tradition of inquiry in the world, there is a real chance that humanity might learn how to make steady and substantial progress towards a generally happier state of affairs than that which we endure at present.

Once the academic community wakes up to the desperately urgent need to transform the academic enterprise in this way, so that its basic task becomes to promote not only *knowledge* but also personal and social *wisdom* in life, it will at once become blindingly obvious that the philosophy seminar, more or less as described above, does indeed need to be put at the heart of all inquiry and education, from primary school to university. Unfortunately, the academic community, despite being devoted to reason and innovation, is in many ways extremely conservative and highly resistant to change, especially when it comes to changing the overall aims and methods of inquiry. I am especially aware of this, having argued for some thirty years for the urgent need to change academic inquiry from knowledge to wisdom: so far I have seen few signs of change (see Maxwell, 1976a; 1980; 1984; 2000a; 2004a). If we wait for the scientists, scholars, and university administrators to wake up to what needs to be done, we may have to wait for ever. What we can do, and need to do, is begin with the five-year-olds. Professors may be past it, but five-year-olds are not.

The above was written long ago, in 1986, in complete ignorance of the philosophy for children movement. I then discovered Gareth Matthews' delightful little book *Philosophy for the Young Child* (1980), and as a result I laid aside this plea for philosophy for five-years-olds on the assumption that the matter was already satisfactorily in hand. Since then, philosophy for children has become a world-wide movement, and it

might seem that this essay is redundant. This is not the case, for at least two reasons.

First, the philosophy for children movement seems to take for granted a thoroughly orthodox, analytic conception of philosophy, according to which philosophy is one discipline alongside others, concerned with puzzle solving and conceptual analysis. Given this conception of philosophy, it is difficult to see why philosophy should occupy a central and fundamental role in the curriculum. What is lacking is an awareness of the need to bring about a revolution in the aims and methods of academic inquiry as a whole, including philosophy and education, so that the basic aim becomes to acquire and promote wisdom, problems of living being put at the heart of the academic enterprise. Once one becomes aware of the need to bring about this revolution, it becomes clear that the philosophy seminar, along the lines I have indicated, ought to be central to all of education. The philosophy for children movement would, in my view, become more credible and cogent were it to join forces with the effort to transform inquiry as whole so that it takes up its proper task of promoting wisdom by rational means. Only within a genuinely rational kind of inquiry devoted to promoting wisdom can the philosophy seminar, as I have described it, come to have its proper place and role.

Second, in England the national curriculum all but prohibits the philosophy seminar as I have depicted it. Group discussion, listening and speaking, and problem solving are, it is true, all encouraged, and citizenship and personal, social, and health education are included. Furthermore, the curriculum for primary education may well be sufficiently flexible to permit something like the philosophy seminar to take place in individual schools. But there is, in the national curriculum, no hint that group discussion might feed into other parts of the curriculum, into science, history, or English. And when it comes to secondary education, the curriculum seems to be so rigidly constructed that it seems impossible that the philosophy seminar could get elbow room, let alone influence the rest of the curriculum.

We need to bring about a revolution in the national curriculum here in England, and we need a world-wide revolution in education and academia, so that the philosophy seminar comes to play a central role, for five- to ninety-five year-olds.

1 This mistake is evident in current A-level philosophy syllabuses.

Chapter Two: What Philosophy Ought to Be

Introduction

The proper task of philosophy is to keep alive awareness of what our most fundamental, important, urgent problems are, what our best attempts are at solving them and, if possible, what needs to be done to improve these attempts. Unfortunately, academic philosophy fails disastrously even to conceive of the task in these terms. It makes no attempt to ensure that universities tackle global problems—global intellectually, and global in the sense of concerning the future of the Earth and humanity. Universities do not give sustained attention to global problems (due to specialization and giving priority to the pursuit of knowledge) and as a result violate three of the four most elementary rules of rational problem solving conceivable. Judged from the standpoint of helping humanity tackle global problems, universities as at present constituted betray reason and, as a result, betray humanity. Bereft of institutions of learning rationally designed to help us make progress towards as good and wise a world as possible, not surprisingly we fail to learn how to do it. This is the key crisis of our times. And it is, at root, a failure of *philosophy*. It is the failure of philosophy to keep alive rational exploration of global problems in universities, and in the public domain —a failure that can be traced back to the origins of modern philosophy in the 17th century. We urgently need a revolution in philosophy so that academic philosophers take up their proper task of promoting rational exploration of our fundamental, global problems.

1. What Philosophy Ought to Do

Philosophy is unique. There is no other academic discipline that has laboured for so long under such a massive misconception as to what its basic task ought to be.

The proper basic task of philosophy is to keep alive awareness of what

our most fundamental, important, urgent problems are, what our best attempts are at solving them, and what the relative merits and demerits of these attempts are. A basic task is to articulate, and improve the articulation of, our fundamental problems, and make clear that there are answers to these problems implicit in much of what we do and think—implicit in science, politics, economic activity, art, the law, education, and so on—these answers often being inadequate and having adverse consequences for life and thought in various ways as a result.

Philosophy should also try to help *improve* our attempted solutions to our fundamental problems, by imaginatively proposing and critically assessing possible solutions, all the time making clear, where relevant, that different possible solutions have different implications for diverse aspects of life. As a result of improving our attempted solutions to our fundamental problems we may thereby contribute to the improvement of our lives, and help us make progress towards a good world.[1]

Even though these are the proper, fundamental tasks for philosophy, it hardly needs to be said that none of these tasks can be said to be the exclusive domain of philosophy or academic philosophers. Quite the contrary, a central task of philosophy is to stimulate as many people as possible to think about fundamental problems imaginatively and critically—that is, *rationally*. Philosophy is not to be characterized or delineated from other disciplines in terms of *who does it*, but rather in terms of *the fundamental character of the problems being tackled*, and perhaps *the value of the contribution in question*.[2]

What, then, are our fundamental problems? Our most fundamental problem of all, encompassing all others, can be put quite simply like this:

How can our human world, and the world of sentient life more generally, imbued with the experiential, consciousness, free will, meaning, and value, exist and best flourish embedded as it is in the physical universe?[3]

Some will reject the idea that the ultimate reality behind the natural world is physical in character. For example, there are those who hold that the ultimate reality is God. In order not to exclude such views in an *a priori* fashion, as it were, we need a broader formulation of the above problem:

How can our human world… exist and best flourish embedded as it is in

the real world?

I interpret the first formulation of this problem in such a way that it encompasses all of academic thought, from theoretical physics, mathematics, and cosmology, via the biological and technological sciences, to social inquiry and the humanities. It also encompasses all practical problems of living—problems facing individuals, groups, institutions, societies, nations, and humanity as a whole.[4]

The key idea of this conception of philosophy is that philosophy is concerned to help solve rationally our most *fundamental* problems. But what exactly does "fundamental" mean here?

We can perhaps say that problem P_1 is more fundamental than P_2 if solving P_1 also, at least in principle,[5] solves P_2, but not *vice versa*. This suffers from the disadvantage that "P_1 is more fundamental than P_2" in this sense might just mean that P_1 is more general. Can we distinguish "more fundamental" from "more general"—the former being stronger? It can be done like this. P_1 is more fundamental than P_2 if the solution to P_1 solves P_2, but not *vice versa*, and the solution to P_1 is unified or coherent in some significant, substantial sense of these terms, and not just a jumble of disconnected items. An example of a unified or coherent solution is a unified physical theory that solves a range of problems in physics.[6]

Granted this conception of the basic task of philosophy, it at once becomes clear that philosophy in the university has, as an elementary obligation, to ensure that sustained thinking about our fundamental problems and how to solve them goes on in an influential way within academic inquiry. This is, indeed, a basic requirement for academic inquiry to be rational. Four elementary, almost banal, rules of reason are:

(1) Articulate, and seek to improve the articulation of, the basic problem to be solved.

(2) Propose and critically assess possible solutions.

(3) If the basic problem to be solved proves intractable, specialize. Break the basic problem up into subordinate problems. Tackle analogous, easier-to-solve problems, in an attempt to work gradually to the solution to the basic problem to be solved.

(4) But if one engages in specialized problem solving in this way, make sure that specialized and basic problem solving interact, so that

each influences the other (since otherwise specialized problem solving is likely to become unrelated to the basic problems we seek to solve).

Sustained thinking about what we may call "global" problems—global intellectually, and global in the sense of encompassing the earth and humanity as a whole—must go on in universities in a way that influences, and is influenced by, more specialized research if rules (1), (2), and (4) are to be put into practice, and academic inquiry is to meet elementary requirements for rationality. Philosophy as sustained thinking about our fundamental problems and how to solve them must be an integral, influential part of academia if academia as a whole is to be rational. A quite basic task for philosophy, then, is to ensure, as a bare minimum, that universities are organized in such a way that each university has a big, prestigious Seminar or Symposium, open to all at the university from undergraduate to vice-chancellor, which meets regularly to explore global problems in a sustained way, and in a way that is capable of influencing, and being influenced by, more specialized research.

From what I have said so far, one would expect such global seminars to be commonplace in universities around the world.

I know of no university anywhere that has such a global seminar.[7]

Academic philosophy has failed dismally to create such a global seminar in the university. Even worse, it has made no attempt to do so. Worse still, academic philosophy has failed almost entirely to take on the task I have indicated above—the task of keeping alive awareness of what our most fundamental problems are (as a bare minimum).

Academic philosophy today does not even recognize, as a fundamental problem of the discipline: *What kind of inquiry can best help us realize what is of value in life?* or, to quote the title of an article of mine, *What kind of inquiry can best help us create a good world?* (Maxwell, 1992).

2. A Fundamental Failure of Philosophy

Academic philosophy does discuss some technical, conceptual puzzles associated with the fundamental problem I have indicated above. There is discussion of puzzles associated with the mind/body problem, free will and determinism, the question of whether physical theory can be interpreted "realistically" as postulating unobservable physical entities

such as electrons and quarks, and discussion of some related conceptual issues having to do with such things as knowledge, perception, reason, action, the good, justice, what is of value. But the basic tasks for philosophy that I have indicated above are just not done.[8]

The consequences of this abysmal failure of academic philosophy to do what it most needs to do are dire indeed. The outcome is that academia as a whole fails both reason and humanity. The failure of academic inquiry to give an important role to the sustained exploration of global problems within the university means that academia violates three of the four most elementary rules of reason that one can think of—rules (1), (2), and (4). Rule (3) is of course put splendidly into effect in all our universities. Disciplines splintering again and again and again into ever more specialized subordinate disciplines is one of the most striking features of the university today.[9] But the failure to tackle fundamental problems in a sustained and influential way means that rules (1) and (2) are violated, which in turn means that rule (4) is violated as well.[10]

This wholesale, structural breakdown of rationality is no mere formal matter. It has dire consequences for humanity. This long-standing structural irrationality of academia is in part responsible for the genesis of our current global problems, and our incapacity to resolve them effectively and wisely. People die as a result.

Consider some of the most serious global problems that face humanity today: rapid growth in the world's population, the lethal character of modern war and terrorism, immense differences in wealth and power around the globe, destruction of natural habitats and rapid extinction of species, pollution of earth, sea, and air—and, grimmest of all, perhaps, the impending disasters of climate change.

What would resolve these problems in such a way that the outcome is a more peaceful, just, equable, democratic, sustainable world—a world in which we all have good chances of leading lives of value? Certainly relevant scientific knowledge, understanding, and technological know-how are essential. But these problems would be resolved fundamentally not by knowledge or technological know-how but by appropriate *actions*. It is what we do, or refrain from doing, not what we know that enables us to realize what is of value in life (except when knowledge is of value in itself). Even when scientific knowledge and technological know-how are relevant, as they are in medicine or agriculture for example, it is always

what this knowledge enables us to *do* that leads to the achievement of what is of value, not the knowledge in itself.

Thus, in order to solve our global problems we need to discover how to *do* what needs to be done to resolve them. We need, fundamentally, to discover how so to act, to live, that we tackle our global problems in increasingly effective, intelligent, and humane ways.

We need to *learn* how to do it. We need to *learn* how to develop and implement new political programmes, new policies, new economic strategies, new ways of living. We need to improve our institutions, our trading relations, our laws and customs, our politics, our media, the content of our communications. Above all, I would suggest, we need to learn how to tackle our global problems in increasingly cooperatively rational ways.

We are confronted, then, by an immense task of learning, and that, in turn, means that it is vitally important that our *institutions of learning*—our universities and schools—are properly organized, structured, and devoted to helping us learn what we need to learn. Our universities need to be organized and devoted, fundamentally, to helping us learn how so to act, to live, that we progressively resolve our conflicts and problems of living, including our global problems, in such ways that, with increasing success, we come to realize what is genuinely of value in life.

In short, granted that the basic aim of academia is to help promote human welfare, help people realize what is of value in life, the problems that need to be tackled are, fundamentally, problems of living, problems of action in the real world and not, primarily, problems of knowledge. A basic academic task must be to promote cooperatively rational tackling of problems of living in the great social world beyond the confines of the university. Universities cannot of course decide for the rest of us what our problems of living are and what we need to do about them. Their job is to propose, to argue, to critically assess, to promote awareness of what our problems may be, and what may be our options. And to learn from, and spread awareness of, good solutions in practice wherever they are to be found in the community. One might think of universities as a kind of people's civil service doing openly for the public what actual civil services are supposed to do, in secret, for governments. Universities need just sufficient power to retain their independence from government, industry, the media, the military, public opinion, but no more.

A kind of academic inquiry well-designed to help promote human welfare, in short, must, as a matter of absolute intellectual priority (1) articulate problems of living (including global problems), and (2) propose and critically assess possible solutions—possible actions, policies, political programmes, economic strategies, ways of life. It must also, of course, (3) engage in specialized scientific and technological problem solving, but must, at the same time, (4) ensure that fundamental and specialized problem solving influence each other, so that fundamental problem solving is informed of the results of specialized research, and specialized research retains its relevance to our fundamental problems of living.

If universities were designed in this way around the world, there might be some hope that we would gradually learn how to resolve our grave global conflicts and problems in increasingly cooperatively rational ways, thus gradually making progress towards a better, wiser world. But universities are not remotely designed or organized in this vitally necessary way. From the past we have inherited the idea that academia must devote itself, in the first instance at least, to the pursuit of knowledge. First, knowledge is to be acquired; then, in a secondary way, it can be applied to help solve social problems. The vitally necessary task of tackling problems of living imaginatively and critically is excluded from the intellectual domain of inquiry, or pushed to the periphery and marginalized. What universities most need to do to help humanity learn how to make progress towards as good a world as possible is not done at all, or is only done in a severely restricted fashion, and certainly not as the central, primary concern.

This is a failure of philosophy. It is the failure of philosophy to establish that universities need to give sustained attention to fundamental problems in order to meet elementary requirements of rationality, and in order to serve the best interests of humanity. It is the failure of philosophy even to conceive of the need to do this.

The outcome of this failure is that, instead of helping to solve global problems, universities have, if anything, actually helped to create and intensify these problems.

It is all too rarely appreciated that modern scientific knowledge and technological know-how have made all our current global problems possible. Much of great benefit has of course come from science and

technology. They have made the modern world possible. But in making possible modern industry and agriculture, modern medicine and hygiene, modern transport and armaments, they also made possible all the global problems indicated above: the explosive growth in the world's population, vast inequalities in wealth and power around the world, the lethal character of modern war, climate change, and the rest.

There is a sense, indeed, in which science and technology may be said to be the *cause* of these things. It will be said at once that it is not *science* that is the cause of these global problems but rather the things that we *do*, made possible by science and technology. This is obviously correct. But it is also correct to say that scientific and technological progress *is* the cause. The meaning of "cause" is ambiguous. By "the cause" of event E we may mean something like "the most obvious observable events preceding E that figure in the common sense explanation for the occurrence of E". In this sense, human actions (made possible by science) are the cause of such things as people being killed in war, destruction of tropical rain forests. On the other hand, by the "cause" of E we may mean "that prior change in the environment of E which led to the occurrence of E, and without which E would not have occurred". If we put the 20th century into the context of human history, then it is entirely correct to say that, in this sense, scientific-and-technological progress is the cause of our distinctive current global disasters: what has changed, what is new, is scientific knowledge, not human nature. Give a group of chimpanzees rifles and teach them how to use them and in one sense, of course, the cause of the subsequent demise of the group would be the actions of the chimpanzees. But in another obvious sense, the cause would be the sudden availability and use of rifles—the new, lethal technology. Yet again, from the standpoint of theoretical physics, "the cause" of E might be interpreted to mean something like "the physical state of affairs prior to E, throughout a sufficiently large spatial region surrounding the place where E occurs". In this third sense, the sun continuing to shine is as much a part of the cause of war and pollution as human action or human science and technology.

In short, if by the cause of an event we mean that prior change which led to that event occurring, then it is the advent of modern science and technology that has caused all our current global crises. It is not that people became greedier or more wicked in the 19th and 20th centuries; nor

is it that the new economic system of capitalism is responsible, as some historians and economists would have us believe. The crucial factor is the creation and immense success of modern science and technology.

Many blame science for our problems. But that misses the point. It is not science that is at fault, but rather science *dissociated from a more fundamental concern with our problems of living and what to do about them*. The fault lies with our failure to develop a kind of inquiry, sketched above, rationally designed and devoted to helping us learn how to solve our problems of living, realize what is of value to us in life. The fault lies not with science but with philosophy.[11]

3. How Philosophy Came to Fail so Drastically

How and why did philosophy come to fail so drastically? Once upon a time, it is clear, philosophy had no inhibitions at all about tackling fundamental problems. What kind of universe is this? How did we come to be? What is of most value in life? What kind of social world should we strive to create? The ancient Greek philosophers tackled these fundamental problems in stark, bold terms: this is the case, for example, of Thales, Anaximander, Heraclitus, Democritus, Socrates, Plato, Aristotle. Early modern philosophers did this too: Descartes, Leibniz, Locke, Hobbes, Spinoza, Kant. We need to remember, indeed, that modern science began as an extraordinarily successful outgrowth of philosophy. The creators of modern science, Kepler, Galileo, Hooke, Boyle, Huygens, Newton, and their contemporaries all thought of themselves as engaged in philosophy—in natural or experimental philosophy. And the basic task of natural philosophy was to improve our answers to the fundamental philosophical problem: What kind of universe is this? Kepler, Galileo, Descartes, Boyle, Huygens, Leibniz, and other natural philosophers of the time did not hesitate to put forward their conjectures about the nature of the universe along with proposed laws and theories about more specific phenomena such as terrestrial and astronomical motion, sunspots, the tides, light, gases, and so on.

What happened? What caused philosophy to abandon tackling fundamental problems?

It all goes back to the triumph of Newtonian physics and, in particular, associated with this, the triumph of Newton’s conception of scientific

method.

In his *Principia*, Newton claimed to derive his law of gravitation from the phenomena by induction without framing hypotheses. He claims to do this as follows. First, from his three basic laws of motion, Newton proves mathematically a great number of theorems which concern, amongst other matters, bodies that move along elliptical and parabolic paths, and bodies that move under the influence of a force directed towards a fixed centre. He proves, for example, that a body in motion under the influence of a force directed towards a fixed centre that varies inversely as the square of the distance will travel along an elliptical path. Newton then formulates four "rules of reasoning in philosophy". These specify, in somewhat different ways, how universal laws may be arrived at by induction from observed regularities, without resort to metaphysical or philosophical hypotheses. Newton then formulates six phenomena, six astronomical regularities. These concern the manner in which the moons of Jupiter, Saturn, and Earth in their motions around their respective planets, and the motions of the six inner planets in their motions around the sun, observe Kepler's laws of planetary motion. From these phenomena, Newton then goes on to derive by induction his universal law of gravitation, invoking during the course of this inductive derivation his mathematical theorems, and his four rules of reasoning.[12]

For some years after the publication of Newton's *Principia* in 1686, natural philosophers fell into two camps. On the one hand those in England supported Newton, while those on the Continent, by and large, supported Descartes. As Voltaire put it decades later in his *Lettres Philosophiques*:

> A Frenchman arriving in London finds things very different, in natural science as in everything else. He has left the world full, he finds it empty. In Paris they see the universe as composed of vortices of subtle matter, in London they see nothing of the kind… For your Cartesians everything is moved by an impulsion you don't really understand, for Mr. Newton it is by gravitation, the cause of which is hardly better known.[13]

The astonishing predictive and explanatory success of Newtonian theory, together no doubt with his claim to have derived his universal law of gravitation from the phenomena by induction without appealing to

metaphysical hypotheses, led eventually to the downfall of Cartesian physics and cosmology, and the triumph of Newton. And along with the victory of Newtonian physics came the victory of Newtonian methodology. Descartes' somewhat rationalistic, *a priori* methods of "clear and distinct ideas" fell into disfavour. Instead, after the immense success of Newtonian physics, natural philosophers had, it seemed, for the first time in history, a clear way forward. What one had to do in order to acquire reliable knowledge of nature was to put Newton's rules of reasoning into practice. First, discover regularities in the natural world by means of observation and experiment. Then, apply Newton's rules of induction to arrive at universal laws and theories. Philosophical and metaphysical speculation no longer had any role whatsoever in natural philosophy—or in "natural science" as it came subsequently to be called. Scientists could ignore philosophy, and exploit Newton's extraordinarily successful empirical methods. Thus gradually after Newton, natural philosophy was reborn as science.[14]

A gulf opened up between science and philosophy. Scientists came to feel that they could safely ignore philosophy, as irrelevant to the task of improving scientific knowledge of the natural world by means of the established methods of natural science bequeathed to them by Newton. And philosophy for its part participated in the creation of this gulf by failing to produce anything of interest or of use to the new science. This failure stemmed from a more basic failure to solve fundamental problems thrown up by the new natural philosophy, and the new science. As a result, philosophy became more and more remote from science. The natural philosophy of Galileo, Kepler, Descartes, and even Newton, broke up into natural science on the one hand, philosophy on the other.[15] So vast and decisive is this gulf that, in a wholly anachronistic way, it is today projected back into the past, so that nowadays we divide up 16th- and 17th-century natural philosophers, quite artificially, into two camps: the scientists (Kepler, Galileo, Huygens, Newton), and the philosophers (Descartes, Locke, Leibniz, Hobbes, Spinoza). They would not have seen themselves in this fashion. They would have held themselves to have been natural philosophers without exception.

Philosophy failed to solve two absolutely fundamental problems created by the new natural science, namely:

1. How is it possible for science to establish universal laws and

theories by means of inductive inference from evidence?

2. If the universe really is more or less as modern science seems to tell us it is, how can our human world exist, imbued as it seems to be with colours, sounds, smells, tactile qualities as we experience them, and with consciousness, free will, meaning, and value? If the universe is, in the end, more or less as depicted by physics, does not that mean that the world as we experience it is almost entirely an illusion?

It is the failure of modern philosophy to solve these two fundamental problems that accounts for its progressive alienation from its basic task: to keep alive awareness of our fundamental problems. I take these two problems in turn in the next two sections.

4. The Problem of Induction

Problem 1 arises because, however much evidence there is in support of a physical theory, Newtonian theory let us say, or quantum theory—however severely tested the theory may be—endlessly many rival theories can be concocted which fit all the available evidence just as well as the given theory. We can concoct endlessly many such rivals by modifying the given theory in wholly ad hoc ways so that each new theory differs from the initial theory only for some as yet unobserved phenomenon—for example, some phenomenon that lies in the future.[16] The problem was formulated in a particularly striking way by David Hume.[17] It led Immanuel Kant to ask "How is science possible?"[18] Ever since, philosophers have struggled to answer Kant's question, and have failed.[19] Nothing could highlight more dramatically the difference between science and philosophy. Whereas science goes from strength to strength, philosophy goes backwards. It is reduced to trying to work out how any theoretical knowledge in science can be achieved at all. Far from contributing to the success of science, for philosophy it is this very success that poses the problem. Philosophy has, it seems, nothing fruitful or helpful to contribute to science at all. And this tends to be the opinion of scientists themselves. Some years ago John Ziman, a physicist, wrote, "the Philosophy of Science… [is] arid and repulsive. To read the latest symposium volume on this topic is to be reminded of the Talmud, or of the theological disputes of Byzantium".[20] More recently Steven Weinberg declared: "From time to time… I have tried to read current

work on the philosophy of science. Some of it I found to be written in a jargon so impenetrable that I can only think that it is aimed at impressing those who confound obscurity with profundity… [O]nly rarely did it seem to me to have anything to do with the work of science as I knew it… I am not alone in this; I know of *no one* who has participated actively in the advance of physics in the post-war period whose research has been significantly helped by the work of philosophers."[21] Recently, Stephen Hawking pronounced that "philosophy is dead".[22] Given the apparent impotence of philosophy to be of any help to science, these comments are hardly surprising.

As it happens, the problem of induction has been solved, and a philosophy of science has been put forward that would, if put into scientific practice, be genuinely fruitful for science.[23] By and large, this solution has been overlooked by both philosophers and scientists.[24]

In order to solve the problem of induction, we need first to follow Karl Popper, and acknowledge scientific theories cannot be verified empirically; they can only be falsified.[25] We then need to appreciate that theories in physics have to satisfy *two* requirements to be accepted. They must be sufficiently empirically successful; and they must be sufficiently *unified* (that is, they must postulate near enough *the same* laws for the range of phenomena to which the theory applies).[26] We then need to appreciate that persistent acceptance of (more or less) *unified* theories even though endlessly many empirically more successful disunified rivals can easily be concocted means that physics makes a big metaphysical assumption about the universe: there is some kind of underlying dynamic unity in nature.[27] Then it needs to be appreciated that this assumption, because of its substantial, influential, and highly problematic character, needs to be represented in the form of a hierarchy of assumptions (and associated methods), assumptions becoming less and less substantial, and more nearly such that they must be true for science, or the pursuit of knowledge, to be possible at all. At each level in the hierarchy, that assumption is adopted which best accords with the assumption above, and leads to the most empirically progressive research programme, or offers the best promise of leading to such a programme. Assumptions are subjected to sustained criticism, alternatives being developed and assessed, in an attempt to improve the assumptions that are adopted, criticism being concentrated where it is likely to be most

fruitful, near the bottom of the hierarchy. This *aim-oriented empiricist* conception of physics (as I have called it) enables us to improve assumptions and methods—aims and methods—as scientific knowledge and understanding improve. There is something like positive feedback between improving scientific knowledge, and improving assumptions and methods, improving knowledge about how to improve knowledge—the nub of scientific rationality, according to this view.[28]

Not only does aim-oriented empiricism solve the problem of induction. Putting it explicitly into practice would have fruitful implications for science.[29] The centuries-long scientific poverty of philosophy comes to an end. In making explicit implicit metaphysical assumptions of physics, and in providing a framework of relatively unproblematic, fixed assumptions (high up in the hierarchy), aim-oriented empiricism provides a framework for the *improvement* of more substantial and problematic metaphysical assumptions, lower down in the hierarchy.[30] Aim-oriented empiricism provides physics with a rational, if fallible and non-mechanical, method for the discovery of revolutionary new theories.[31] And aim-oriented empiricism clarifies what it means to say of a physical theory that it is *unified*, and provides a partial ordering of theories with respect to degrees of unity.[32] Furthermore, aim-oriented empiricism has implications throughout natural science, and not just for theoretical physics.[33]

Aim-oriented empiricism transforms science, philosophy, and the relationship between the two.[34] Philosophy of science, insofar as it is about what are, and ought to be, the aims and methods of science, becomes an integral part of science itself, within the framework of aim-oriented empiricism.[35] And science, in a sense, ceases to be science and becomes much more like natural philosophy as it was in the time of Newton. Metaphysics, methodology, epistemology, philosophy all become a vital, integral part of science itself, as in Newton's time. The great divide between science and philosophy, inherited from Newton, is no more—or would be no more, if aim-oriented empiricism were to be adopted.[36]

But as long as the untenable, orthodox view is taken for granted that evidence alone determines what is accepted in science, philosophy will continue to be largely irrelevant to science. The chances are that philosophers of science will continue to ask despairingly the Kantian

question “How is scientific knowledge possible?”, and will not contribute to attempts to solve the fundamental problems tackled by science, and created by our scientific knowledge and understanding.

One day, perhaps, scientists may come to look favourably on aim-oriented empiricism. Even philosophers may eventually take note of the view. Then natural philosophy might be recreated, and academic philosophy might again begin to take up its proper tasks.

5. The Human World/Physical Universe Problem

Associated with the birth of what we now call modern science (but was then called natural philosophy), there was a revolution in philosophy. Aristotelianism was rejected, and atomism was adopted instead. But atomism creates a profound problem concerning the existence and value of the human world. If the universe really is made up solely of atoms that interact in accordance with precise laws, and are bereft of all experiential qualities such as colours, sounds, and smells, how can the world exist as we experience it, full of colours, sounds, and smells? How can our inner experiences exist, our thoughts and feelings, our states of consciousness? How can we be responsible for our actions—how can we have free will? How can human life have any meaning or value?

Atomism as adopted by Galileo (1564–1642), Descartes (1596–1650), or Huygens (1629–1695) is very different from the view of the universe adopted by physicists today. But the dramatic changes in our conception of the physical universe that have come about since the 17th century have not in themselves had much impact on the problem just indicated—*the human world/physical universe problem* (HW/PhU problem) as it may be called. What is common to our view of the universe today and the atomism of the 17th century, a doctrine that may be called *physicalism*, can be put like this: the universe is made up solely of one kind of physical entity (perhaps one entity), that interacts in accordance with precise (perhaps probabilistic) physical law. (Aim-oriented empiricism tells us that the basic physical entity, some kind of physical field pervading all of space and time, interacts with itself in accordance with a unified pattern of physical law.) It is physicalism that poses the human world/physical universe problem.

This problem posed by science, posed by the metaphysical view of the

universe associated with modern science, is a *philosophical* problem—indeed *the* philosophical problem *par excellence*, as I proposed at the beginning of this essay. And it has, in a way, been central to philosophy since Galileo and Descartes. But attempts at solving the problem over the centuries have been disastrous failures. And it is this long-standing failure that has led much of philosophy to become remote from science, to become alienated from its basic problems and tasks, and to become lost in esoteric trivialities. The degeneration of philosophy has been the outcome.

An early and famous attempt at the solution is due to Descartes.[37] Cartesian dualism divides reality into two realms: the physical universe; and the world of minds. Physicalism is correct about the material world. Everything that physics leaves out, the sensory qualities we experience, are to be scooped up from the world around us and tucked into our minds. Minds are associated with, distinct from, but in interaction with, living brains of persons.

Cartesian dualism is a brilliant attempt at the solution to the HW/PhU problem. But it faces lethal problems. There is the problem of the wild implausibility of these mysterious entities, conscious minds, somehow being associated with physical processes going on in our brains, but utterly distinct from them. There is the problem of the *interaction* between brain and mind. Mind must interact with brain if we are to have free will, but such an interaction would mean that physical processes occur in our brains which cannot even in principle be explained physically. Cartesian dualism must postulate persistent, minute, poltergeist events in the brain. Physicalism is violated. But by far the most serious problem confronting Cartesian dualism is that it implies (or seems to imply) that it is impossible for us to acquire any knowledge of the physical world around us. The world we experience, what we see, hear, touch, taste, smell, does not exist. It is all in the mind. How then can we experience any aspect of the physical world? We are locked inside our minds. And physics, applied to the processes of perception, seems to confirm this. Light enters our eyes, which causes physical processes to travel up our optic nerve to our brain, and then we have the experience of seeing, a mental event remote from, and utterly different from, its external cause in the physical world.

Given that Cartesian dualism faces these horrendous problems, the

Chapter Three: How Can Our Human World Exist and Best Flourish Embedded in the Physical Universe?

A Letter to an Applicant to a New Liberal Studies Course

Introduction

In this chapter I sketch a liberal studies course designed to explore our fundamental problem of thought and life: How can our human world exist and best flourish embedded as it is in the physical universe? The fundamental character of this problem provides one with the opportunity to explore a wide range of issues. What does physics tell us about the universe and ourselves? How do we account for everything physics leaves out? How can living brains be conscious? If everything occurs in accordance with physical law, what becomes of free will? How does Darwin's theory of evolution contribute to the solution to the fundamental problem? What is the history of thought about this problem? What is of most value associated with human life? What kind of civilized world should we seek to help create? Why is the fundamental problem not a part of standard education in schools and universities? What are the most serious global problems confronting humanity? Can humanity learn to make progress towards as good a world as possible? These are some of the questions that can be tackled as an integral part of exploring the fundamental problem. But the course does not merely wander at random from one issue to another. Taking the fundamental problem as central provides the course with a coherent structure. The course would be conducted as a seminar, and it would respond to queries and suggestions from students.

Thank you so much for your query concerning our new Liberal Studies

Course. I will do what I can to tell you about the Course. It has been in the planning stage for some time. Now at last it will begin, for the first time ever, in the autumn. Those of us involved in creating the Course are very excited about it. We are full of enthusiasm, and we hope our students will be as well.

Our basic idea is that the whole Course should be organized around the exploration of an open, unsolved, fundamental problem. Instead of providing answers to questions never stated or asked (as is so often the case in education), we will together, students and staff, explore imaginatively and critically, that is *rationally*, a real, unsolved, fundamental problem.

The problem we have chosen can be stated quite simply like this:

Fundamental Problem: How can our human world—and the world of sentient life more generally—imbued with the experiential, consciousness, free will, meaning, and value—exist and best flourish embedded as it is in the physical universe?

We interpret this fundamental problem in such a way that it encompasses all of academic thought, from theoretical physics, mathematics, and cosmology, via the biological and technological sciences, to social inquiry and the humanities. It also encompasses literature, music, and the other arts, politics, law, journalism, industry, agriculture, and finance, and indeed all practical problems of living—problems facing individuals, groups, institutions, societies, nations, and humanity as a whole. It is, in our view, quite simply, our fundamental problem—our fundamental intellectual problem of knowledge and understanding, and our fundamental practical problem of living faced by each one of us personally in life, and faced by all of us together.[1] A part of what the Course will attempt to do is see how this, our fundamental problem, connects up with more specific problems—problems of science, of social inquiry and the humanities, political and economic problems, problems each one of us face individually in life as we live—and problems that face humanity as a whole. We will try to trace out a kind of intellectual architecture of problems—the great nave of the intellectual cathedral breaking up into arches, chapels, diverse crooks and crannies of specialized research. And of course we will explore rival ideas as to what


image
not
available

41 Einstein (1973, p. 337).

42 See Maxwell (1998, ch. 4). I also argued that aim-oriented empiricism solves the problems of induction and verisimilitude.

43 See www.knowledgetowisdom.org (accessed 6 February 2014).

44 See www.ucl.ac.uk/research/wisdom-agenda (accessed 6 February 2014).

45 See note 10.