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A REVOLUTION FOR SCIENCE AND THE HUMANITIES: FROM KNOWLEDGE TO WISDOM

ABSTRACT

At present the basic intellectual aim of academic inquiry is to improve knowledge. Much of the structure, the whole character, of academic inquiry, in universities all over the world, is shaped by the adoption of this as the basic intellectual aim. But, judged from the standpoint of making a contribution to human welfare, academic inquiry of this type is damagingly irrational. Three of four of the most elementary rules of rational problem-solving are violated. A revolution in the aims and methods of academic inquiry is needed so that the basic aim becomes to promote wisdom, conceived of as the capacity to realize what is of value, for oneself and others, thus including knowledge and technological know-how, but much else besides. This urgently needed revolution would affect every branch and aspect of the academic enterprise.

Key words: knowledge; wisdom; the Enlightenment; reason; natural science; social inquiry; philosophy; academic inquiry; intellectual revolution; cooperation.

1. GLOBAL PROBLEMS

The world today is beset with problems. There is the impending problem of global warming. There is the problem of the progressive destruction of tropical rain forests and other natural habitats, with its concomitant devastating extinction of species. Humanity urgently needs to discover how to create a sustainable world industry and agriculture that does not wreak havoc on the environment; attempts do this have, so far, proved ineffective. There is the terrible problem of war, over one hundred million people having been killed in countless wars during the course of the twentieth century (which compares unfavourably with the twelve million or so killed in wars during the nineteenth century). There is the obscenity of the arms trade, the massive stockpiling of armaments, even by poor countries, and the ever present threat of their use by terrorists or in war, whether

the arms be conventional, chemical, biological, or nuclear. There is the sustained, profound injustice of immense discrepancies of wealth across the globe, the industrially advanced first world of North America, Europe, and elsewhere experiencing unprecedented wealth while something like three quarters of humanity live in conditions of abject poverty in the third world, hungry, unemployed, without proper housing, health care, education, or even access to safe water. There is the long-standing problem of the rapid growth of the world's population, pronounced especially in the poorest parts of the world, and adversely affecting efforts at development. And there is the horror of the AIDS epidemic, again far more terrible in the poorest parts of the world, devastating millions of lives, destroying families, and crippling economies.

And, in addition to these stark global crises, there are problems of a more diffuse, intangible character, signs of a general cultural or spiritual malaise. There is the phenomenon of political apathy: the problems of humanity seem so immense, so remorseless, so utterly beyond human control, and each one of us, a mere individual, seems wholly impotent before the juggernaut of history. The new global economy can seem like a monster out of control, we human beings having to adapt our lives to its demands, rather than it being for us. There is the phenomenon of the trivialization of culture, as a result of technological innovation, such as TV and the internet. Once people created and participated in their own live music, theatre, art, and poetry. Now this is pumped into our homes and into our ears by our technology, a mass-produced culture for mass consumption; we have become passive consumers, and the product becomes ever more trivial in content. And finally, there is the phenomenon of the rise of religious and political fanaticism opposed, it can seem, in all-too faint-hearted and self-doubting a way by those who seek to uphold democracy and liberalism, apparently confirming Yeats's lines "The best lack all conviction, while the worst are full of passionate intensity".

2. FROM KNOWLEDGE TO WISDOM

What can be done in response to global problems such as these? There are a multitude of things that can be done, and a multitude that *are* being done, in varying degrees, with varying amounts of success. Here, I wish to concentrate on just *one* thing that could be done, which would go to the heart of the above global problems, and to the heart of our apparent current incapacity to respond adequately to these problems.

We need to bring about a wholesale, structural revolution in the aims and methods, the entire intellectual and institutional character of academic inquiry. At present, academic inquiry is devoted to acquiring *knowledge*. The idea is to acquire knowledge, and then apply it to help solve social problems. This needs to change, so that the basic aim becomes to promote *wisdom*—wisdom being understood to be the capacity to realize what is of value in life for oneself and

others (and thus including knowledge, know-how, and understanding).[1] Instead of devoting itself primarily to solving problems of knowledge, academic inquiry needs to give intellectual priority to the task of discovering possible solutions to problems of living. The social sciences need to become social philosophy, or social methodology, devoted to promoting more cooperatively rational solving of conflicts and problems of living in the world. Social inquiry, so pursued, would be intellectually more fundamental than natural science. The natural sciences need to recognize three domains of discussion: evidence, theories, and aims. Problems concerning research aims need to be discussed by both scientists and non-scientists alike, involving as they do questions concerning social priorities and values. Philosophy needs to become the sustained rational exploration of our most fundamental problems of understanding; it also needs to take up the task of discovering how we may improve our personal, institutional, and global aims and methods in life, so that what is of value in life may be realized more successfully. Education needs to change so that problems of living become more fundamental than problems of knowledge, the basic aim of education being to learn how to acquire wisdom in life. Academic inquiry as a whole needs to become somewhat like a people's civil service, having just sufficient power to retain its independence and integrity, doing for people, openly, what civil services are supposed to do, in secret, for governments. These and many other changes, affecting every branch and aspect of academic inquiry, all result from replacing the aim to acquire knowledge by the aim to promote wisdom by cooperatively rational means.[2]

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[1] A more detailed characterization of wisdom is given below in section 7.

[2.] For a presentation of the case that the basic aim of inquiry needs to change in the way indicated, and for a discussion of the implications that such a change would have, developed in much more detail than is possible in the present essay, see my *From Knowledge to Wisdom* (Oxford: Blackwell, 1984). See also Nicholas Maxwell, *What's Wrong with Science? Towards a People's Rational Science of Delight and Compassion* (Frome: Bran's Head Books, 1976); "Science, Reason, Knowledge, and Wisdom: A Critique of Specialism", *Inquiry*, 23 (1980), pp. 19–81; "From Knowledge to Wisdom: Guiding Choices in Scientific Research", *Bulletin of Science, Technology, and Society*, 4 (1984), pp. 316–334; "From Knowledge to Wisdom: The Need for an Intellectual Revolution", *Science, Technology, and Society Newsletter*, 21 (1985), pp. 55–63; "The Fate of the Enlightenment: Reply to Kekes", *Inquiry*, 29 (1986), pp. 79–82; "Wanted: A New Way of Thinking", *New Scientist*, 14 (May 1987), p. 63; "How Can We Build a Better World?", in *Einheit der Wissenschaften: Internationales Kolloquium der Akademie der Wissenschaften zu Berlin, 25–27 June 1990*, ed. J. Mittelstrass (Berlin: Walter de Gruyter, 1991), pp. 388–427; "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. 47–69; "Can Academic Inquiry Help Humanity Become Civilized?", *Philosophy Today*, 13 (1993), pp. 1–3; "Science and the Environment: A New Enlightenment", *Science and Public Affairs*, (Spring 1997), pp. 50–56; "Can Humanity Learn to Become Civilized? The Crisis of Science without Civilization", *Journal of Applied Philosophy*, 17 (2000), pp. 29–44; "Is Science Neurotic?", *Metaphilosophy*, 33 (2002), pp. 259-299; *The Human World in the Physical Universe* (Lanham, Maryland: Rowman and Littlefield, 2001), especially chapter 9; *Is Science Neurotic?* (London: Imperial College Press, 2004).

3. THE CRISIS OF SCIENCE WITHOUT WISDOM

It may seem surprising that I should suggest that changing the aims and methods of academic inquiry would help us tackle the above global problems. It is, however, of decisive importance to appreciate that *all* the above global problems have arisen because of a massive increase in scientific knowledge and technology without a concomitant increase in global wisdom. Degradation of the environment due to industrialization and modern agriculture, the horrific number of people killed in war, the arms trade and the stockpiling of modern armaments, the immense differences in the wealth of populations across the globe, rapid population growth: all these have come about, have been made possible, by the rapid growth of science and technology since the birth of modern science in the seventeenth century. Modern science and technology are even implicated in the rapid spread of AIDS in the last few decades. It is possible that, in Africa, AIDS has been spread in part by a program of polio vaccinations, or simply by contaminated needles used in inoculation programs; and globally, AIDS has spread so rapidly because of travel made possible by modern technology. And the more intangible global problems indicated above have also come about, in part, as a result of the rapid growth of modern science and technology.

That the rapid growth of scientific knowledge and technological know-how should have these kind of consequences is all but inevitable. Scientific and technological progress massively increases our power to act: in the absence of wisdom, this will have beneficial consequences, but will also have harmful ones, whether intended, as in war, or unforeseen and unintended (initially at least), as in environmental degradation. As long as we lacked modern science, lack of wisdom did not matter too much: our power to wreak havoc on the planet and each other was limited. Now that our power to act has been so massively enhanced by modern science and technology, global wisdom has become, not a luxury, but a necessity.

The crisis of our times, in short—the crisis behind all the others—is the crisis of science without wisdom. Having a kind of academic inquiry that is, by and large, restricted to acquiring knowledge can only serve to *intensify* this crisis.[3] Changing the nature of science, and of academic inquiry more generally, is

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[3] It may be objected that it is not *science* that is the cause of our global problems but rather the things that we *do*, made possible by science and technology. This is obviously correct; it is indeed the point made in the text. 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 commonsense 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 or the 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 that led to the occurrence of E, and without which E would not have occurred". If we put the twentieth 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 distinctively twentieth-century disas-

the key intellectual and institutional change that we need to make in order to come to grips with our global problems—above all, the global problem behind all the others, the crisis of ever-increasing technological power in the absence of wisdom. We urgently need a new kind of academic inquiry that gives intellectual priority to promoting the growth of global wisdom.

4. THE DAMAGING IRRATIONALITY OF KNOWLEDGE-INQUIRY

There are those who simply blame scientific rationality for our problems. Scientific rationality needs to be restrained, it is argued, by intuition and tradition, by morality or religion, by socialism, or by insights acquired from the arts or humanities.[4] But this kind of response profoundly misses the point. What we are suffering from is not too much reason, but not enough. Scientific rationality, so-called, is actually a species of damaging *irrationality* masquerading as rationality. Academic inquiry as it mostly exists at present, devoted to the growth of knowledge and technological know-how—*knowledge-inquiry* I shall call it[5]—is actually profoundly irrational when judged from the standpoint of contributing to human welfare. Judged from this all-important standpoint, knowledge-inquiry violates *three* of the four most elementary, uncontroversial rules of reason that one can conceive of. And that knowledge-inquiry is grossly irrational in this way has everything to do with its tendency to generate the kind of global problems considered above. Instead of false simulacra of reason, what we so urgently need is authentic reason devoted to the growth of wisdom.

What then, it may be asked, do I mean by "reason"? As I use the term here, rationality appeals to the idea that there are general methods, rules, or strategies which, if put into practice, give us our best chance, other things being equal, of solving our problems, realizing our aims. Rationality is an aid to success, but does not guarantee success, and does not determine what needs to be done.

Four elementary rules of rational problem-solving are:

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ters: what has changed, what is new, is scientific knowledge, not human nature. 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.

[4] For literature protesting against the influence of scientific rationality in various contexts and ways, see for example: I. Berlin, *The Roots of Romanticism*. (London: Chatto and Windus, 1999); R. D. Laing, *The Divided Self* (Harmondsworth: Penguin, 1965); H. Marcuse, *One Dimensional Man* (Boston: Beacon Press, 1964); T. Roszak, *Where the Wasteland Ends* (London: Faber and Faber, 1973); M. Berman, *The Reenchantment of the World* (Ithaca: Cornell University Press, 1981); B. Schwartz, *The Battle for Human Nature* (New York: W. W. Norton, 1987); P. Feyerabend, (1978) *Against Method* (London: Verso, 1978); and *Farewell to Reason* (London: Verso, 1987); B. Appleyard, *Understanding the Present: Science and the Soul of Modern Man* (London: Picador, 1992).

[5] For a much more detailed exposition of knowledge-inquiry, see my *From Knowledge to Wisdom*, chapter 2.

(1) Articulate and seek to improve the articulation of the basic problem(s) to be solved.
(2) Propose and critically assess alternative possible solutions.
(3) When necessary, break up the basic problem to be solved into a number of preliminary, simpler, analogous, subordinate, more specialized problems—to be tackled in accordance with rules (1) and (2)—in an attempt to work gradually toward a solution to the basic problem to be solved.
(4) Interconnect attempts to solve the basic problem and specialized problems, so that basic problem-solving may guide, and be guided by, specialized problem-solving.[6]

No enterprise that persistently violates rules (1) to (4) can be judged rational. If academic inquiry is to contribute to the aim of promoting human welfare, the quality of human life, by intellectual means, in a rational way, in a way that gives the best chances of success, then (1) to (4) must be built into the whole institutional/intellectual structure of academic inquiry.

In order to see that current academic inquiry, devoted primarily to the pursuit of knowledge, does indeed violate three of the above four rules of reason (when viewed from the standpoint of contributing to human welfare), two preliminary points need to be noted about the nature of the *problems* that academic inquiry ought to be trying to help solve.

First, granted that academic inquiry has, as its fundamental aim, to help promote human welfare, then the problems that academic inquiry fundamentally ought to try to help solve are problems of living, problems of action. From the standpoint of achieving what is of value in life, it is what we *do*, or refrain from doing, that ultimately matters. Even where new knowledge and technological know-how is relevant to the achievement of what is of value—as it is in medicine or agriculture, for example—it is always what this new knowledge or technological know-how enables us to *do* that matters. All the global problems discussed above require, for their resolution, not merely new knowledge, but rather new policies, new institutions, new ways of living. Scientific knowledge, and associated technological know-how have, if anything, as we have seen, contributed to the creation of these problems in the first place. Thus problems of living—problems of poverty, ill-health, injustice, and deprivation—are solved by what we do, or refrain from doing; they are not solved by the mere provision of some item of knowledge.[7]

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[6] For more details see ibid., chapters 3 and 4.

[7] The exception to this, of course, is when one has a problem of living that just is: to acquire some item of knowledge. A scientist, or other academic, who in his or her professional capacity, actively seeks to acquire some item of knowledge has, in this professional capacity, a problem of living that *is* a problem of knowledge; and the solution to the problem of knowledge, when grasped by the person, *is* the solution to the problem of living. But we have many desirable goals in life besides acquisition of knowledge, such as to be healthy, gainfully employed, to enjoy

Second, in order to achieve what is of value in life more successfully than we do at present, we need to discover how to resolve conflicts and problems of living in more *cooperatively rational* ways than we do at present. There is a spectrum of ways in which conflicts can be resolved, from murder or all-out war at the violent end of the spectrum, via enslavement, threat of murder or war, threats of a less extreme kind, manipulation, bargaining, and voting, to cooperative rationality at the other end of the spectrum, those involved seeking, by rational means, to arrive at that course of action that does the best justice to the interests of all those involved. A basic task for a kind of academic inquiry that seeks to help promote human welfare must be to discover how conflict resolution can be moved away from the violent end of the spectrum toward the cooperatively rational end.

Granted all this, and granted that the above four rules of reason are put into practice then, at the most fundamental level, academic inquiry needs to:

(1) Articulate, and seek to improve the articulation of, personal, social and global problems of living that need to be solved if the quality of human life is to be enhanced (including those indicated in section 1 above).

(2) Propose and critically assess alternative possible solutions—alternative possible *actions*, *policies*, *political programs*, *legislative proposals*, *ideologies*, and *philosophies of life*.

In addition, of course, academic inquiry must:

(3) Break the basic problems of living up into subordinate, specialized problems—in particular, specialized problems of knowledge and technology.

(4) Interconnect basic and specialized problem-solving.

Academic inquiry as it mostly exists at present can be regarded as putting (3) into practice to splendid effect. The intricate maze of specialized disciplines devoted to improving knowledge and technological know-how that go to make up current academic inquiry are the result. But, disastrously, what we have at present, a kind of academic inquiry devoted to improving knowledge, fails to put (1), (2), and (4) into practice. In pursuing knowledge, academic inquiry may articulate problems of knowledge, and propose and critically assess possible solutions, possible claims to knowledge—factual theses, observational and experimental results, and theories. But, as we have seen, problems of *knowledge* are not (in general) problems of *living*; and solutions to problems of *knowledge* are not (in general) solutions to problems of *living*.

In short, academic inquiry devoted to the pursuit of knowledge, when construed as having the basic humanitarian aim of helping to enhance the quality of human life by intellectual means, fails to put the two most elementary rules of

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friendship and love, to care for one's children, or to create things of value. All such life-aims, when frustrated, generate problems of living that are not necessarily also problems of knowledge.

reason into practice. Academic inquiry fails to do what it most needs to do, namely, (1) articulate problems of living, and (2) propose and critically assess possible solutions. And furthermore, as a result of failing to explore the basic problems that need to be solved, academic inquiry cannot put the fourth rule of rational problem-solving into practice either, namely, (4) interconnect basic and specialized problem-solving. As I have remarked, *three* of the four most elementary rules of rational problem-solving are violated.

This gross irrationality of contemporary academic inquiry, of knowledge-inquiry, is no mere formal matter. It has profoundly damaging consequences for humanity. As I have pointed out above, granted that our aim is to contribute to human welfare by intellectual means, the basic problems we need to discover how to solve are problems of living, problems of action, not problems of knowledge. In failing to give intellectual priority to problems of living, knowledge-inquiry fails to tackle what most needs to be tackled in order to contribute to human welfare. In devoting itself to acquiring knowledge in a way that is unrelated to sustained concern about what humanity's most urgent problems are, as a result of failing to put (1) and (2) into practice, and thus failing to put (4) into practice as well, the danger is that scientific and technological research will respond to the interests of the powerful and the wealthy, rather than to the interests of the poor, of those most in need. Priorities of scientific research, globally, do indeed reflect the interests of the first world, rather than those of the third world. Knowledge and technology successful pursued in a way that is not rationally subordinated to the tackling of more fundamental problems of living, through the failure to put (1), (2), and (4) into practice, is bound to lead to the kind of global problems discussed above, problems that arise as a result of new powers to act being divorced from the ability to act wisely. The creation of our current global problems, and our inability to respond adequately to these problems, has much to do, in other words, with the long-standing, rarely noticed, structural *irrationality* of our institutions and traditions of learning, devoted as they are to acquiring knowledge dissociated from learning how to tackle our problems of living in more cooperatively rational ways. Knowledge-inquiry, because of its irrationality, is designed to *intensify*, not help *solve*, our current global problems.

To sum up: we need to *learn* how to tackle our problems of living in wiser ways than we do at present; for this we require institutions and traditions of learning that put (1) and (2) into practice, thus satisfying elementary requirements for rationality; but this we do not have at present, because academic inquiry at present fails to put (1) and (2) into practice, and instead devotes itself to the pursuit of knowledge irrationally dissociated from a more fundamental concern with problems of living. We urgently need academia to create a tradition of imaginative and critical exploration of our problems of living and what we might do about them, unconstrained by government, commerce, religious dog-

ma, or public opinion. We cannot expect this to be done by politicians, civil servants, journalists, or religious leaders.

At this point, it may be objected that academia does discuss problems of living. This goes on in the less theoretical, more practical parts of the social sciences, such as psychiatry, social administration, and economics, and in such disciplines as medicine, human geography, development studies, engineering, politics, international affairs, environmental studies, peace and war studies, and even philosophy.

To begin with, nothing that I say here is intended to decry the work of those academics who do tackle problems of living, and do put (1) and (2) into practice. Everything I say here is intended to support such work. My claim is, however, that such work is at odds with, and must fight against, current intellectual standards and priorities, stemming as they do from the basic edicts of knowledge-inquiry. What we need is intellectual standards that encourage, instead of opposing, such work.

It needs to be noted, first, that in so far as there is academic discussion of problems of living, this goes on very much at the periphery of the academic enterprise.[8] It is hardly engaged in as the fundamental intellectual activity of academic inquiry as a whole, influencing research in other areas in accordance with rule (4).

And there is a good reason for this marginalization of discussion of problems of living. Such discussion is at odds with the basic edicts of knowledge-inquiry. What our problems of living are, and what we need to do in order to resolve them, is never merely a factual issue, a matter about which we can have factual knowledge. A problem of living arises, roughly, when a person, or a group of people, fails to attain some legitimate, achievable, desirable, or desired aim. It is clear, at once, that values are involved, quite essentially: what is "legitimate" and "desirable" involves questions of value, and moral and legal questions. This is equally true of any proposed solution to a problem of living, a proposed action, policy, plan, political philosophy, or piece of legislation. In putting such a thing forward as a proposed solution to a problem of living, value-judgments, of one kind or another, will invariably be involved. A kind of inquiry that restricts itself to the pursuit of factual knowledge excludes values from the intellectual domain of inquiry, and must, therefore, exclude representations of problems of living, and proposals for their resolution. At most, inquiry of this type can acquire factual knowledge about problems of living and how they are to be solved *given some set of values*—a political philosophy, a philosophy of life, being assumed. Or, knowledge can be developed about what people in fact hold to be problems of living, and what should be done about them. But these are not adequate substitutes for the tasks of (1) articulating problems of living, and (2)

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[8] For a survey of academic work, from science to the humanities, that bears out this point, see my *From Knowledge to Wisdom*, chapter 6.

proposing and critically assessing possible solutions, without restrictions. Academics cannot put forward ideas as to how our problems of living might be solved within the framework of knowledge-inquiry, because such ideas are *proposals for action*, not claims to knowledge; they involve an admixture of values and facts, ideals and methods, and none of this is acceptable or rational, according to the intellectual standards of knowledge-inquiry. Knowledge-inquiry demands of acceptable academic contributions that they be potential contributions to factual knowledge. Current scientific standards demand, even more restrictively, that potential contributions to science be empirically *testable*. Possible solutions to problems of living simply do not qualify, however practical, effective, desirable, intelligent, and wise they may be.

Recently, I had a look at thirty-four introductory textbooks on sociology, chosen at random, published between 1985 and 1997, to see how the subject is defined. If tackling problems of living intellectually is basic, and not peripheral, to academic inquiry as a whole, then certainly this will be basic to sociology, and will register in introductory texts on the subject. I found that sociology is defined in such terms as "the scientific study of human society and social interactions", "the *systematic, sceptical study of human society*", or as having as its basic aim "to understand human societies and the forces that have made them what they are".[9] Some books take issue with the idea that sociology is the *scientific* study of society, or protest at the male-dominated nature of sociology.[10] Nowhere was there a whisper of the idea that sociology might have, as a basic aim, to help people solve social problems of living.

5. PROBLEM-SOLVING WISDOM-INQUIRY

Inquiry devoted primarily to the pursuit of knowledge is, then, grossly and damagingly irrational when judged from the standpoint of contributing to human welfare by intellectual means. At once the question arises: What would a kind of inquiry be like that is devoted, in a genuinely rational way, to promoting human welfare by intellectual means? I shall call such a hypothetical kind of inquiry *wisdom-inquiry*, to stand in contrast to knowledge-inquiry.

As a first step at characterizing wisdom-inquiry, we may take knowledge-inquiry (at its best) and modify it just sufficiently to ensure that all four elementary rules of rational problem-solving are built into its intellectual and institutional structure. The result has already been sketched in section 2 above, and will be indicated in greater detail below, in sections 7 and 8. Here, very briefly,

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[9] These quotations come, respectively, from H. Tischler, *Introduction to Sociology* (Orlando: Harcourt Brace, 1994), p. 4; J. Macionis and K. Plummer, *Sociology: A Global Introduction* (New York: Prentice Hall, 1997), p. 4; G. Lenski *et al.*, *Human Societies: An Introduction to Macrosociology* (New York: McGraw-Hill, 1995), p. 5.

[10] See, for example, P. Abott and C. Wallace, *An Introduction to Sociology: Feminist Perspectives* (London: Routledge, 1990), p. 3 and p. 1.

to keep repetition to a minimum, is an indication of some structural changes that need to be made to knowledge-inquiry to ensure that (1) to (4) are all implemented.

The primary change that needs to be made is to ensure that academic inquiry implements (1) and (2). It becomes the fundamental task of social inquiry (1) to articulate, and seek to improve the articulation of, our problems of living, and (2) to propose and critically assess possible solutions, from the standpoint of their practicality and desirability. In particular, social inquiry has the task of discovering how conflicts may be resolved in less violent, more cooperatively rational ways. It also has the task of promoting such increasingly cooperatively rational tackling of problems of living in the social world beyond academe. Social inquiry is, thus, not primarily social *science*, nor, primarily, concerned to acquire knowledge of the social world; its primary task is to promote more cooperatively rational tackling of problems of living in the social world. Pursued in this way, social inquiry is intellectually more fundamental than the natural and technological sciences, which tackle subordinate problems of knowledge, understanding, and technology, in accordance with rule (3). Indeed, the thinking that we engage in as we live, in seeking to realize what is of value to us, is intellectually more fundamental than the whole of academic inquiry (which has, as its basic purpose, to help cooperatively rational thinking and problem-solving in life to flourish). Academic thought emerges as a kind of specialization of personal and social thinking in life, the result of implementing rule (3); this means there needs to be a two-way interplay of ideas, arguments and experiences between the social world and academia, in accordance with rule (4).

The natural and technological sciences need to recognize three domains of discussion: evidence, theory, and aims. The latter seeks to identify that highly problematic region of overlap between that which is discoverable, and that which it is of value to discover. Discussion of what it is of value to discover interacts with social inquiry, in accordance with rule (4).

As I remarked above, in section 2, academic inquiry needs to become somewhat like a people's civil service, having just sufficient power to retain its independence and integrity, doing for people, openly, what civil services are supposed to do, in secret, for governments. The overall aim of inquiry becomes to promote personal, social, and global wisdom.

Among the many questions that may be asked about the argument so far, there are three that I shall try to answer in what follows. First, can academic inquiry, as it exists at present, really be as radically and damagingly irrational as I have argued it is? How and when did this irrationality become established? Second, is problem-solving wisdom-inquiry, as just sketched, really an improvement over knowledge-inquiry? This kind of inquiry seeks solutions to problems of living that contribute to human welfare. But whose welfare, what kind of welfare, and who decides? How are crucial questions about what is of value, inherent in the aims of inquiry, to be decided? And third, what role does

wisdom-inquiry give to science and scholarship pursued for their own sake, and not in order to solve practical problems of living? In what follows I take these questions in turn.

6. THE TRADITIONAL ENLIGHTENMENT

The irrationality of contemporary academic inquiry has its roots in blunders made by the *philosophes* of the eighteenth-century Enlightenment.

A basic idea of the Enlightenment, perhaps *the* basic idea, was to try to learn from scientific progress how to go about making social progress toward an enlightened world. The *philosophes*, Voltaire, Diderot, Condorcet, and others, did what they could to put this immensely important 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 labored to promote rationality in personal and social life.[11]

Unfortunately, in developing the Enlightenment idea intellectually, the *philosophes* blundered. They thought the task was to develop the social sciences alongside the natural sciences. I shall call this the *traditional Enlightenment Program*. It was developed throughout the nineteenth century, by Comte, Marx, Mill, and others, and built into the institutional structure of universities during the twentieth century, with the creation of departments of anthropology, economics, sociology, psychology, and political science.[12] Knowledge-inquiry, as we have it today, by and large, is the result. But, from the standpoint of creating a kind of inquiry designed to help humanity learn how to become civilized, all this amounts to a series of monumental blunders.

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

1. The progress-achieving methods of science need to be correctly identified.

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[11] The best overall account of the Enlightenment that I know of is still: P. Gay, *The Enlightenment: An Interpretation* (London: Wildwood House, 1973).

[12] See, for example: R. Aron, *Main Currents in Sociological Thought*, 2 vols. (London: Penguin, 1968–1970); J. Farganis, ed., *Readings in Social Theory: The Classic Tradition to Post-Modernism* (New York: McGraw-Hill, 1993); F. A. Hayek, *The Counter-Revolution of Science: Studies on the Abuse of Reason* (Indianapolis: Liberty Press, 1979); R. Heilbroner, *The Worldly Philosophers: The Lives, Times and Ideas of the Great Economic Thinkers* (New York: Simon and Shuster, 1980); A. Giddens, *Capitalism and Modern Social Theory: An Analysis of the Writings of Marx, Durkheim, and Max Weber* (Cambridge, England: Cambridge University Press, 1971); G. Duncan, *Marx and Mill* (Cambridge, England: Cambridge University Press, 1978).

2. These methods need to be correctly generalized so that they become fruitfully applicable to any human endeavor, whatever the aims may be, and not just applicable to the endeavor of improving knowledge.
3. The correctly generalized progress-achieving methods then need to be exploited correctly in the great human endeavor of trying to make social progress toward an enlightened, wise, civilized world.

Unfortunately, the *philosophes* of the Enlightenment got all three steps disastrously 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. That the *philosophes* made these blunders in the eighteenth century is forgivable; what is unforgivable is that these blunders still remain unrecognized and uncorrected today, over two centuries later.

The Enlightenment, and what it led to, has long been criticized, by the Romantic movement, by what Isaiah Berlin has called "the counter-Enlightenment",[13] and more recently by the Frankfurt school, by postmodernists, and others.[14] The criticism of the traditional Enlightenment of this essay is different. In particular, it is the very opposite of all those anti-rationalist, romantic, and postmodernist criticisms which object to the way the Enlightenment gives far too great an importance to natural science and to scientific rationality. According to the argument of this essay, what is wrong with the traditional Enlightenment, and the kind of academic inquiry we now possess derived from it, is not too much "scientific rationality" but, on the contrary, not enough. As we have already seen, 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.

The view I argue for is far from being a victory of traditional rationalism over romanticism. If anything, it is a synthesis of the two. 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

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[13] I. Berlin, *The Roots of Romanticism*; and *Against the Current* (London: Hogarth Press, 1980), pp. 1–24.

[14] For a clearly written, sympathetic, but critical discussion of criticisms of the Enlightenment, from Horkheimer and Adorno, via Lyotard, Foucault, Habermas, and Derrida to MacIntyre and Rorty, see A. Gascardi, *Consequences of Enlightenment* (Cambridge, England: Cambridge University Press, 1999). For less sympathetic criticisms of postmodernists' anti-rationalism, see: A. Sokal and J. Bricmont, *Intellectual Impostures* (London: Profile Books, 1998); P. Gross, *et al.*, eds., *The Flight from Science and Reason* (New York: Annals of the New York Academy of Sciences, 1996); N. Koertge, ed., *A House Built on Sand: Exposing Postmodernist Myths about Science* (Oxford: Oxford University Press, 1998).

argument. Traditional rationalism takes its inspiration from science and method; romanticism takes its inspiration from art, from imagination, and from passion. The view I argue for 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. In order to discover what is of value, we need to attend to our desires, our emotional responses; but not everything we desire is desirable, and not everything that feels good is good. What we need, for wisdom, is an interplay of skeptical rationality and emotion, an interplay of mind and heart, so that we may develop mindful hearts and heartfelt minds. It is time we healed the great rift in our culture, so graphically depicted by C. P. Snow.[15]

7. THE NEW ENLIGHTENMENT

What, then, in a little more detail, are the three great blunders of the traditional Enlightenment, still built into the intellectual/institutional structure of academic inquiry today, and what needs to be done to put them right? Let us take the three blunders in turn.

The *first* blunder concerns the nature of the progress-achieving methods of science. Scientists and philosophers of science today make the assumption, inherited from the Enlightenment,[16] that science makes progress because, in science, theories are assessed impartially on the basis of evidence alone, *no permanent assumption being made about the nature of the universe independent of evidence*. Choice of theory in science may be influenced by such considerations as the relative simplicity, unity, or explanatory power of the theories in question, in addition to empirical considerations; this is permissible, as long as it does not involve assuming, permanently, that nature herself is simple, unified or comprehensible.[17]

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[15] C. P. Snow, *The Two Cultures: And a Second Look* (Cambridge, England: Cambridge University Press, 1986).

[16] The *philosophes* of the Enlightenment tended to assume that the triumph of Newtonian science over Cartesian science meant also the triumph of Newtonian inductivist methodology over Cartesian rationalism. They tended to espouse the extreme empiricism of Bacon and Locke, rejecting the rationalism of Descartes. But there are exceptions, such as Kant. And d'Alembert hardly fits into the extreme empiricist view when he asserts: "The universe, if we may be permitted to say so, would only be one fact and one great truth for whoever knew how to embrace it from a single point of view" (J. D'Alembert, *Preliminary Discourse to the Encyclopedia of Diderot* [New York: Bobbs-Merrill, {1751} 1963], p. 29.

[17] Karl Popper formulates this widely held view like this: ". . . in science, only observation and experiment may decide upon the *acceptance or rejection* of scientific statements, including laws and theories"; K. Popper, *Conjectures and Refutations* (London: Routledge and Kegan Paul, 1963), p. 54. For an indication of just how widely held standard empiricism is, see my *The Comprehensibility of the Universe* (Oxford: Oxford University Press, 1998), pp. 38–45.

But this orthodox *standard empiricist* assumption about the nature of the progress-achieving methods of science is untenable.[18] Given any scientific theory, however well verified empirically, there will always be infinitely many rival theories, equally well supported by the evidence, which make different predictions, in an arbitrary way, for phenomena not yet observed. One can set out to refute these rival theories by making the relevant observations or experiments, but as there are infinitely many of them, this may take some time. In short, if science really did take seriously the idea that theories must be selected on the basis of evidence alone, science would be swamped by an infinity of empirically equally successful rival theories; science would come to an end.[19]

This does not happen in scientific practice because, in practice, given an accepted, well verified theory, such as Newtonian theory, quantum theory, or general relativity, almost all the infinitely many equally empirically successful rival theories are, in comparison, grotesquely *ad hoc* and disunified. They postulate, arbitrarily, that, for example, at some time in the future Newton's inverse square law of gravitation becomes an inverse cube law. Such theories are, in practice, excluded from scientific consideration on the grounds that they lack simplicity, unity, or explanatory power.

Now comes the crucial point. In persistently excluding infinitely many such empirically successful but grotesquely *ad hoc* theories, science in effect makes a big assumption about the nature of the universe, to the effect that it is such that no grotesquely *ad hoc* theory is true, however empirically successful it may appear to be for a time. Without some such big assumption as this, the empirical method of science collapses. Science is drowned in an infinite ocean of empirically successful *ad hoc* theories.[20]

At once the question arises: Granted that science must make some kind of big assumption about the nature of the universe if it is to be possible at all, what precisely ought this assumption to be, and on what basis is it to be made? We must make some assumption about the ultimate nature of the universe before science can proceed at all; if science is to proceed successfully, we must make

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[18] It is worth noting that Newton upheld a conception of natural philosophy (natural science) that is, in important respects, more sophisticated than standard empiricism, presupposed by so many twentieth-century scientists and philosophers of science. Newton formulates three of his four rules of reasoning in such a way that it is clear that these rules make assumptions about the nature of the universe. Thus rule 1 asserts: "*We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances*." And Newton adds: "To this purpose the philosophers say that nature does nothing in vain, and more is in vain when less will serve; for Nature is pleased with simplicity, and affects not the pomp of superfluous causes." See I. Newton, *Principia*, vol. 2 (Berkeley: University of California Press, 1962), p. 398. Newton seems to have understood that persistently preferring simple theories means that nature herself is being persistently assumed to be simple (which violates standard empiricism).

[19] See my *The Comprehensibility of the Universe*, pp. 45–56.

[20] For a much more detailed exposition and refutation of standard empiricism see ibid., chapters 1 and 2.

an assumption that is near enough correct: and yet it is just here that we are horribly ignorant, and are almost bound to get things hopelessly wrong.

The solution to this basic dilemma confronting the scientific endeavor (as expounded in some detail in my *The Comprehensibility of the Universe*) can be put like this: Cosmological speculation about the ultimate nature of the universe, being necessary for science to be possible at all, must be regarded as a part of scientific knowledge itself, however epistemologically unsound it may be in other respects. The best such speculation available is that the universe is comprehensible in some way or other and, more specifically, in the light of the immense apparent success of modern natural science, that it is physically comprehensible. But both these speculations may be false; in order to take this possibility into account, we need to adopt a hierarchy of increasingly contentless cosmological conjectures concerning the comprehensibility and knowability of the universe until we arrive at the conjecture that the universe is such that it is possible for us to acquire some knowledge of something, a conjecture so contentless that it could not be rational for us to reject it in any circumstances whatsoever. As a result of adopting such a hierarchy of increasingly contentless cosmological conjectures in this way, we maximize our chances of adopting conjectures that promote the growth of knowledge, and minimize our chances of taking some cosmological assumption for granted that is false and impedes the growth of knowledge.

Schematically, this hierarchical conception of scientific knowledge and method can be represented as follows, in terms of ten levels.

- Level 10: The universe is partially knowable, in the sense that we can acquire knowledge of our local circumstances sufficient to enable us to continue to live.
- Level 9: The universe is such that, something exists locally that makes local knowledge possible, which exists everywhere, thus making it possible to use local knowledge as a basis for acquiring some knowledge of what exists elsewhere.
- Level 8: Assumptions built into current methods for improving knowledge can be improved, thus leading to improved methods for improving knowledge.
- Level 7: The universe is roughly comprehensible, in the sense that it is such that some assumption of partial comprehensibility is empirically fruitful.
- Level 6: The universe is nearly comprehensible in that the assumption that it is perfectly comprehensible is empirically fruitful.
- Level 5: The universe is perfectly comprehensible (in the sense that something exists everywhere, which does not change but which determines, perhaps probabilistically, the way everything does change, and in terms of which all change and diversity can, in principle, be explained).

- Level 4: The universe is physically comprehensible (the ubiquitous "something" of level 5 being a physical entity, such as a unified field).
- Level 3: The best available more or less specific metaphysical assumption as to how the universe is physically comprehensible.
- Level 2: Best current fundamental physical theories.
- Level 1: Evidence.

As one goes up this hierarchy, from level 3 to level 10, the corresponding theses assert less and less; they are more and more likely to be true, and are less and less likely to need revision as science makes progress. Thus, the level 3 thesis has been revised many times since Galileo: initially the corpuscular hypothesis in the seventeenth century, this became the thesis that the universe is composed of point-particles interacting by means of a force at a distance in the eighteenth and nineteenth centuries, which in turn became the thesis that there is a unified field of force in the late nineteenth and early twentieth centuries, which transformed into the view that there is some kind of quantum field in curved space-time in the mid-twentieth century, now rejected in favor of string theory. The level 4 thesis was changed dramatically by Galileo, when he rejected Aristotelianism and adopted the view instead that "the book of nature is written in the language of mathematics"; but it has not undergone any such dramatic change since. Theses higher up in the hierarchy have not been modified.

Corresponding to each thesis, A, at each level above 2, there is a methodological rule which asserts: accept that thesis lower down in the hierarchy which (a) exemplifies, and is a special case of the thesis A, and which (b) is more empirically fruitful, or promises to be more empirically fruitful, than any rival at that level. Level 2 theories are accepted, which (a) meet with the greatest empirical success and (b) best exemplify the best available thesis at level 3.

The hope is that as we increase our knowledge about the world we improve (lower level) cosmological theses implicit in our methods, and thus in turn improve our methods. As a result of improving our knowledge, we improve our knowledge about how to improve knowledge. Science adapts its own nature to what it learns about the nature of the universe, thus increasing its capacity to make progress in knowledge about the world.[21]

This *aim-oriented empiricist* methodology, in stark contrast to current orthodoxy, is the key to the success of modern science. The basic aim of science of discovering how, and to what extent, the universe is comprehensible is deeply problematic; it is essential that we try to improve the aim, and associated methods, as we proceed, in the light of apparent success and failure. In order to do

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[21] For a much more detailed exposition and defence of aim-oriented empiricism, together with detailed accounts of what I mean by the thesis that the universe is comprehensible, or physically comprehensible, see my *The Comprehensibility of the Universe*, chapters 1 and 3 to 6. For a more recent summary, see my "Has Science Established that the Universe is Comprehensible?", *Cogito*, 13 (1999), pp. 139–145. See also my *Is Science Neurotic?*, chapters 1 and 2, and appendix.

this in the best possible way, we need to represent our aim at a number of levels, from the specific and problematic to the highly unspecific and unproblematic, thus creating a framework of fixed aims and meta-methods within which the (more or less specific) aims and methods of science may be progressively improved in the light of apparent empirical success and failure, as depicted above. The result is that, as we improve our knowledge about the world, we are able to improve our knowledge about how to improve knowledge, the methodological key to the rapid progress of modern science.

Adoption of this aim-oriented empiricist view by the scientific community as the official, orthodox conception of science would correct the first blunder of the traditional Enlightenment.

But what of the *second* blunder? The task, here, is to generalize the progress-achieving methods of science appropriately so that they become progress-achieving methods that are, potentially, fruitfully applicable to *any* problematic human endeavor. The task, in other words, is to generalize scientific rationality so that it becomes rationality *per se*, helping us to achieve what is of value whatever we may be doing.

Needless to say, scientists and philosophers, having failed to specify the methods of science properly, have also failed to arrive at the proper generalization of these methods. The best attempt known to me is that made by Karl Popper. According to Popper, science makes progress because it puts into practice the method of proposing theories as conjectures, which are then subjected to sustained attempted empirical refutation.[22] Popper argues that this can be generalized to form a conception of rationality, according to which one seeks to solve problems quite generally by putting forward conjectures as to how a given problem is to be solved, these conjectures then being subjected to sustained *criticism* (criticism being a generalization of attempted empirical refutation in science).[23] Rules (1) and (2) of rational problem-solving of section 4 above encapsulate Popper's critical rationalism. The *four* rules of section 4, taken together, improve on Popper's notion of rationality. Popper was too hostile to specialization to appreciate that it might have a rational purpose.

Popper's ideas about scientific method and how it is to be generalized are an improvement over eighteenth-century notions, but they are still defective, even when improved in the way indicated in section 4. Popper's conception of scientific method is defective because it is a version of standard empiricism, which we have already seen is untenable. It fails to identify the problematic aim of

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[22] See K. Popper, *Conjectures and Refutations*; and *The Logic of Scientific Discovery* (London: Hutchinson, 1959).

[23] "Inter-subjective *testing* is merely a very important aspect of the more general idea of inter-subjective *criticism*, or in other words, of the idea of mutual rational control by critical discussion", Popper, *The Logic of Scientific Discovery*, p. 44, n. 1. See also K. Popper, *Conjectures and Refutations*, pp. 193–200; *Unended Quest* (Glasgow: Fontana, 1976), pp. 115–116; *Objective Knowledge* (Oxford: Oxford University Press, 1972), pp. 119, 243.

science properly, and thus fails to specify the need for science to improve its aims and methods as it proceeds. Popper's notion of critical rationalism is defective in an analogous way. It does not make improving aims and methods, when aims are problematic, an essential aspect of rationality.

If, however, we take the above aim-oriented empiricist conception of scientific method as our starting point, and generalize that, the outcome is quite different. It is not just in science that aims are problematic; this is the case in life too, either because different aims conflict, or because what we believe to be desirable and realizable lacks one or other of these features, or both. Above all, the aim of creating global civilization, wisdom, or enlightenment is inherently and profoundly problematic.[24] Quite generally, then, and not just in science, whenever we pursue a problematic aim, we need to represent the aim as a hierarchy of aims, from the specific and problematic at the bottom of the hierarchy, to the general and unproblematic at the top. In this way, we provide ourselves with a framework within which we may improve more or less specific and problematic aims and methods as we proceed, learning from success and failure in practice what it is that is both of most value and realizable. Such an "aim-oriented" conception of rationality is the proper generalization of the aim-oriented, progress-achieving methods of science.[25] Aim-oriented rationality incorporates and improves on problem-solving rationality indicated in section 4 above.

So much for the second blunder, and how it is to be put right. We come now to the *third* blunder. This is by far the most serious of the three blunders made by the traditional Enlightenment. The basic Enlightenment idea, after all, is to learn from scientific progress how to make social progress toward an enlightened world. Putting this idea into practice involves getting appropriately generalized progress-achieving methods of science *into social life itself*! It involves getting progress-achieving methods into our institutions and ways of life, into government, industry, agriculture, commerce, international relations, the media, the arts, and education. But in sharp contrast to all this, the traditional Enlight-

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[24] There are a number of ways of highlighting the inherently problematic character of the aim of creating civilization. People have very different ideas as to what does constitute civilization. Most views about what constitutes utopia, an ideally enlightened or civilized society, have been unrealizable *and* profoundly undesirable. People's interests, values, and ideals clash. Even values that, one may hold, ought to be a part of civilization may clash. Thus, freedom and equality, even though inter-related, may nevertheless clash. It would be an odd notion of individual freedom that held that freedom was for some, and not for others; and yet if equality is pursued too singlemindedly this will undermine individual freedom, and will even undermine equality, in that a privileged class will be required to enforce equality on the rest, as in the old Soviet Union. A basic aim of legislation for civilization, we may well hold, ought to be to increase freedom by restricting it: this brings out the inherently problematic, paradoxical character of the aim of achieving civilization.

[25] For a much more detailed exposition of aim-oriented rationality, see my *From Knowledge to Wisdom*, especially chapters 5 and 8. See also my *Is Science Neurotic?*, chapters 3 and 4.

enment has sought to apply generalized scientific method, not to social *life*, but merely to social *science*! Instead of helping humanity learn how to create a wiser, more enlightened, civilized world by increasingly cooperatively rational means, the traditional Enlightenment has sought merely to help social scientists improve knowledge of social phenomena. The outcome is that today academic inquiry devotes itself to acquiring knowledge of natural and social phenomena, but does not attempt to help humanity learn how to make progress toward a wise world. This is the key blunder which, built into the intellectual/institutional structure of academic inquiry today, produces a kind of inquiry brilliant at acquiring knowledge, but hopeless and damagingly irrational when it comes to promoting global wisdom. This is the blunder that leads to a kind of inquiry that violates the three elementary rules of rational problem-solving indicated in section 4.

It is this third, monumental and disastrous blunder that requires, for its correction, a revolution in the nature of academic inquiry, beginning with social inquiry and the humanities.[26] Social inquiry is not, as I have already stressed, primarily social *science*. Its proper basic task is to help humanity build into institutions and social life quite generally the progress-achieving methods of aim-oriented rationality (arrived at by generalizing the progress-achieving methods of science as indicated above). Social inquiry (sociology, economics, anthropology, and the rest) is thus social *methodology* or social *philosophy*. Its task is to help diverse valuable human endeavors and institutions gradually improve aims and methods so that the world may make social progress toward global enlightenment. And the primary task of academic inquiry, more generally, becomes to help humanity solve its problems of living in increasingly rational, cooperative, enlightened ways, thus helping humanity become more civilized. What the philosophy of science is to science within the framework of aim-oriented empiricism, namely an integral and influential part of the scientific endeavor, which seeks to improve the aims and methods of science, so social inquiry is to the rest of the social world, an integral and influential part of the humanitarian endeavor to make progress toward a wiser world by improving the aims and methods of our diverse institutions and social pursuits. On this view, the sociology of science, in particular, *is* the philosophy of science.

The basic aim of academic inquiry becomes to promote the growth of *wisdom*. I have already given a brief characterization of what I take wisdom to be, in section 2 above. In a little more detail, wisdom can be understood to be the capacity (and perhaps the active desire) to realize what is of value in life, for oneself and others. Wisdom includes knowledge, technological know-how, and understanding (so that those parts of inquiry devoted to improving these can contribute to improving wisdom). But wisdom includes much else besides, such

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[26] For a more detailed exposition of the nature of the revolution that is required, see my *From Knowledge to Wisdom*, especially chapters 4 to 11; and *Is Science Neurotic?*, chapters 3 and 4.

as 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 help realize what is of value for oneself and others, the capacity to help solve those problems of living that arise in connection with attempts to realize what is of value, and 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. In seeking to promote wisdom, academic inquiry has the task of helping us develop wiser ways of living, wiser institutions, customs, social relations, and a wiser world. The phrase "to realize what is of value" is to be interpreted to mean both "to become aware of what is of value" and "to make real or actual what is of value potentially." Inquiry devoted to promoting wisdom, to helping us "realize" what is of value, supports both inquiry pursued for its own sake, for the sake, that is, of seeing and searching as ends in their own right, on the one hand, and inquiry pursued for the sake of achieving other goals of value, on the other hand. In other words, both so-called "pure" and "applied" science and scholarship have their place within inquiry devoted to the pursuit of wisdom.

As I have already stressed, the aim of achieving global wisdom or civilization is inherently problematic. This means, according to aim-oriented rationality, that we need to represent the aim at a number of levels, from the specific and highly problematic to the unspecific and unproblematic. Just as the inherently problematic aim of science needs to be represented at a number of levels, so that a framework of fixed aims and methods can be created within which more specific and more problematic aims and methods can be improved with improving knowledge, so likewise, in connection with the endeavor to create a wiser, more civilized world, this inherently and profoundly problematic aim needs to be represented at a number of levels. This needs to be done so that, just as in science, a framework of fixed, unproblematic aims and methods can be created within which more specific, problematic aims and methods can be improved in the light of the success and failure of various initiatives—political, moral, institutional, and cultural.

Here is a cartoon sketch of the kind of thing that we require:

- Level 7: Civilization(5)—That ideal, realizable social order, whatever it may be, that we ought to try to attain in the long term.
- Level 6: Civilization(4)—A world in which everyone shares equally in enjoying, sustaining and creating what is of value, in so far as this is possible.
- Level 5: Civilization(3)—A world that is democratic, liberal, just, sustainable, rational, and wise.
- Level 4: Civilization(2)—A world with global democracy that puts the new Enlightenment into practice.

- Level 3: Civilization(1)—Best current specific ideas for world civilization.
- Level 2: Policies, projects, new laws, institutions, and political programs.
- Level 1: Human experience (history); what people enjoy and suffer.

As a result of building into our institutions and social life such a hierarchical structure of aims and associated methods, we create a framework within which it becomes possible for us progressively to improve our real-life aims and methods in increasingly cooperative ways as we live. Diverse philosophies of life—diverse religious, political, economic, and moral views—may be cooperatively developed, assessed and tested against the experience of personal and social life. It becomes possible progressively to improve diverse *philosophies of life* (diverse views about what is of value in life and how it is to be realized) much as *theories* are progressively and cooperatively improved in science. This is the methodological key to humanity discovering how gradually to acquire greater wisdom, by means of experience and cooperative rationality.

We have here, too, the nub of the solution to the problem of how decisions can be reached about what aims and ideals ought to be pursued, what values adopted. As a result of representing our aims, ideals, and values in the hierarchical form of aim-oriented rationality, we create the possibility of learning what aims we should pursue, what values we should adopt, as we live and act. We create the possibility of resolving problems and conflicts concerning aims, ideals, and values in cooperatively rational ways. As I have already indicated, a spectrum of methods exists for resolving conflicts, from annihilation of the opposition at the extreme violent end of the spectrum, to wise cooperative rationality at the opposite end. All that academia can hope to do is to help humanity gradually move from the violent end of the spectrum toward the more cooperative end, to the extent that this is possible and desirable.

Academia does not decide for the rest of humanity what aims ought to be pursued, what values upheld; rather it seeks to represent the best aims and values, at various levels, wherever these may come from, whoever may adopt or espouse them. Academic thought emerges as a result of dialogue between academics and non-academics: ideas, arguments and experiences go to and fro in both directions. In the end, what really matters is the thinking we engage in as we live, guiding our actions. Academic thought is a kind of specialization of this *living* thinking, the outcome of implementing rule (3). It is important, then, that the thinking, the problem-solving, that we engage in as we live, influences and is influenced by more specialized academic thought, in accordance with rule (4). It is vital that it is not necessary to have a Ph.D. before one can contribute to academic thought, contributions being assessed on their merit, and not on the credentials of authors.

What of the third question raised at the end of section 5, concerning the place of inquiry pursued for its own sake within wisdom-inquiry?

Not only does wisdom-inquiry stress the vital importance of inquiry pursued for its own sake; in addition, a part of the case for wisdom-inquiry is that it does better justice to this aspect of inquiry, in addition to the practical aspects of inquiry, than does knowledge-inquiry.

According to wisdom-inquiry, the basic aim of inquiry is to help us realize what is of value, "realize" meaning *both* to apprehend, and to make real. Inquiry pursued for the sake of apprehending what is of value corresponds to what is often called "pure" research, or inquiry pursued for its own sake. It is theoretical physics pursued in order to enhance our knowledge and understanding of the dynamical structure of this mysterious universe we find ourselves in. It is biology pursued in order to enhance our knowledge and understanding of the rich variety of living things on earth, their physical structure, their extraordinary diversity of design, their ways of life. It is astronomy and cosmology pursued in order to improve our knowledge and understanding of the universe. It is geology pursued in order to increase our knowledge of the earth's structure, and its history. It is history pursued in order to improve our knowledge and understanding of past human events, people, ways of living, and so on. Inquiry, viewed from this perspective, might be regarded as a collection of intellectual spectacles, telescopes, and microscopes, manufactured for us to *use* in order to aid our exploration of our world.

There are a number of ways in which the philosophy of wisdom does better justice to this "intellectual" or "cultural" aspect of inquiry than does the philosophy of knowledge. I shall indicate just three.

(1) From the standpoint of the intellectual or cultural aspect of inquiry, what really matters is the desire that people have to see, to know, and to understand, the passionate curiosity that individuals have about aspects of the world, and the knowledge and understanding that people acquire and share as a result of actively following up their curiosity. An important task for academic thought in universities is to encourage non-professional thought to flourish outside universities. As Einstein once remarked "Knowledge exists in two forms—lifeless, stored in books, and alive in the consciousness of men. The second form of existence is after all the essential one; the first, indispensable as it may be, occupies only an inferior position."[27]

Wisdom-inquiry is designed to promote all this in a number of ways. It does so as a result of holding thought, at its most fundamental, to be the personal thinking we engage in as we live. It does so by recognizing that acquiring knowledge and understanding involves articulating and solving personal problems that one encounters in seeking to know and understand. It does so by recognizing that passion, emotion, and desire, have a rational role to play in inquiry, disinterested research being a myth. Again, as Einstein has put it "The

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[27] A. Einstein, *Ideas and Opinions* (London: Souvenir Press, 1973), p. 80.

most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science. Whoever does not know it and can no longer wonder, no longer marvel, is as good as dead, and his eyes are dimmed."[28]

Knowledge-inquiry, by contrast, all too often fails to nourish "the holy curiosity of inquiry",[29] and may even crush it out altogether. Knowledge-inquiry gives no rational role to emotion and desire; passionate curiosity, a sense of mystery, of wonder have, officially, no place within the rational pursuit of knowledge. The intellectual domain becomes impersonal and split off from personal feelings and desires; it is difficult for "holy curiosity" to flourish in such circumstances. Knowledge-inquiry hardly encourages the view that inquiry at its most fundamental is thinking that goes on as a part of life; on the contrary, it upholds the idea that fundamental research is highly esoteric, conducted by physicists in contexts remote from ordinary life. Even though the aim of inquiry may, officially, be *human* knowledge, the personal and social dimension of this is all too easily lost sight of, and progress in knowledge is conceived of in impersonal terms, stored lifelessly in books and journals. Rare is it for popular books on science to take seriously the task of exploring the fundamental problems of a science in as accessible, non-technical, and intellectually responsible a way as possible. Such work is not highly regarded by knowledge-inquiry, as it does not contribute to "expert knowledge". The failure of knowledge-inquiry to take seriously the highly problematic nature of the aims of inquiry leads to insensitivity as to what aims are being pursued, to a kind of institutional hypocrisy. Officially, knowledge is being sought "for its own sake", but actually the goal may be immortality, fame, or the flourishing of one's career or research group, as the existence of bitter priority disputes in science indicates. Education suffers. Science students are taught a mass of established scientific knowledge, but may not be informed of the *problems* that gave rise to this knowledge, the problems that scientists grappled with in creating the knowledge. Even more rarely are students encouraged themselves to grapple with such problems. And rare, too, is it for students to be encouraged to articulate their own problems of understanding that must inevitably arise in absorbing all this information, or to articulate their instinctive criticisms of the received body of knowledge. All this tends to reduce education to a kind of intellectual indoctrination, and serves to kill "holy curiosity". Officially, courses in universities divide up into those that are vocational, like engineering, medicine, and law, and those that are purely educational, like physics, philosophy, or history. What is not noticed—again through insensitivity to problematic aims—is that the supposedly purely educational are actually vocational as well: the student is being trained to be an aca-

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[28] Ibid., p. 11.

[29] A. Einstein, "Autobiographical Notes", in *Albert Einstein: Philosopher-Scientist*, ed. P. A. Schilpp (La Salle, Illinois: Open Court, 1949), p. 17.

demic physicist, philosopher, or historian, even though only a minute percentage of the students will go on to become academics. Real education, which must be open-ended, and without any pre-determined goal, rarely exists in universities, and yet no one notices.

(2) In order to enhance our understanding of persons as beings of value, potentially and actually, we need to understand them empathically, by putting ourselves imaginatively into their shoes, and experiencing, in imagination, what they feel, think, desire, fear, plan, see, love, and hate. For wisdom-inquiry, this kind of empathic understanding is rational and intellectually fundamental. Articulating problems of living, and proposing and assessing possible solutions is, we have seen, the fundamental intellectual activity of wisdom-inquiry. But it is just this that we need to do to acquiring empathic understanding. Social inquiry, in tackling problems of living, is also promoting empathic understanding of people. Empathic understanding is essential to wisdom. Elsewhere I have argued, indeed, that empathic understanding plays an essential role in the evolution of consciousness. It is required for cooperative action, and even for science.[30]

Granted knowledge-inquiry, on the other hand, empathic understanding hardly satisfies basic requirements for being an intellectually legitimate kind of explanation and understanding. In empathically understanding another person, I do not have a predictive, testable theory of that other person; my understanding seems merely intuitive, personal, emotional, subjective, and evaluative, and thus not a potential contribution to knowledge. Psychology pursued within the context of knowledge-inquiry seeks to develop factual, predictive theories of human behavior (including theories about the capacity of people to acquire empathic understanding of each other). In conceiving of others and ourselves in such terms, we are led to construe people as value-neutral, factual entities; even worse, just as the use of predictive theories of natural science is to enable us to manipulate natural phenomena, the standard use of predictive psychological theories is to enable us to manipulate people, for example, in connection with advertising. In inviting us to see our fellow human beings in such a way, this kind of knowledge is hardly of intrinsic value.

Wisdom-inquiry enhances our capacity to see and understand what is of value, potentially and actually, in the lives of others; it helps us to understand others both from their own point of view, and from a more objective standpoint; and it helps such things as cooperative action, communication, friendship, and love to flourish. Knowledge-inquiry, by contrast, encourages us to see people in

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[30] For my fuller accounts of empathic understanding (or "person-to-person," or "personalistic" understanding), and the fundamental role that this kind of understanding has in human life, and in wisdom-inquiry, see my *From Knowledge to Wisdom*, pp. 171–189 and chapter 10. See also my *The Human World in the Physical Universe*, chapters 5–7 and 9.

purely factual terms, robbed of significance and value, things to be manipulated as we might manipulate natural phenomena.

(3) Wisdom-inquiry does better justice to the intellectual value of theoretical physics and cosmology, than does knowledge-inquiry. Wisdom-inquiry resurrects natural philosophy—theoretical physics as the philosophical quest to understand the nature of the universe. Aim-oriented empiricism (the philosophy of science associated with wisdom-inquiry) does full justice to this aspect of science. It holds that, in order to be acceptable, a theory must (a) unify or explain, and (b) successfully predict phenomena. Standard empiricism (the philosophy of science associated with knowledge-inquiry), by contrast, cannot do justice to this aspect of science. It holds that theories are to be assessed on the basis of empirical success and failure, no permanent assumption being made about the universe. As a result, standard empiricism cannot do justice to the way science persistently chooses theories that explain and enable us to understand, for to do so would be to acknowledge that science does make a persistent assumption about the universe, namely, that it is comprehensible, which clashes with the basic tenet of standard empiricism. As a result, "explanation", within standard empiricism, tends to mean no more than "prediction of a wide range of phenomena", which is, of course, a part, but only a part, of what scientific explanation amounts to. The result is that there is always the danger that *science itself* will come to neglect the search for understanding, and will settle for the less demanding goal of merely predicting more and more phenomena more and more accurately.[31] Orthodox quantum theory (OQT) provides an example. Granted aim-oriented empiricism, OQT is unacceptable. OQT predicts a wealth of phenomena, but fails to solve basic problems of understanding, such as what sort of entity an electron is, and whether quantum phenomena are probabilistic or deterministic in character. Granted standard empiricism, however, OQT is eminently acceptable. For decades, the majority of physicists accepted OQT and thereby abandoned the search for understanding. The cultural value of science was, as a result, seriously compromised.[32]

8. THE INTELLECTUAL REVOLUTION REQUIRED TO CREATE THE LOVE OF WISDOM

So far I have argued that academic inquiry, as it exists at present, devoted primarily to the pursuit of knowledge, is grossly and damagingly irrational when judged from the standpoint of helping us learn how to make progress toward a wise world. If we are to create a wiser world, one major step that we

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[31] A major concern of my *The Comprehensibility of the Universe* is to resurrect natural philosophy, the effort to understand the universe in a way that involves a synthesis of science, philosophy, metaphysics, epistemology, and methodology.

[32] See *The Comprehensibility of the Universe*, chapter 7, for details.

need to take is to bring about a major revolution in the aims and methods of academic inquiry, so that it becomes rationally designed to help us acquire wisdom.

What are the changes that need to be made to academic inquiry, and how would making these changes help with the task of creating a better world? These are the questions I now, briefly, answer. The changes I indicate are not arbitrary; they all arise from the simple demand that academic inquiry should put problem-solving and aim-oriented rationality into practice in seeking to help humanity become wiser.

1. There needs to be a change in the basic intellectual *aim* of inquiry, from the growth of knowledge to the growth of wisdom—wisdom being taken to be the capacity to realize what is of value in life, for oneself and others, and thus including knowledge, understanding, and technological know-how.

2. There needs to be a change in the nature of academic *problems*—so that problems of living are included, as well as problems of knowledge.

3. There needs to be a change in the nature of academic *ideas*, so that proposals for action are included as well as claims to knowledge.

4. There needs to be a change in what constitutes intellectual *progress*, so that progress-in-ideas-relevant-to-achieving-a-more-civilized-world is included as well as progress in knowledge.

5. There needs to be a change in the idea as to where inquiry, at its most fundamental, is located. It is not esoteric theoretical physics, but rather the thinking we engage in as we seek to achieve what is of value in life.

6. There needs to be a dramatic change in the nature of social inquiry. Economics, politics, sociology, and so on, are not, fundamentally, *sciences*, and do not, fundamentally, have the task of improving knowledge about social phenomena. Instead, their task is threefold. First, it is to articulate problems of living, and propose and critically assess possible solutions, possible actions or policies, from the standpoint of their capacity, if implemented, to promote wiser ways of living. Second, it is to promote such cooperatively rational tackling of problems of living throughout the social world. And third, at a more basic and long-term level, it is to help build the hierarchical structure of aims and methods of aim-oriented rationality into personal, institutional, and global life, thus creating frameworks within which progressive improvement of personal and social life aims and methods becomes possible.

7. Natural science needs to change, so that it includes at least three levels of discussion: evidence, theory, and research aims. Discussion of aims needs to bring together scientific, metaphysical, and evaluative consid-

erations in an attempt to discover the most desirable and realizable research aims.

8. There needs to be a dramatic change in the relationship between social inquiry and natural science, so that social inquiry becomes intellectually more fundamental from the standpoint of tackling problems of living, promoting wisdom.

9. The way in which academic inquiry as a whole is related to the rest of the human world needs to change dramatically. Instead of being intellectually dissociated from the rest of society, academic inquiry needs to be communicating with, learning from, teaching, and arguing with the rest of society—in such a way as to promote cooperative rationality and social wisdom. Academia needs to have just sufficient power to retain its independence from the pressures of government, industry, the military, and public opinion, but no more. Academia becomes a kind of civil service for the public, doing openly and independently what actual civil services are supposed to do in secret for governments.

10. There needs to be a change in the role that political and religious ideas, works of art, expressions of feelings, desires, and values have within rational inquiry. Instead of being excluded, they need to be explicitly included and critically assessed, as possible indications and revelations of what is of value, and as unmasking of fraudulent values in satire and parody, vital ingredients of wisdom.

11. There need to be changes in education so that, for example, seminars devoted to the cooperative, imaginative, and critical discussion of problems of living are at the heart of all education from five-year-olds onwards. Politics, which cannot be taught by knowledge-inquiry, becomes central to wisdom-inquiry, political creeds and actions being subjected to imaginative and critical scrutiny.

12. There need to be changes in the aims, priorities and character of pure science and scholarship, so that it is the curiosity, the seeing and searching, the knowing and understanding of individual persons that ultimately matters, the more impersonal, esoteric, purely intellectual aspects of science and scholarship being means to this end. Social inquiry needs to give intellectual priority to helping empathic understanding between people to flourish.

13. There need to be changes in the way mathematics is understood, pursued, and taught. Mathematics is not a branch of knowledge at all. Rather, it is concerned to explore problematic *possibilities*, and to develop, systematize and unify problem-solving methods.

14. Literature needs to be put close to the heart of rational inquiry, in that it explores imaginatively our most profound problems of living and aids personalistic understanding in life by enhancing our ability to enter imaginatively into the problems and lives of others.

15. Philosophy needs to change so that it ceases to be just another specialized discipline and becomes instead that aspect of inquiry as a whole that is concerned with our most general and fundamental problems—those problems that cut across all disciplinary boundaries. Philosophy needs to become again what it was for Socrates: the attempt to devote reason to the growth of wisdom in life.[33]

This is the revolution we need to bring about in our traditions and institutions of learning, if we are to create the love of wisdom, and if we are to learn how to make progress toward a wiser world.

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[33] For further discussion of the revolution in academic aims and methods that I am advocating here, see my *From Knowledge to Wisdom*, and *Is Science Neurotic?*.