



How Universities Have Betrayed Reason and Humanity—And What's to Be Done About It

Nicholas Maxwell*

Science and Technology Studies, University College London, London, United Kingdom

OPEN ACCESS

Edited by:

Stephen Sterling,
University of Plymouth,
United Kingdom

Reviewed by:

Ioan Fazey,
University of York, United Kingdom
Peeter Müürsepp,
Tallinn University of
Technology, Estonia

*Correspondence:

Nicholas Maxwell
nicholas.maxwell@ucl.ac.uk

Specialty section:

This article was submitted to
Sustainable Organizations,
a section of the journal
Frontiers in Sustainability

Received: 24 November 2020

Accepted: 11 March 2021

Published: 12 April 2021

Citation:

Maxwell N (2021) How Universities
Have Betrayed Reason and
Humanity—And What's to Be Done
About It. *Front. Sustain.* 2:631631.
doi: 10.3389/frsus.2021.631631

In 1984 the author published *From Knowledge to Wisdom*, a book that argues that a revolution in academia is urgently needed, so that problems of living, including global problems, are put at the heart of the enterprise, and the basic aim becomes to seek and promote wisdom, and not just acquire knowledge. Every discipline and aspect of academia needs to change, and the whole way in which academia is related to the rest of the social world. Universities devoted to the pursuit of knowledge and technological know-how betray reason and, as a result, betray humanity. As a result of becoming more intellectually rigorous, academic inquiry becomes of far greater benefit to humanity. If the revolution argued for all those years ago had been taken up and put into academic practice, we might now live in a much more hopeful world than the one that confronts us. Humanity might have begun to learn how to solve global problems; the Amazon rain forests might not face destruction; we might not be faced with mass extinction of species; Brexit might not have been voted for in the UK in 2016, and Trump might not have been elected President in the USA. An account is given of work published by the author during the years 1972–2021 that expounds and develops the argument. The conclusion is that we urgently need to create a high-profile campaign devoted to transforming universities in the way required so that humanity may learn how to make social progress toward a better, wiser, more civilized, enlightened world.

Keywords: knowledge, wisdom, enlightenment, reason, scientific progress, social progress, academic revolution

THE BETRAYAL

Decades ago, in the George Orwell year of 1984, I published a book called *From Knowledge to Wisdom*¹. In the book I argued that, in order to solve the grave global problems that threaten our future, we need to bring about a revolution in universities, affecting to a greater or lesser extent every discipline and every aspect of the University. Instead of giving priority to solving problems of knowledge, universities need to give priority to problems of living—to the problems we encounter in our lives, from the personal to the global.

¹Maxwell (1984), available free online at <https://philpapers.org/archive/MAXFKT-3.pdf> An original chapter 2 of the book got to be too long; it was published separately as Maxwell (1980), and republished as chapter 9 of Maxwell (2017c). It develops an argument that runs in parallel to that of *From Knowledge to Wisdom*--an argument that is picked up again in Maxwell (2020). Among other things, it puts forward the solution to the problem of rampant specialization. There is more about my work on my website: <https://www.ucl.ac.uk/from-knowledge-to-wisdom/>.

The basic task of the University needs to be to put forward and critically assess possible solutions to our problems of living, possible *actions*, policies, political programmes, ways of living, philosophies of life. A basic task needs to be intelligently conducted public education about what our problems are and what we need to do about them. The University needs to devote itself to helping people achieve what is genuinely of value in life. The pursuit of knowledge and technological know-how is, of course, vital, but it needs to be conducted as a secondary matter, not the primary pursuit of the University.

From Knowledge to Wisdom was widely and favorably reviewed at the time. It received a glowing review in *Nature* by Christopher Longuet-Higgins,² and another by Mary Midgley in the *University Quarterly* (Midgley, 1986). The book went into paperback twice. And then went out of print and was forgotten.

If what I argued for, in 1984, had been taken up and put into academic practice in ensuing years, we might now live in a very different world from the one we find ourselves in. We might have come to grips with global warming long ago, and might not now face the appalling climate crisis that menaces our future. Much more might have been done to rid the world of nuclear weapons. The Amazon rain forests might not face destruction. We might not be faced with mass extinction of species. The oceans might not be full of plastic. The internet might not have been allowed to corrupt democracy and public life. Brexit might not have been voted for in the UK in 2016, and Trump might not have been elected President in the USA. Many more nations might have dealt with the coronavirus pandemic swiftly and competently, thus preventing hundreds of thousands of deaths. It is my personal view that we would now live in a much saner and more hopeful world.

What gives me such confidence that my 1984 book would have had such an astonishing impact if taken up and put into practice? It is this. If what I argued for had been put into practice, all those years ago, universities would have been actively and energetically engaged in helping people resolve conflicts and problems of living in increasingly cooperatively rational ways. All those who now seek knowledge in the social sciences and humanities would have acted very differently; they would have gone out into the community to do what they could to spread social awareness about what our problems are, and what we need to do about them. Peoples' Councils would have been formed, up and down the land, all around the world, devoted to working out what needs to be done to resolve local and global problems—what governments need to do to enable populations to resolve such problems, and what needs to be done to get governments so to act. Rapid population growth, destruction of natural habitats, loss of wild life and mass extinction of species, war and the threat of war, the menace of nuclear weapons, vast inequalities of wealth and power around the world, pollution of earth, air and sea, threats to democracy from social media, and perhaps most serious of all, global warming: what to do to resolve these global

problems would have received sustained public discussion and attention³.

If, during the past 30 years or so, our institutions of learning, our schools and universities, had been actively and energetically engaged in promoting public learning about such problems as these, and what to do about them—actively and energetically engaged in promoting public action to help resolve these problems—we have every reason to suppose that this would have had an impact—although how big an impact may be open to question. Many people, many communities, would have learnt about what our problems are, what needs to be done to solve them, and would have *acted* to help bring solutions about⁴.

But universities have done none of this. They have, as I have said, devoted themselves to the pursuit of specialized knowledge and technological know-how. Universities have been dominated by the idea: the primary task is to acquire knowledge; once acquired, it can then be applied to help solve social problems. Even those working in fields of social science and the humanities believe they should restrict themselves to such an approach. It is not the proper job of the Professor to go out into the community and stir up political activism!

Thus, for the last 30 years universities have singularly failed to engage in public education about what our problems are, and what we need to do about them, so as to make progress toward a better world. Universities have not even remotely conceived of their task in such terms. And as a result, not surprisingly, humanity has shown few signs of learning how to cope better with the grave global problems that confront us. It is hardly too much to say that Extinction Rebellion and Greta Thunberg have done more in 1 year to bring the climate crisis to public attention than all the universities of the world have done in 60 years—ever since we first really knew that global warming would occur.

The central argument of *From Knowledge to Wisdom* is, I must stress, an *intellectual* argument, concerning the intellectual dimension of science, and of academic inquiry more generally. It concerns reason, intellectual integrity, intellectual aims and methods, intellectual values. Academia devoted to the pursuit of knowledge represents a monumental *intellectual blunder*, when judged from the standpoint of helping to promote human welfare. Both aspects of inquiry suffer from this blunder, inquiry pursued for its own sake, and for the sake of other, practical ends. It is that intellectual blunder that we need to identify, and put right, if we are to have what we so urgently need: a kind of academic enterprise rationally devoted to helping us solve problems of living, from the local to the global, so that we may make progress to a better, more civilized, more enlightened world.

“Our planet earth carries all too heavy a burden of killing, torture, enslavement, poverty, suffering, peril and death.”

³For my most up-to-date discussion of the multitude of ways in which the University I argue for would have an impact on public understanding of what our problems are, and what we need to do about them, see Maxwell (2021, chs. 4–7). For my discussion of this issue in 1984 see Maxwell (1984, ch. 7).

⁴That the way the University interacts with the social world is transformed, given the kind of academic inquiry I argue for, is a basic theme of Maxwell (1984). See especially chapter 7, which concludes with a brief account of the cooperative movement in Mondragon, Spain.

²Longuet-Higgins (1984): see <https://www.ucl.ac.uk/from-knowledge-to-wisdom/reviews#goodness>.

That is the first sentence of the book. The rest of the book spells out how natural science, and academic inquiry more generally, have to change, and why, if they are to help prevent avoidable suffering and death, help what is genuinely of value in life to flourish, in the best possible way, by intellectual, technological and educational means. I develop the argument by considering two conceptions and kinds of academic inquiry which I have subsequently come to call *knowledge-inquiry* and *wisdom-inquiry*⁵. Both hold that the basic social or humanitarian aim of inquiry is to help promote human welfare. But the *intellectual* aims and methods of the two conceptions of inquiry are very different. Each has a conception of science associated with it: *standard empiricism* and *aim-oriented empiricism*, respectively.

Knowledge-inquiry is what dominates universities today. It is, I argue, profoundly irrational, in a wholesale, structural way, when judged from the standpoint of helping to promote human welfare. It is this institutional, structural irrationality that is responsible for the failure of knowledge-inquiry to help humanity learn how to solve problems of living so as to promote human welfare. *Knowledge-inquiry betrays reason and, as a result, betrays humanity.*

Wisdom-inquiry is what emerges when knowledge-inquiry is modified just sufficiently to cure it of its gross irrationality. According to wisdom-inquiry, the basic aim of inquiry is wisdom, construed to be the capacity, the active endeavor, and possibly the desire, to realize what is of value in life, for oneself and others. Realize, here, means both apprehend or experience, and create or make real; both aspects of inquiry are included, inquiry pursued for its own sake, and inquiry pursued for the sake of other ends. Wisdom includes knowledge, understanding and technological know-how, but much else besides, such as the capacity to discover what is of value, and the capacity to solve those problems that need to be solved if what is of value is to be realized.

In my work, I should mention, I referred to and discussed the work of many others critical of modern science, of modern academia more generally, or who dealt with the issues that were of concern to me. Thus, in *From Knowledge to Wisdom* I referred to or discussed, often sympathetically, the work of Popper (1959, 1962, 1963), Carson (1972), Commoner (1966), Ellul (1964), Allen (1980), Eckholm (1982), Foley (1981), Maddox (1972), Barzun (1964), Roszak (1969, 1970), Dubos and Ward (1972), Meadows et al. (1974), Goldsmith et al. (1972), Allaby (1977), Schumacher (1973), Heilbroner (1975), Higgins (1978), Easlea (1973), Lakatos (1970), Kuhn (1962), Berlin (1979), Ravetz (1971), Greenberg (1971), Feyerabend (1965), Brandt (1980), Gay (1973), Jungk (1960), George (1976), Dickson (1974), Pirsig (1974), Calder (1981), Midgley (1978), Habermas (1972), Collingridge (1981), Norman (1981), Passmore (1978), Rotblat (1983), Schell (1982), Snow (1964), Wootton (1950), and many, many others. Many of these authors argued, in one way or another, that the modern world was heading toward disaster, and there was an urgent need for radical change. I saw my work as making an important contribution to this view. None however

argued for aim-oriented empiricism or wisdom-inquiry. None even criticized science and the academic enterprise in quite the way I did. A few years after the publication of my book, an academic dispute broke out between those who attacked, and those who defended, scientific rationality, provoked in part by Sokal's (1996) spoof article published in a journal called *Social Text*⁶. But both parties to this dispute missed the crucial point. Scientific rationality, attacked by some, defended by others, was not authentic scientific rationality at all; it was, and is, a characteristic kind of *irrationality* masquerading as rationality—a point I made in the second edition of *From Knowledge to Wisdom*⁷. I argued for *enhanced scientific rationality*, the need for which was overlooked by both parties in the “Science Wars” dispute, and by many others too. It is still overlooked today⁸.

MY CAMPAIGN FOR WISDOM-INQUIRY FROM 1972 TO 2020

My campaign for wisdom-inquiry emerged from a critical look at Karl Popper's philosophy of science in 1972 (Maxwell, 1972). Popper famously argued that science makes progress by means of a process of conjecture and refutation (Popper, 1959, 1963). Popper then generalized this idea: whatever we are doing, progress can be achieved, problems can be solved, by means of conjecture and *criticism* (Popper, 1959, p. 44, n.*1). Popper then applied this idea of *critical rationalism* to social and political issues in his great work *The Open Society and Its Enemies* (Popper, 1962).

It dawned on me that Popper's philosophy of science is untenable. Physicists only ever accept unified theories, even though infinitely many empirically more successful disunified rivals always exist. That means physics makes a big, implicit, metaphysical assumption about the nature of the universe: it is such that some kind of unified pattern of physical law runs through all phenomena. But this assumption is profoundly problematic: it needs sustained criticism, as an integral part of science, in an attempt to improve it. We need, I realized, a new conception of science—*aim-oriented empiricism*—that acknowledges this assumption and seeks to improve it as science proceeds (Maxwell, 1974).

Then, treading a path parallel to Popper's, I generalized my new conception of scientific method to form a new conception of rationality—*aim-oriented rationality*. Whenever we pursue a worthwhile but problematic aim, as very often we do, we need actively to try to improve our aim as we act, as we live. Aim-oriented rationality helps us to do just that.

From these considerations, the basic idea of *From Knowledge to Wisdom* emerged. It was first expressed in *What's Wrong With Science: Toward a People's Rational Science of Delight and*

⁵In my 1984 book I called them *the philosophy of knowledge* and *the philosophy of wisdom*.

⁶For an account of this dispute, the so-called “Science Wars”, see Maxwell (1984, 2nd ed., 2007, pp. 40–46, 141–3); Koertge (1998); Segerstråle (2000).

⁷Maxwell (1984, 2nd ed., 2007, p. 143).

⁸Alan Sokal, however, went on to endorse aim-oriented empiricism. He declared “Maxwell's aim-oriented empiricism is in my opinion a very significant contribution to the philosophy of science”: see <https://www.paragonhouse.com/xcart/Understanding-Scientific-Progress-Aim-Oriented-Empiricism.html>.

Compassion, published in 1976 (Maxwell, 1976). Most of this book consists of a furious argument between a scientist and a philosopher about the issues I have indicated. It was written in 3 weeks, to meet a deadline. I had high hopes for the book, but “it fell dead-born from the press.” I struggled to find a publisher for another book. Blackwell expressed interest, I worked hard on *From Knowledge to Wisdom* for 3 years, and it was published in 1984.

After its publication, and its glowing reception in reviews—despite some criticism from philosophers⁹—I hoped that what I was arguing for would gradually be taken up by the academic enterprise and put into academic practice. This did not happen—and has still not happened. During this period from 1976 to 2020, academia has changed in many ways. Some of the changes can be interpreted as small steps toward wisdom-inquiry; but others have been dramatically in the opposite direction¹⁰. Unrelenting specialization has grown and grown in science, and in academic inquiry more generally. Money, funds for research, has become more and more important, so that what comes to matter most, it almost seems, is the money you bring into the University, not the quality of your research. There has been a considerable loss of intellectual freedom, in the UK at least, so that an academic can no longer pursue an obscure research issue without a successful outcome for years, and survive—something that was once possible. Even when changes stem from the kind of concern behind wisdom-inquiry, nevertheless they fail to achieve what is hoped-for because they are enmeshed in the constraints of knowledge-inquiry. Thus, the emphasis on “impact” may come from the concern that research should be of human value, but *impact per se* does not mean that the impact is of value, and the demand that research should have impact tends to disqualify research of great potential, long-term value, of one kind or another, that has no immediate impact whatsoever. Nevertheless, during the period in question, some changes have taken place that have been genuinely of value. Thus, at my own University, UCL, David Price, vice-Provost for research, introduced the Grand Challenges Programme: this seeks to bring specialists together to tackle global problems—and there is even an input from my work. But it is not wisdom-inquiry.¹¹

Once *From Knowledge to Wisdom* went out of print, at some time in the early 1990s, I realized I had a struggle on my hands to try to put the call for an academic revolution into the public domain. During the period 1976–2020, I published 14 books and 160 articles¹² all devoted, in one way or another, to arguing for the urgent need to bring about a revolution in universities to help save humanity from disaster. During this period I also gave countless lectures on this theme, at universities and conferences

all over the UK, Europe, north America, and even as far afield as Taiwan. I took part in “Start the Week” on Radio 4. On another occasion I gave a talk up a tree (at The Treehouse Gallery) in Regent’s Park in London. In 2003 I started up an emailing group called *Friends of Wisdom*, devoted to the idea that universities should seek and promote wisdom, and not just acquire knowledge.¹³ Today (August 2020), this group consists of 361 scientists, scholars and educationalists scattered around the world. Some are engaged in promoting projects related to the one I have described here.

I gained no academic credit for the work I undertook. In fact, in 1993 my Department accused me of not teaching the philosophy of science because I considered, in my teaching, not just the intellectual aims of science, but the social or humanitarian aims as well, and the humanitarian aims, not just of science, but of the whole academic enterprise. For 20 years or so, I had been way ahead of my contemporaries in what I was teaching, and I was still ahead. I went to see UCL’s Provost to complain about my treatment. “Well, your work does seem to have been moving in new directions,” he said. “Oh, so Universities in Britain have sunk so low one is now penalized for originality,” I replied. He said my work would be investigated. It was, and on the strength of it, a long-delayed promotion to Reader came through. But the harassment in my Department continued, I knew I would not be able to work in such a poisonous atmosphere, and so I decided to take early retirement in 1994, to carry on my work. I mention all this to highlight that originality is still frowned on in academia. A price has to be paid if you seek to upturn the applecart.¹⁴

The 12 books that I have published since 1984 have, in the main, developed themes briefly sketched in *From Knowledge to Wisdom*. In *The Comprehensibility of the Universe: A New Conception of Science*, 1998, I spell out the argument for aim-oriented empiricism—for holding that we should see science as having already established that the universe is physically comprehensible (insofar as science can ever establish anything theoretical) (Maxwell, 1998). I spell out in detail how this view solves major problems in the philosophy of science, including the problem of induction. This book, published by OUP, received a number of excellent reviews, but then was ignored. Alan Sokal expressed his agreement with the basic thesis.

In *the Human World in the Physical Universe: Consciousness, Free Will and Evolution*, 2001, I tackled the fundamental problem: How can our human world, imbued with the experiential, consciousness, free will, meaning and value exist in the physical universe? (Maxwell, 2001). The argument of *From Knowledge to Wisdom* brings this problem sharply into focus: it is tackled in chapter 9 of the book. The basic task of wisdom-inquiry is to help people realize what is genuinely of value in life. But a key step in the argument for wisdom-inquiry is the adoption of the progress-achieving methods of aim-oriented empiricism,

⁹Some philosophers criticized me for defending doctrines that I explicitly criticized in the book.

¹⁰For discussion of the question of the extent to which academia, over the years, has moved toward, and has moved away from, wisdom-inquiry, see Maxwell (1984, 2nd ed., 2007, chs. 6, 11, and 12; 2014a, ch. 4; 2019a, ch. 6).

¹¹For UCL’s Grand Challenges see <https://www.ucl.ac.uk/grand-challenges/>.

¹²For thirteen articles that summarize the from-knowledge-to-wisdom argument in different ways, published across the decades, see Maxwell (1991, 1992, 2000, 2005, 2007, 2008, 2009, 2012, 2013, 2016, 2017d, 2019c,d). Any one of these articles gives a lucid outline of the basic argument. They are all available free online.

¹³See <https://www.ucl.ac.uk/friends-of-wisdom/>.

¹⁴My departure from UCL was unfortunate, but I must add that, before that, I spent nearly 30 wonderful years at UCL, free to do the teaching and research I wanted to do, in the way I wanted to do it. I formed many intellectual friendships. UCL gave me the opportunity and freedom to pursue my research and develop my ideas.

which require us to appreciate that physics presupposes that the universe is physically comprehensible. Thus, we have the problem: How can there be life of value embedded in a physically comprehensible universe? This book received some good reviews, one or two rather supercilious ones from philosophers, and then was forgotten¹⁵.

Then, in 2004, I published *Is Science Neurotic?* (Maxwell, 2004). This book expands brief remarks about Freud and psychoanalytic theory to be found in *From Knowledge to Wisdom*. There I point out that psychoanalytic theory, in line with what I say about social science more generally, should be interpreted as *methodology*—the methodology of aim-pursuing things, whether persons, animals, robots or institutions, sufficiently sophisticated to represent, and so misrepresent, the aims they pursue. Aims are likely to be misrepresented when they are problematic. The more “rationally” one pursues one’s misrepresented aim, the worse off one is from the standpoint of achieving one’s real aim, and the worse off from the standpoint of solving the problems associated with one’s real aim. This pattern of methodological confusion—the methodological counterpoint of psychoanalytic repression and rationalization—I called *rationalistic neurosis*. Psychoanalytic theory is enormously increased in intellectual power and scope as a result of being reinterpreted methodologically, in the way I have just indicated. First, instead of psychoanalytic theory failing to meet the high intellectual standards of science, it is all the other way round; natural science fails to meet the high intellectual standards of methodologically interpreted psychoanalytic theory. Second, the methodological version of psychoanalytic theory applies, not only to individual people, but to institutions, to groups of people, to movements, to animals, and to robots! (Maxwell, 1984, pp. 110–7).

In *Is Science Neurotic?*, I pointed out that science suffers from rationalistic neurosis in that it misrepresents its aim to be truth, when its real aim is the profoundly problematic one of truth *presupposed to be unified or explanatory* or, more generally, truth *that is of value*, and furthermore truth *to be used by people, ideally to enhance what is of value in life*. More generally still, the whole academic enterprise suffers from rationalistic neurosis. Both science, and academic inquiry more generally, need to throw off their rationalistic neurosis, acknowledge real, problematic aims, and seek to realize them in the best possible way by putting aim-oriented empiricism, aim-oriented rationality and wisdom-inquiry into practice.

In 2008 I edited and contributed to *Wisdom in the University* (Barnett and Maxwell, 2008) with Ronald Barnett, a prolific author on Higher Education at the London Institute of Education. This was a collection of essays devoted to wisdom-inquiry themes.

In 2009, Leemon McHenry edited and published *Science and the Pursuit of Wisdom: Studies in the Philosophy of Nicholas Maxwell* (McHenry, 2009). I opened with an account of my work; then a number of authors discussed various aspects of issues around wisdom-inquiry, and the book closes with my responses.

In 2010 I published *Cutting God in Half—And Putting the Pieces Together Again* (Maxwell, 2010), a book that develops what might be called the religious dimension of wisdom-inquiry. The traditional notion of God is not without value; it suggests, for example, that there is one explanation for everything that occurs—the will of God. However, the idea that God exists and is all-powerful, all-knowing, and all-loving, the source of all value, faces a devastating objection: such a God would be knowingly responsible for all human suffering and death brought about by natural causes. Such a God would be a monster, far worse than our petty human monsters such as Hitler or Stalin. How can the concept of God be improved, so that as much as possible of what is of value in the traditional notion is preserved, but this dreadful problem is overcome? The answer is to cut God in half, severe the God-of-Cosmic-Power from the God-of-Cosmic-Value. The first is Einstein’s God, the underlying physical unity inherent in the physical universe. This has some of the attributes of the traditional God: omnipotence, omnipresence, eternal existence. It is however an It. It cannot know what It does, and so can be forgiven the terrible things that It does do. The God-of-Cosmic-Value is what is genuinely of value associated with our human world, or the world of sentient life more generally.

Having cut God in half in this way, the problem then becomes: How can the two halves be put together again? How can the God-of-Value exist in the God-of-Power? How can our human world of value exist and best flourish embedded as it is in the physical universe? As a result of improving our conception of God a bit, we are brought face to face with the fundamental problem in life—our fundamental religious problem, properly conceived. The basic task of wisdom-inquiry is to help us improve the answers we give to this problem in our lives, as we live—a religious problem.

Despite publication of this work, my argument for wisdom-inquiry continued to be ignored, both by most of my philosophy colleagues, and by the academic enterprise as a whole. In 2014 I published another exposition of the argument in a short, accessible book called *How Universities Can Help Create a Wiser World: The Urgent Need for an Academic Revolution* (Maxwell, 2014a). I placed great stress on how urgent it is to put a stop to global warming. It was published as an inexpensive paperback. It received some good reviews, and was then ignored. Later the same year I published *Global Philosophy: What Philosophy Ought to Be* (Maxwell, 2014b), a collection of essays on education for a wiser world; that suffered the same fate.

I decided, next, to return to another theme of *From Knowledge to Wisdom*, namely that putting aim-oriented empiricism into scientific practice would have the consequence that science would be transformed into natural philosophy, a synthesis of science on the one hand, and metaphysics, methodology, philosophy, and epistemology on the other hand. This is one of the themes of chapter 9 of my 1984 book, the subtitle of which is “From Science to Natural Philosophy.”

I began to write *In Praise of Natural Philosophy: A Revolution for Thought and Life* (Maxwell, 2017a). I would begin with the crucial point that science had begun as natural philosophy, in the hands of Kepler, Galileo and others, an admixture of science and metaphysics, but had then been destroyed by Isaac

¹⁵For reviews of my books see <https://www.ucl.ac.uk/from-knowledge-to-wisdom/reviews>.

Newton who, in his *Principia*, asserted firmly: “whatever is not deduced from the phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical... have no place in experimental philosophy. In this philosophy, particular propositions are inferred from the phenomena, and afterwards rendered general by induction. Thus, it was that... the laws of motion and of gravitation were discovered” (Newton, 1962, p. 547). Thus, was modern science born. But this was the third edition of Newton’s great work. As I explored further, I discovered that the first edition was quite different. In that edition there were nine hypotheses, all labeled hypotheses, some clearly of a metaphysical character. The first edition of the *Principia* is quite clearly a great work of natural philosophy, even if Newton did not agree with the metaphysical outlook of Kepler or Galileo. This edition was criticized for its hypothetical character. Newton hated criticism. He set to work to doctor the *Principia* to conceal its conjectural, natural philosophy character. In subsequent editions, the first two hypotheses became two *rules of reasoning*, the last five became five *phenomena*, one disappeared altogether, and the other one was tucked away among the theorems. And Newton added statements banning hypotheses from natural philosophy and extolling the virtues of induction. And because of Newton’s immense prestige, those who came after him believed him, and sought to do science in the way Newton had advocated. Natural philosophy (which gave birth to Newtonian science) was destroyed, and standard empiricist science was born because Newton, disreputably, sought to conceal the vulnerable, conjectural character of his great work. The argument for creating a modern version of natural philosophy within the framework of aim-oriented empiricism seemed to me to be overwhelming—a first step toward wisdom-inquiry. I spelled it all out in the book. In particular, in chapter 5, I spelled out the consequences of aim-oriented empiricism for physics—for its history, for the discovery, interpretation and assessment of physical theory, including quantum theory.

While *In Praise* sought a publisher, I began another book out of an impulse of sheer delight in the interplay of ideas. This book almost wrote itself. It became *Understanding Scientific Progress* (Maxwell, 2017b). In it I demonstrated that aim-oriented empiricism solves all the fundamental problems in the philosophy of science: the problem of induction; the problem of underdetermination; the problem of verisimilitude; two problems of theory unity; the problem of the nature of the progress-achieving methods of science, and their justification; the problem of rational discovery in science. Almost all the problems of the philosophy of science had arisen because philosophers had tried to make sense of science in terms of standard empiricism; abandon the attempt, adopt aim-oriented empiricism instead, and the problems disappear like morning mist. This book provides by far the best formulation of the argument for aim-oriented empiricism that I have produced over the years.

These two books, *In Praise* and *Understanding Scientific Progress*, were published in 2017, as was a third book, *Karl Popper, Science and Enlightenment*, a collection of essays, some never published before, that show how my work grows out of and improves on Popper’s, and that of the Enlightenment. It was

published by my home publisher, UCL Press, and is available free online¹⁶.

In 2019 I published two more books: *Science and Enlightenment: Two Great Problems of Learning* (Maxwell, 2019a), and *The Metaphysics of Science and Aim-Oriented Empiricism: A Revolution for Science and Philosophy* (Maxwell, 2019b). The first of these reformulates the argument of *From Knowledge to Wisdom*. I stress the underlying reason for the crises that we face: we are confronted by two great problems of learning—learning about the universe and ourselves and other living things as a part of the universe, and learning how to become civilized. Our global problems stem from the fact that we have solved the first of these two problems (we did that when we created modern science in the 17th century), but we have not solved the second one. The astonishing success of modern science and technology have led to modern industry, agriculture, transport, power production, hygiene, medicine, and armaments, which have in turn led to much that is good, but also to population growth, habitat destruction, loss of wild life, mass extinction of species, lethal modern war, the menace of nuclear weapons, gross inequalities of wealth and power around the planet, pollution of earth, sea and air, and what is perhaps the most serious global problem of all, the climate crisis. In the book I argue that we need to learn from our solution to the first problem how to go about solving the second one. This was the basic, implicit idea of the Enlightenment but, in developing the idea, the *philosophes* blundered. We still have these ancient blunders built into our universities today, and that is why we still fail to solve the second great problem of learning—learning how to become civilized. A striking indication of the current failure even to recognize the blunders we have inherited from the Enlightenment, let alone resolve them, is provided by Steven Pinker’s recent book *Enlightenment NOW* (Pinker, 2018). This reproduces 18th century Enlightenment thought without any awareness of its dangerous and destructive defects.¹⁷ In the book I spell out what needs to be done: on pages 70–73 I list 23 structural changes that need to be made to knowledge-inquiry to turn it into wisdom-inquiry, and on pages 73–77 I compare and contrast the two conceptions and kinds of inquiry, feature by feature.

The second book published in 2019 arose because I discovered a new research industry had emerged in philosophy called “the metaphysics of science,” a spate of books and articles published from around 2007 that entirely ignores what I had done in the field from my earliest publications, in 1966 and 1968 onwards. I wrote a paper pointing this out; it was rejected and rejected. I wrote another; it was rejected and rejected. However, after the third or fourth rejection, the editor of the journal in question, *Synthese*, said he would publish a book on the subject in the *Synthese Library* series, if I cared to write it.

In chapter 1 of the book in question, *The Metaphysics of Science and Aim-Oriented Empiricism*, I give a lucid account of what I had to say about the problem of how our human world can exist and flourish embedded in the physical universe, in three

¹⁶<https://www.uclpress.co.uk/products/88289>.

¹⁷See Maxwell (2018) for a criticism of Pinker’s book along these lines.

papers of 1966 and 1968. The content of these papers had an immense impact on subsequent philosophy, but unfortunately for me, via the later work of others. My original work still remains almost entirely unknown. This was, for me, doubly unfortunate; first because only bits and pieces of what I had to say emerged into mainstream philosophical literature, seriously distorted and degraded; secondly because, when I came to publish the far more important *From Knowledge to Wisdom*, 16 years later, few in the philosophy profession had heard of me, and the book was ignored by philosophers. In chapter 2 I discuss subsequent work in philosophy that echoes bits of my earlier work; in chapter 3 I expound aim-oriented empiricism, and indicate its implications for science and philosophy; in chapter 4 I critically assess work on the metaphysics of science published from 2007 onwards that blandly ignores the revolutionary implications of aim-oriented empiricism for the field; and in chapter 5 I spell out briefly the argument for wisdom-inquiry.

Earlier, in 2017, I again began a writing exploration of a problem out of sheer delight, for my own pleasure, and without a thought of eventual publication. I imagined, for some reason, that I was a fictional character dreamed up by Franz Kafka; I was writing a report to the academy. (Later, when I looked it up, I discovered the ostensible author in Kafka's short story with that title is an ape!) What I was writing led me up the garden path, and it became eventually the text of my latest publication *Our Fundamental Problem: A Revolutionary Approach to Philosophy* (2020) (Maxwell, 2020).

Our fundamental problem can be put like this: How can our human world, the world of experience, consciousness, meaning and value, exist and best flourish embedded as it is in the physical universe? This problem encompasses all other problems of life, science and thought. In the book I argue for, and do, a new kind of philosophy that I call *Critical Fundamentalism*. Its task is to keep alive imaginative and critical—that is rational—thinking about our fundamental problem. Far from this problem being the exclusive province of philosophers, it is all the other way round: a basic professional task of philosophers who pursue Critical Fundamentalism is to encourage everyone to think about the fundamental problem, from time to time. We need to put it at the heart of the University, and at the heart of education. It is especially important that imaginative and critical thought is devoted to interactions, in both directions, between the fundamental problem, and more particular problems of life, science and thought.

Academic philosophy, whether analytic or Continental, is not known for its fruitful implications for fields outside philosophy. In this respect, Critical Rationalism is very different. It has radical implications for physics, for neuroscience, for evolutionary theory, for the nature of the natural sciences, for social science, for the humanities, for academic inquiry as a whole, for the future of the world. I spell out these implications in the book.

A vital step that needs to be taken is to create a Symposium in each University, open to everyone at the University, that meets regularly, and is devoted to sustained exploration of the fundamental problem, and its interactions with the more particular and specialized problems of life, science and thought. Creation of such a Symposium can easily be done. It does not

require that radical structural changes are made to the University. Such a Symposium would however provide an arena within the University where fundamental questions can readily be raised about the purpose of the University, how it can best help humanity solve global problems, make progress toward a better world. The University as it exists at present, composed as it is of multiple specialized disciplines, provides no such arena for discussion of such vital questions. The Symposium might well be a vital stepping stone toward the creation of wisdom-inquiry.

My latest book, *The World Crisis - And What To Do About It* (Maxwell, 2021) gives a detailed, fiercely argued account of how transformed, wisdom-inquiry universities really could solve the world crisis. Everyone should read it!

My argument for wisdom-inquiry has been summarized in different ways many times over the years: any one of the papers referred to in note 12 gives a good account of it. These papers are all available free online, as are my first two books and the one on Popper. It is striking, however, that the 14 books and 160 papers that I have published over the decades, all arguing for the urgent need to transform universities, have had no discernible impact on the academic enterprise whatsoever. Academic resistance to change is deep-rooted.¹⁸

Why is science, and academic inquiry more generally, so resistant even to considering my long-standing argument for the urgent need for radical change? This is a question I have tackled and answered a number of times in my publications.¹⁹ There is, first, what I have called the “lobster pot” effect.²⁰ Standard empiricism, once accepted, banishes criticism of itself from science. According to standard empiricism, an idea, in order to enter into the intellectual domain of science, must be empirically testable. A criticism of standard empiricism is not itself, however, a straightforwardly factual statement that is empirically testable; hence, it has no place in science. It is *philosophy* of science, not science, and thus deserves to be ignored by scientists. And, in line with this, scientists do tend to hold that the philosophy of science has no relevance for science; see my *Understanding Scientific Progress*, page 12, for pretty withering remarks about the sterility and irrelevance of philosophy of science by scientists John Ziman, Steven Weinberg and Stephen Hawking. Unfortunately, these scientists do have a point: most philosophy of science (like the scientific community) takes the untenable doctrine of standard empiricism for granted, and that condemns the discipline to scientific irrelevance and triviality. In order to become fruitful, the philosophy of science needs to adopt and advocate aim-oriented empiricism!²¹

In an analogous way, knowledge-inquiry, once accepted, also protects itself from criticism, although much less effectively. Granted knowledge-inquiry, a contribution to academic thought

¹⁸This resistance is likely to be articulated as a defense of traditional standards of intellectual rigor, but my argument reveals just how untenable such a defense would be: traditional standards of rationality, associated with knowledge-inquiry, are actually characteristic kinds of irrationality that masquerade as reason. It is the irrationality of traditional knowledge-inquiry that is the problem.

¹⁹See especially Maxwell (1984, pp. 27, 122-4, 153-5; 2nd ed., 2007, pp. 37-8, 134-5, 177-9). See also Maxwell (2010, pp. 43-7).

²⁰Maxwell (1976, p. 71). See also pages 70-75.

²¹See especially Maxwell (2017a,b).

must be, in one way or another, a potential contribution to knowledge. A criticism of knowledge-inquiry—a view about what the aims and methods of academic inquiry ought to be—is not even a criticism of a claim to knowledge, and thus has, according to knowledge-inquiry, no right to enter the intellectual domain of academic thought. In practice, however, such criticism does exist—although often quite different from, even the very opposite of, the criticism I have of knowledge-inquiry, the academic status quo.²²

There is another reason why academia is reluctant even to consider the argument I have propounded over the decades for the urgent need for radical change. Standard empiricism and knowledge-inquiry are about matters of vital concern to all scientists, all academics. They specify the requirements a scientific or academic paper must satisfy to be published. All scientists, all academics, passionately want their work to be published, for a variety of motives, from the noble to the less noble. The flourishing, even the existence, of an academic career depends on publication. An argument which implies that requirements for publication need to be transformed is bound to be perceived as a potential threat. If taken seriously, it might mean that contributions to science, to academic thought, highly prized, might be revealed abruptly to be of far less worth. Reputations might tumble. Senior scientists and academics, who have the greatest say over what is, and what is not, taken note of, are likely to be among those who have the most invested in the academic status quo, and who are thus likely to be the most reluctant to countenance the very idea of radical change.

Furthermore, those who govern universities, the deans and vice-chancellors, are even more likely to be opposed to the very idea of transforming universities so that wisdom-inquiry comes to replace knowledge-inquiry. Wisdom-inquiry transforms unacknowledged, implicit political objectives into explicit objectives that may well be at odds with those of the Government: that is likely to incur opposition, if not outrage, from the Government. Those who provide funds for universities—industry, benefactors, the public, students—may object too. Vice-chancellors, sensitive to PR considerations, are unlikely to welcome the idea of radical academic change.

An additional factor is that universities today, pervaded by rampant specialization, provide no arena within which proposals for radical academic change, such as the one I have argued for, can be discussed. Academic philosophy, obsessed with its arcane intellectual puzzles, does not provide such an arena, and the Symposium discussed above does not yet exist. The absence of such an arena within academia means that proposals and arguments such as the one indicated here are just ignored.

And there is another point as well. Despite all their faults, science as it exists today, and academia as it exists today, do provide something of superlative value to humanity: objective, factual knowledge of extraordinary detail and scope, and theories of astonishing explanatory power. Is it really sensible to tamper with long-established methods which enable us to procure these absolutely vital necessities of our modern world, just on the strength of a flimsy philosophical argument that can

hardly be said to be generally endorsed and confirmed by the academic community of philosophers and philosophers of science? Many may well hold that, as things are, it would be absurd and dangerous to take the argument for aim-oriented empiricism and wisdom-inquiry seriously, to the extent of putting the implications of the argument into scientific and academic practice.

I have sympathy for this point of view. But there is no argument here, whatsoever, for *ignoring altogether* the argument for wisdom-inquiry. The world crisis we face, I have argued, has arisen in part because science, and academia more generally, have put into practice a profoundly irrational philosophy of science—a profoundly irrational philosophy of inquiry: standard empiricism and knowledge-inquiry. A vital step toward coming to grips with the world crisis—above all, the climate crisis—is to cure science and academia of their rationality defects; that requires that we put aim-oriented empiricism and wisdom-inquiry into scientific and academic practice. Problems of living need to be given priority over problems of knowledge. The basic academic task needs to become to help humanity get a better understanding of what our problems are, what we need to do about them.

Given the very serious situation that we are in, it is the height of intellectual and moral irresponsibility to just ignore such an argument. It deserves serious attention, discussion and assessment. We do need, unquestionably, to make some changes in the way academia proceeds. Academics, without question, need to become more actively engaged with the public about our problems, and what we need to do about them. The Symposium, already mentioned, really ought to be brought into existence in at least some universities. What kind of inquiry best helps us create a good world?—to echo the title of one of my papers—really ought to be a question seriously discussed and debated within the University. At present it is not.

We urgently need, in my view, to create a high profile campaign to overcome this resistance and bring wisdom-inquiry to our universities. This revolution needs to be brought about by helping the kind of research, public engagement and education we require to grow and flourish.

SUMMARY OF THE ARGUMENT

Humanity is confronted by two great problems of learning: learning about the universe, and about ourselves and other living things as a part of the universe; and learning how to create civilization. We have solved the first problem. We did that in the 17th century when we created modern science and technology. But we have not yet solved the second problem. That combination of solving the first great problem of learning but failing to solve the second one puts us in a situation of great danger. Almost all our current global problems have arisen as a result. For, as a result of solving the first problem, we enormously increase our power to act. Modern science and technology lead to modern industry, modern agriculture, modern power production, modern travel, hygiene, medicine and armaments, and so to much that is of great benefit, but also to global warming, habitat destruction, mass extinction of species, lethal modern

²²See Maxwell (1984, 2nd ed., pp. 40–46).

war, and most of our other current grave global problems. Before the advent of modern science, lack of civilization, lack of wisdom, did not matter too much; we lacked the power to act to do too much damage to ourselves or the planet. Now that we have modern science and technology, and the power to act it bequeaths to us, wisdom has become, not a private luxury but a public necessity. Science without civilization, without wisdom, is a menace.

But how can we acquire wisdom? The historical record is not encouraging. There is, however, a solution. *We can learn from our solution to the first great problem of learning how to solve the second one.* We can learn from scientific progress how to achieve social progress toward a genuinely civilized, wise world.

This is not a new idea. It goes back to the 18th century Enlightenment, especially the French Enlightenment. That was the basic idea of the *philosophes*, Voltaire, Diderot, Condorcet, and the rest: to learn from scientific progress how to achieve social progress toward an enlightened world.

In order to develop and implement this profoundly important idea properly, three crucial steps need to be got right.

- (1) The progress-achieving methods of science need to be got right.
- (2) These methods need to be generalized properly, so that they become fruitfully applicable, potentially, to any problematic, worthwhile endeavor.
- (3) The generalized, progress-achieving methods then need to be got into social life, into government, industry, agriculture, finance, law, the media—so that all these institutions and social endeavors cooperate in contributing toward progress toward an enlightened world.

Unfortunately, the *philosophes* got all three steps wrong. They got the nature of the progress-achieving methods of science wrong; they failed to generalize these methods properly; and most disastrously of all, they applied progress-achieving methods derived from natural science, not directly to social life, but instead to the task of improving *knowledge* of social life, to the task of creating the *social sciences* in other words. If this third step had been got right, social inquiry would have been developed as *social methodology*, devoted to getting progress-achieving methods, derived from those of science, into the fabric of social life, so that social progress can be made toward an enlightened world. But the *philosophes* blundered. They developed social inquiry, not as *social methodology*, but as *social science*.

This trebly botched version of the profound Enlightenment idea was then further developed throughout the 19th century by J.S. Mill, Karl Marx, Max Weber and others, and built into academia in the early 20th century with the creation of academic disciplines and departments of social science: economics, sociology, anthropology, psychology and the rest. The outcome is what we still have today: knowledge-inquiry, academia devoted in the first instance to the pursuit of knowledge. The basic idea is simply this: first, knowledge must be acquired; once acquired, it can be applied to help solve social problems, and thus help promote human welfare.

But, judged from the standpoint of helping to promote human welfare, knowledge-inquiry violates, in a structural way, the two

most elementary rules of rational problem solving conceivable. In order to promote human welfare, the problems we fundamentally need to solve are problems we encounter in life, problems of suffering, injustice, avoidable death. These are problems solved by *action*, by what we *do*, or *refrain* from doing. When knowledge or technological know-how is required, as it is in medicine or agriculture, it is always what this knowledge or technology enables us to *do* that solves the problem, not the knowledge or technology as such. Thus, a kind of inquiry that helps promote human welfare *rationally* would give intellectual priority to the tasks of (a) articulating, and improving the articulation, of the problems of living to be solved, and (b) proposing and critically assessing possible solutions—possible *actions*, *policies*, *political programmes*, *philosophies of life*, *ways of living*. Solving problems of knowledge and technology would be important, but secondary. But knowledge-inquiry, in giving priority to problems of knowledge, violates both (a) and (b). The two most basic rules of reason are violated, in a structural way. And as a result, knowledge-inquiry academia fails to do what it most needs to do to promote human welfare, namely give priority to helping humanity solve problems of living. It fails to help the public improve its understanding of what our problems are, and what we need to do about them. Reason is betrayed, and as a result humanity is betrayed too.

Universities, as they exist today, embody in their structure the profound idea of the Enlightenment: to learn from scientific progress how to achieve social progress toward an enlightened world. Unfortunately, universities also embody the three blunders of the Enlightenment. That is, however, a point of immense significance. It means that, in order to develop a kind of academia rationally and effectively devoted to promoting human welfare, we do not need to grope in the dark, guessing at what needs to change. What we need to do is identify the three mistakes of the Enlightenment, as still built into universities today, correct them, and make the changes to the structure of academic inquiry that that entails.

Here, very briefly, is what needs to be done to correct the three blunders of the Enlightenment.

- (1) The scientific community today takes standard empiricism for granted, the view that the basic aim of science is truth, the basic method being the impartial assessment of laws and theories with respect to evidence. But this view, inherited from Newton and the Enlightenment, is untenable. Physics only ever accepts unified theories even though infinitely many empirically more successful disunified rivals always exist. The aim of physics (and so of natural science) is not truth *per se*, but rather truth *presupposed to be unified*. There are problematic metaphysical assumptions inherent in the aims of science, and problematic value and political assumptions as well. If science is to proceed in such a way as to maximize its chances of success, it needs to adopt and implement a new conception of the progress-achieving methods of science—*aim-oriented empiricism*—which represent the problematic assumptions implicit in the aims of science in the form of a hierarchy of assumptions, these assumptions becoming increasingly insubstantial as one goes up the hierarchy, and so increasingly

likely to be true, and increasingly such that their truth is required for science to be possible at all. In this way, a relatively stable framework of assumptions and associated methods is created, high up in the hierarchy, within which much more substantial assumptions, and associated methods, low down in the hierarchy, and very likely to be false, can be critically assessed, and improved, in the light of which lead to the most empirically successful research programmes. As science advances and improves knowledge, it improves its aims and methods, its knowledge about how to improve knowledge.

- (2) It is not just in science that basic aims are problematic; this is the case in life too. Indeed, most of our global problems have arisen because we have pursued aims that seemed, initially, good and unproblematic, but subsequently turned out to have highly undesirable, unforeseen consequences (such as global warming). Aim-oriented empiricism is not just vital for science; when generalized, it becomes vital for personal and social life too. We need to generalize aim-oriented empiricism to form a conception of rationality—*aim-oriented rationality*—designed to facilitate the improvement of problematic aims whatever we may be doing. According to aim-oriented rationality, whenever aims are problematic, as they often are, we need to represent them in the form of a hierarchy, aims becoming increasingly unspecific and unproblematic as we go up the hierarchy, so that we create a framework of unproblematic aims and methods within which much more specific and problematic aims and methods, low down in the hierarchy, can be improved as we act, as we live.
- (3) The proper task of social inquiry and the humanities is to help humanity resolve conflicts and problems of living, including global problems, in increasingly cooperatively rational ways. It is also the task of social inquiry to help humanity build aim-oriented rationality into the fabric of social life, into all our other institutions and social endeavors besides science, so that we can make use of progress-achieving methods, that enable us to improve problematic aims as we act, that are derived from the progress-achieving methods of science. The hope is that, as a result, we can begin to make social progress toward a civilized, enlightened world with something of the success that science achieves in making progress toward greater knowledge.

REFERENCES

- Allaby, M. (1977). *Inventing Tomorrow*. London: Abacus.
- Allen, R. (1980). *How to Save the World: Strategy for World Conservation*. London: Kogan Page.
- Barnett, R. and N. Maxwell (eds.). (2008). *Wisdom in the University*. London: Routledge.
- Barzun, J. (1964). *Science: The Glorious Entertainment*. London: Seeker and Warburg.
- Berlin, I. (1979). *Against the Current*. London: Hogarth Press.
- Brandt, W., et al. (1980). *North-South: A Programme for Survival*. London: Pan Books.
- Calder, N. (1981). *Nuclear Nightmares*. Harmondsworth: Penguin.
- Carson, R. (1972). *Silent Spring*. Harmondsworth: Penguin.
- Collingridge, D. (1981). *The Social Control of Technology*. Milton Keynes: Open University Press.

As a result of correcting the three blunders built into academia today that we have inherited from the Enlightenment, knowledge-inquiry is transformed into wisdom-inquiry. Almost every discipline and aspect of academia is transformed. The social sciences become social methodologies, actively engaged in helping people resolve conflicts and problems of living in increasingly cooperatively rational ways, and providing the methodological means to do that. Natural science is transformed into natural philosophy, a synthesis of science and metaphysics, science and philosophy. Social inquiry becomes intellectually more fundamental than natural science. The relationship between academia and society is transformed; social inquiry and the humanities do not just study society; they interact with society, promote learning and appropriate action in the social world. Academia becomes a kind of people's civil service, doing openly for the public what actual civil services are supposed to do in secret for governments.

Humanity is in deep trouble, in part because our institutions of learning, our universities, have long been seriously defective intellectually, and thus dysfunctional. Most academics today appreciate just how serious is the plight that we are in, and there is the beginning of an awareness that universities are not doing all that they might do to help put a stop to climate change and the degradation of the natural world. This special issue of *Frontiers* is an indication of the growing awareness among academics that universities need to change. I hope my academic colleagues will burst free of the irrational constraints of knowledge-inquiry, and do all they can to inspire the public to put pressure on governments to *act now* to put a stop to impending disaster.

DATA AVAILABILITY STATEMENT

The original contributions generated for the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

- Commoner, B. (1966). *Science and Survival*. London: Gollancz.
- Dickson, D. (1974). *Alternative Technology*. London: Fontana.
- Dubos, R., and Ward, B. (1972). *Only One Earth*. Harmondsworth: Penguin.
- Easlea, B. (1973). *Liberation and the Aims of Science*. London: Chatto and Windus.
- Eckholm, E. (1982). *Down to Earth: Environment and Human Needs*. London: Pluto Press.
- Ellul, J. (1964). *The Technological Society*. New York, NY: Vintage Books.
- Feyerabend, P. (1965). "Problems of empiricism," in *Beyond the Edge of Certainty*, ed R. Colodny (New York, NY: Prentice-Hall), 145–260.
- Foley, G. (1981). *The Energy Question*. Harmondsworth: Penguin.
- Gay, P. (1973). *The Enlightenment: An Interpretation*. London: Wildwood House.
- George, S. (1976). *How the Other Half Dies*. Harmondsworth: Penguin.
- Goldsmith, E., Allen, R., Davoll, J., Lawrence, S., and Allaby, M. (1972). A blueprint for survival. *Ecology* 2, 1–43.
- Greenberg, D. S. (1971). *The Politics of Pure Science*. New York, NY: New American Library.

- Habermas, J. (1972). *Knowledge and Human Interests*. London: Heinemann.
- Heilbroner, R. (1975). *An Inquiry into the Human Prospect*. London: Calder and Boyars.
- Higgins, R. (1978). *The Seventh Enemy: The Human Factor in the Global Crisis*. London: Hodder and Stoughton.
- Jung, R. (1960). *Brighter than a Thousand Suns*. Harmondsworth: Penguin.
- Koertge, N., (ed.). (1998). *A House Built on Sand: Exposing Postmodernist Myths about Science*. Oxford: Oxford University Press.
- Kuhn, T. S. (1962). *The Structure of Scientific Revolutions*. Chicago, IL: Chicago University Press.
- Lakatos, I. (1970). "Falsification and the methodology of scientific research programmes," in *Criticism and the Growth of Knowledge*, eds Lakatos and Musgrave (Cambridge: Cambridge University Press), 91–195.
- Longuet-Higgins, C. (1984). For goodness sake. *Nature* 312:204. doi: 10.1038/312204a0
- Maddox, J. (1972). *The Doomsday Syndrome*. London: Macmillan.
- Maxwell, N. (1972). A critique of Popper's views on scientific method. *Philos. Sci.* 39, 131–152. doi: 10.1086/288429
- Maxwell, N. (1974). The rationality of scientific discovery. *Philos. Sci.* 41, 123–153. doi: 10.1086/288592
- Maxwell, N. (1976). *What's Wrong With Science? Towards a People's Rational Science of Delight and Compassion*. Hayes: Bran's Head Books.
- Maxwell, N. (1980). Science, reason, knowledge, and wisdom: a critique of specialism. *Inquiry* 23, 19–81. doi: 10.1080/00201748008601891
- Maxwell, N. (1984). *From Knowledge to Wisdom*. Oxford: Blackwell.
- Maxwell, N. (1991). "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 and New York: Walter de Gruyter), 388–427.
- Maxwell, N. (1992). What kind of inquiry can best help us create a good world? *Sci. Technol. Hum. Values* 17, 205–227. doi: 10.1177/016224399201700204
- Maxwell, N. (1998). *The Comprehensibility of the Universe: A New Conception of Science*. Oxford: Oxford University Press.
- Maxwell, N. (2000). Can humanity learn to become civilized? the crisis of science without civilization. *J. Appl. Philos.* 17, 29–44. doi: 10.1111/1468-5930.00138
- Maxwell, N. (2001). *The Human World in the Physical Universe: Consciousness, Free Will, and Evolution*. Lanham: Rowman and Littlefield.
- Maxwell, N. (2004). *Is Science Neurotic?* London: World Scientific.
- Maxwell, N. (2005). A revolution for science and the humanities: from knowledge to wisdom. *Dialogue Univ.* XV, 29–57. doi: 10.5840/du2005151/263
- Maxwell, N. (2007). From knowledge to wisdom: the need for an academic revolution. *Lond. Rev. Educ.* 5, 97–115. doi: 10.1080/14748460701440350
- Maxwell, N. (2008). Are philosophers responsible for global warming? *Philos. Now* 12–13.
- Maxwell, N. (2009). "How can life of value best flourish in the real world?" in *Science and the Pursuit of Wisdom: Studies in the Philosophy of Nicholas Maxwell*, eds Leemon McHenry and Ontos Verlag (Frankfurt: Ontos Verlag), 1–56.
- Maxwell, N. (2010). *Cutting God in Half—And Putting the Pieces Together Again: A New Approach to Philosophy*. London: Pentire Press.
- Maxwell, N. (2012). Arguing for wisdom in the University: an intellectual autobiography. *Philosophia* 40, 663–704. doi: 10.1007/s11406-012-9375-4
- Maxwell, N. (2013). From knowledge to wisdom: assessment and prospects after three decades. *Integr. Rev.* 9, 76–112.
- Maxwell, N. (2014a). *How Universities Can Help Create a Wiser World: The Urgent Need for an Academic Revolution*. Exeter: Imprint Academic.
- Maxwell, N. (2014b). *Global Philosophy: What Philosophy Ought to Be*. Exeter: Imprint Academic.
- Maxwell, N. (2016). "Can scientific method help us create a wiser world?" in *Practical Wisdom in the Age of Technology: Insights, Issues and Questions for a New Millennium*, eds N. Dalal, A. Intezari, and M. Heitz (London: Routledge), 147–161.
- Maxwell, N. (2017a). *In Praise of Natural Philosophy: A Revolution for Thought and Life*. Montreal, QC: McGill-Queen's University Press.
- Maxwell, N. (2017b). *Understanding Scientific Progress: Aim-Oriented Empiricism*. St. Paul, MN: Paragon House.
- Maxwell, N. (2017c). *Karl Popper, Science, and Enlightenment*. London: UCL Press. Available online at: <https://www.uclpress.co.uk/products/88289> (accessed March 23, 2021).
- Maxwell, N. (2017d). Can universities save us from disaster? *Horiz.* 25, 115–130. doi: 10.1108/OTH-04-2016-0019
- Maxwell, N. (2018). We need progress in ideas about how to achieve progress. *Metascience* 27, 347–350. doi: 10.1007/s11016-018-0312-4
- Maxwell, N. (2019a). *Science and Enlightenment: Two Great Problems of Learning*. Cham: Springer. doi: 10.1007/978-3-030-13420-4_3
- Maxwell, N. (2019b). *The Metaphysics of Science and Aim-Oriented Empiricism: A Revolution for Science and Philosophy*. Cham: Synthese Library, Springer.
- Maxwell, N. (2019c). The scandal of the irrationality of academia. *Philos. Theory High. Educ.* 1, 105–128. doi: 10.3726/ptihe.2019.01.06
- Maxwell, N. (2019d). "How wisdom can help solve global problems," in *Applying Wisdom to Contemporary World Problems*, eds R. Sternberg, H. Nusbaum, and J. Glueck (London: Palgrave Macmillan), 337–380.
- Maxwell, N. (2020). *Our Fundamental Problem: A Revolutionary Approach to Philosophy*, Montreal, QC: McGill-Queen's University Press.
- Maxwell, N. (2021). *The World Crisis—And What To Do About It: A Revolution for Thought and Action*. London: World Scientific.
- McHenry, L. (2009). *Science and the Pursuit of Wisdom: Studies in the Philosophy of Nicholas Maxwell*. Frankfurt: Ontos Verlag.
- Meadows, D. H., Meadows, D. L., Randers, J., and Behrens, W. W. III (1974). *The Limits to Growth*. London: Pan Books.
- Midgley, M. (1978). *Beast and Man*. Sussex: Harvester Press.
- Midgley, M. (1986). Is wisdom forgotten? *Univ. Q. Cult. Educ. Soc.* 40, 425–427. doi: 10.1111/j.1468-2273.1986.tb01487.x
- Newton, I. (1962). *Principia*, translated by A. Motte and revised by F. Cajori. Berkeley, CA: University of California Press.
- Norman, C. (1981). *The God that Limp*s. New York, NY: Norton.
- Passmore, J. (1978). *Science and Its Critics*. London: Duckworth.
- Pinker, S. (2018). *Enlightenment NOW*. London: Allen Lane.
- Pirsig, R. (1974). *Zen and the Art of Motorcycle Maintenance*. London: Bodley Head.
- Popper, K. (1959). *The Logic of Scientific Discovery*. London: Hutchinson.
- Popper, K. (1962). *The Open Society and Its Enemies*. London: Routledge and Kegan Paul.
- Popper, K. (1963). *Conjectures and Refutations*. London: Routledge.
- Ravetz, J. R. (1971). *Scientific Knowledge and Its Social Problems*. Oxford: Clarendon Press.
- Rozsak, T. (ed.). (1969). *The Dissenting Academy*. Harmondsworth: Penguin.
- Rozsak, T. (1970). *The Making of a Counter Culture*. London: Faber.
- Rotblat, J. (1983). *Scientists, the Arms Race, and Disarmament*. London: Taylor and Francis.
- Schell, J. (1982). *The Fate of the Earth*. London: Picador.
- Schumacher, E. F. (1973). *Small is Beautiful*. London: Blond and Briggs.
- Seegerstråle, U., (ed.). (2000). *Defenders of the Truth: The Battle for Science in the Sociobiology Debate and Beyond*. Oxford: Oxford University Press.
- Snow, C. P. (1964). *The Two Cultures and a Second Look*. Cambridge: Cambridge University Press.
- Sokal, A. (1996). Transgressing the boundaries: toward a transformative hermeneutics of quantum gravity. *Soc. Text* 46–47, 217–252. doi: 10.2307/466856
- Wootton, B. (1950). *Testament for Social Science*. London: Allen and Unwin.

Conflict of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2021 Maxwell. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.