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How Simple is it for Science to Acquire Wisdom According to its Choicest Aims?

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Abstract Focusing on Nicholas Maxwell's thesis that "science, properly understood, provides us the methodological key to the salvation of humanity", the article discusses Maxwell's aim oriented empiricism and his conception of Wisdom Inquiry as *advocated* in Maxwell's (2009b, pp.1–56) essay entitled "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* 2009, edited by Leemon McHenry) and in Maxwell (2004 & 2009a).

Keywords Rationality of science · Metaphysical assumptions · Aim and methodology of science · Popper, Maxwell and aim oriented empiricism · Aim-oriented rationality, Wisdom inquiry · Global challenges before humanity · The role of values

The Pursuit of Wisdom

Edited by Leemon McHenry, *Science and the Pursuit of Wisdom: Studies in the Philosophy of Nicholas Maxwell* (2009), comprises of essays by distinguished scholars from many fields, viz., cognitive science, sociology, philosophy, law, science studies, philosophy of science and mathematics. In celebration of Nicholas Maxwell's (1976, 1984, 1998, 2004, 2009a, b, c) philosophy, these essays focus on its different aspects, raising many interesting questions and covering a wide range of topics as follows: "Nicholas Maxwell in Context: The Relationship of His Wisdom Theses to the Contemporary Global Interest in Wisdom" by Copthorne Macdonald; "Prolegomena to a Critique of Pure Wisdom" by Steve Fuller; "Why is it So Hard to Move From Knowledge to Wisdom" by John Stewart; "The Urgent Need for an Intellectual Revolution: Maxwell's Version" by Joseph Agassi; "No Easy Answers: Wisdom and Cognitive Science" by Margaret Boden; "How Should Research be

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Organized? An Alternative to the UK Research Assessment Exercise" by Donald Gillies; "Our Place in Nature" by Jeremy Shearmur; "Maxwell on Free Will, Science and Determinism" by Mathew Iredale; "The Limits to Physicalism" by David Hodgson; "Metaphysics and Methodology: Aim-Oriented Empiricism" by Karl Rogers; "Popper and Maxwell on Scientific Progress" by Leemon McHenry.

The essays are structured around three basic themes, viz., (a) science in pursuit of wisdom; (b) human world and the physical universe; and (c) philosophy of science. The detailed discussions of Maxwell's views are followed by his own response entitled "Replies and Reflections". Maxwell's work, in focus here, is known for his formulation and his proposed solution of two fundamental problems, as he himself identifies them (Maxwell 2009b, p.3):

1. "How can we understand our human world, embedded as it is within the physical universe, in such a way that justice is done both to the richness, meaning and value of human life on the one hand, and to what modern science tells us about the physical universe on the other hand?"
2. "What ought to be the overall aims and methods of science, and academic inquiry more generally, granted that the basic task is to help humanity achieve what is of value—a wiser, more civilized world—by cooperatively rational means (it being assumed that knowledge and understanding can be of value in themselves and form part of civilized life)?"

Maxwell (1976, 1984, 1998, 2004, 2009a, b, c) develops aim oriented empiricism (henceforth AOE) as a philosophy of natural science, arguing how to improve its aims and methods. While arguing for AOE, Maxwell (2009b, pp. 24-25, 2004, pp.68–112) also seeks improvement, *first,* on the Enlightenment Programme and, *secondly*, on Karl Popper (1983), particularly on Popper's admirable falsificationist methodology, on his critical rationalism and on his scientific realism, all of which Popper defended in his famous books which he wrote from 1930 s to the end of the last century (Popper 1934, 1963, 1972, 1994). Moving beyond philosophy of science, Maxwell develops his (more general) conception of aim-oriented rationality, arguing that there is a need for an intellectual revolution in academia generally. That is to say, there is a need to move from knowledge to wisdom and from knowledge inquiry (KI) to wisdom inquiry (WI). In order to create a better and more civilized world, argues Maxwell (2009b, p. 25), there is an "urgent need to transform knowledge-inquiry into wisdom-inquiry". It is possible to achieve this by improving the aims of science, making it more rational, responsible and far reaching (Pandit 2007b, 2008, 2009). In what follows, I want to focus on Maxwell's AOE and his conception of wisdom inquiry, taken together with his thesis: That "science, properly understood, provides us the methodological key to the salvation of humanity". The main question here is how far is it possible to implement the idea underlying this thesis and what is really involved in a proper understanding of science, its aims and methods.

Maxwell's AOE and his Conception of Wisdom Inquiry

Seeking to connect the two fundamental problems just alluded to above, Maxwell's (2009b, pp. 1–56) essay entitled "How Can Life of Value Best Flourish in the Real

World?" raises a fundamental question. Like Karl R. Popper, Maxwell's central concern is with the question: What is the rationality of science and what role it can play not only in scientific progress or growth of knowledge but in helping humanity to create a better world in order to improve the human condition on Earth? What are the proper aims and methods of science? However, in asking these questions, his aim is to succeed where Popper may have failed to solve the problem of the rationality of science. Maxwell (2009b, p. 16) argues that "Popper, like almost all scientists and philosophers of science, took it for granted that the basic intellectual aim of science is to acquire knowledge of factual truth, *nothing being persistently presupposed about the truth independently of evidence*. But this seriously misrepresents the real aim of science. Physics persistently only accepts *unified* theories even though endlessly many even more empirically successful *disunified* rivals can always easily be concocted. This means physics makes a persistent metaphysical assumption: the universe is such that no disunified theory is true. Or, in other words: the universe is more or less *physically comprehensible* (only unified theories being explanatory, or depicting a physically comprehensible range of phenomena). The aim of physics is not truth *per se*, but rather truth presupposed to be *physically comprehensible*".

At its very core, AOE is based on the assumption that the aims of science are inherently problematic (Maxwell 2009b) and that it is possible to make improvements on these aims. If left uncriticized or if pursued dogmatically, science may, without any surprise, fail to improve on its aims. What is more serious, science may fail in its task to help solve those problems which challenge Earth and humanity. Thus, AOE sets a task for philosophers and scientists. This is the task of relentlessly seeking to improve upon the aims of science. Quite appropriately, addressing the world's universities, Maxwell's philosophy urges them to transform the philosophy of knowledge, so pre-dominant in the current academic life, into a philosophy of wisdom and wisdom inquiry. However, the question which needs to be debated in this context is whether world's universities are ready for putting wisdom inquiry into practice (Gillies 2009, pp. 147–152, 159–160). This and other questions I am going to raise may not be answerable immediately. But some of them may be answerable with reference to Maxwell's (1984, 1998, 2004, 2009a, b, c) admirable attempts to restate and defend his AOE more thoroughly and rigorously.

While arguing that KI urgently needs to be transformed into WI, Maxwell (2009b, pp. 31-32) builds a contrast between them as follows: "Wisdom-inquiry, because of its greater rigour, has intellectual standards that are, in important respects, different from knowledge-inquiry. Whereas knowledge-inquiry demands that emotions and desires, values, human ideals and aspirations, philosophies of life be excluded from the intellectual domain of inquiry, wisdom-inquiry requires that they be included". Articulating problems of living, and proposing and assessing possible solutions is the fundamental intellectual activity of WI (Maxwell 2009b, 36). The case for WI is essentially built by arguing that instead of pursuing science within standard empiricism, it should be pursued within a broader framework, viz., wisdom inquiry (Maxwell 2009b, pp.33-34):

> "The scientific aim of acquiring knowledge makes implicit, problematic assumptions concerning metaphysics, values and politics. The idea that science

> seeks truth dissociated from assumptions concerning metaphysics, values and politics (the human use of science) is untenable. Once this point is acknowledged, it becomes clear that science is more rigorous intellectually if it subjects assumptions concerning metaphysics, values and politics to sustained criticism, in an attempt to improve them… once it is acknowledged that problematic assumptions concerning values and politics are, inevitably, inherent in the aims and priorities of research, it becomes a matter of vital importance that academia has available intellectual/institutional means progressively to *improve* these assumptions. Wisdom-inquiry provides these means, whereas knowledge-inquiry does not".

At this point, Maxwell's argument takes a decisive turn, bringing in strong moral considerations against the view that science should exclude all values (Maxwell 2009b, pp. 33-34):

> "First, substantial public funds are devoted to supporting science in the expectation that science will benefit humanity. Given this, how can it be morally justifiable to defend a conception of science (a) which holds that any human value science has is purely incidental, and (b) which is *damagingly irrational* when judged from the standpoint of human value? Second, science in any case has a massive impact on society. Do not scientists have a prime responsibility to ensure that science is pursued in such a way that this impact is as good as possible? This means science should be pursued within the framework of wisdom-inquiry. Third, humanity is in deep trouble, and urgently needs to learn how to manage its affairs more wisely. It must be immoral to oppose a kind of academic inquiry rationally designed to help humanity learn this vital lesson".

Maxwell (2009b, pp. 35-36) adds to this his diagnosis of the failure of science as being pursued within standard empiricism, as if it was a value-neutral enterprise:

> "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, the flourishing of one's career or research group, as the existence of biter 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* which gave rise to this knowledge… All this tends to reduce education to a kind of intellectual indoctrination, and serves to kill "holy curiosity"… Real education, which must be open-ended, and without any pre-established goal, rarely exists in universities, and yet few notice".

Assuming that it is possible to move from science as pursued within standard empiricism to science as pursued within AOE, this should have consequences for other philosophies of science. In particular, it should be possible to show how this improves on some of them, e.g., Karl Popper"s falsificationist methodology of science and its generalized version of critical rationalism. We shall discuss this point later in "Maxwell's Defence of Aim-Oriented Empiricism and Wisdom Inquiry".

The basic strategy of moving from the correctly identified aim of science to its methodology is common to Popper and Maxwell (Pandit 2009). While discussing

the aim of science, Popper (1983, xix-xxx) tells us: "Since the publication of the *Logik der Forschung* (that is, since 1934) I have tried to start with some suggestion about the aims of scientific activity, and to derive most of what I have to say about the methods of science—including many comments about its history—from this suggestion". Popper and Maxwell also share the same strategy of generalizing the methodology of science, extending the generalized versions to all inquiry and to all life viewed as problem-solving activity (Popper 1994). While referring to his argument for AOE in his book *The Comprehensibility of the Universe* (1998), Maxwell (2009b, p.37) recalls:

> "I argue that aim oriented empiricism solves a range of fundamental problems in the philosophy of science which cannot be solved within the framework of standard empiricism, including the problem of induction, the problem of verisimilitude, and the problem of simplicity, or unity, of theory".

'Once I had arrived at the idea', says Maxwell (2009b, p. 249), 'that, because the aims of science are profoundly problematic, science needs to try to improve its aims and methods as it proceeds, I was led to generalize this idea to all of academic inquiry and, in a way, to all of life. Thus did I stumble across my "from knowledge to wisdom" argument …'.

Elsewhere, Maxwell argues that we need to bring about a revolution in science, and in academic inquiry more generally, so that the aim of academia becomes to seek and promote *wisdom*. According to him, wisdom is the capacity to realize what is of value in life, for oneself and others. Wisdom in this sense includes knowledge, technological know-how and understanding, but much else besides. As he puts it (Maxwell 2010):

> "The outcome of this revolution would be a new kind of inquiry, potentially more rigorous and humanly valuable than what we have at present. It would put *problems of living* at the heart of the academic enterprise, problems of knowledge emerging out of and feeding back into this central intellectual concern. Aim-oriented empiricist science would be an integral part of this new kind of wisdom-inquiry".

Thus, like Popper, Maxwell develops his view by arguing, *first*, from a rationally chosen aim to the methodology of science. *Secondly*, having arrived at a methodology of science, he argues from it to its generalized version, thereby using the methodology of science as a key to all inquiry and all problem-solving activity. (Maxwell 2009b, p. 31). And, *thirdly*, with a view to seeking better alternatives to the assumptions science makes about metaphysics, values and politics, he argues from the generalized methodology, trying to criticize and improve these assumptions, making science far-reaching. Thus, the generalized version is applied to all inquiry and to the activity of improving the aims of science, these being highly problematic. I shall come back to this aspect of Maxwell's approach in "How Far-Reaching is then the Rationality of Science?" below.

How Far-Reaching is Then the Rationality of Science?

According to Maxwell (2009a, xii-xiii), "The pursuit of scientific knowledge dissociated from a more fundamental concern to help humanity improve aims and methods in life is a recipe for disaster. This is the crisis behind all the others

(Maxwell 2009a, xii-xiii)". Both Popper and Maxwell lay great emphasis on the proper choice of an aim for science. They also require that properly conceived rules of rationality, applicable to science, be properly generalized and extended to everything beyond science (Maxwell 2009a, vii). Consider Maxwell's view (2009a, vii) "that science, properly understood, provides us with the methodological key to the salvation of humanity." AOE, "if taken seriously, just might save the world":

> "Just as Popper had generalized falsificationism to form critical rationalism, so I could generalize my aim-oriented empiricist conception of scientific method to form an aim-oriented conception of rationality, potentially fruitfully applicable to all that we do, to all spheres of human life (Maxwell 2009a, ix-x)".

The main important point to be noted here is this. It is not Maxwell's intention to suggest as if every problem-solving activity outside science could be directly brought within the purview of the rules of rational scientific problem-solving. On the contrary, nothing short of an intellectual revolution to put aim-oriented rationality and wisdom inquiry into practice can save the humanity from the present crises, including the global crises of climate change. Maxwell (2009a, xi-xii) argues that

> "All our current global problems are the almost inevitable outcome of our long-term failure to put aim-oriented rationality into practice in life, so that we actively seek to discover problems associated with our long-term aims, actively explore ways in which problematic aims can be modified in less problematic directions, and at the same time develop the social, the political, economic and industrial muscle able to change what we do, how we live, so that our aims become less problematic, less destructive in both the short and long term. We have failed even to appreciate the fundamental need to improve aims and methods as the decades go by".

In other words, aims are problematic not only in science but in life as well. They are misconstrued or "repressed" both in science and in life (Maxwell 2009a, x). Improving on Popper's approach to the aim and method of science, Maxwell approaches these as follows (Maxwell 2009a, x):

> "We urgently need to build into our scientific institutions and activities the aims-and-methods-improving methods of aim-oriented empiricism, so that scientific aims and methods improve as our scientific knowledge and understanding improve. Likewise, and even more urgently, we need to build into all our other institutions, into the fabric of our personal and social lives, the aims-and-methods-improving methods of aim-oriented rationality, so that we may improve our personal, social and global aims and methods as we live".

What are the implications for the philosophy of science, which seeks to articulate the rationality of science, its aims and methods? Is it the prerogative of philosophy to pursue wisdom? If yes, how are we, philosophers and non-philosophers, going to cope with the philosophical abstractions, e.g., truth, freedom, rationality and wisdom? The danger inherent in all philosophical abstractions, as Paul Feyerabend (1975, 1978) had warned us, lies in their immediate irrelevance to the urgent problems of improving the human condition on Earth, or to meeting the global

challenges which humanity faces. Ordinary people as well as non-philosophers may find them equally beyond their comprehension.

The original Greek word *philosophia* is normally translated as 'love of wisdom'. However, as Steve Fuller (2009, p.83) points out:

> "Actual philosophers despise 'philosophy' just as actual democrats despise 'democracy'. However, the inconsistency in both cases is due less to hypocrisy than catachresis. In other words, 'philosophy' does not quite capture what normatively acceptable histories of Western philosophy are about, just as 'democracy' does not quite capture what normatively acceptable histories of democracies are about."

The truth is, admits Fuller (2009, pp.83-84), that Western philosophy has never really been about wisdom, where 'wisdom' may be understood in any number of senses permissible in the Western philosophical tradition. This seems to hint at the paradoxical situation where not just the politicians (think of Politik als Kampfsport) but even philosophers have been engaged in playing someone else's games.

The same kind of question arises with regard to science itself. What is the aim of science? Does science aim at truth, pure and simple, as Popper and others thought? For both Popper and Maxwell the question is important. But the answer to this question may wary radically from philosopher to philosopher depending upon which philosophy one wishes to advocate. For both of them, philosophy and methodology of science seek to correlate aims of science with its methods. A properly chosen aim for science is crucial to getting at its methodology, the former serving as a resource for the latter. Once the methodology of science is in place, the stage is set to extend its main keys to problems outside science, to life as a (problem-solving) whole. The metaphysical assumptions which science makes but hesitates to state explicitly should also be brought within the purview of the generalized methodology. This can be done by stating these assumptions explicitly and clearly. They must then be articulated and criticized according to the generalized methodology. Thus, if the generalized methodology is successful, these assumptions may even be replaced by better alternatives (Roger 2009, pp. 217–232).

The question arises how we can judge whether the generalized methodology is really successful. Together with this, a more fundamental question must be asked: Can the (rationality of) sciences (and technology) provide a methodological key to solving problems of life rationally and wisely? Can the methodology of science, using a rationally chosen aim for science as its resource, be extended to all inquiry and to life as a whole by a process of generalization? By its own logic, Maxwell's argument (1976, 1984, 1998, 2004, 2009a, b, c) develops through following steps. Maxwell's *first* move involves going from metaphysical assumptions science makes implicitly to the correctly determined aim of science, after stating those assumptions explicitly. Once metaphysical assumptions, science makes implicitly, are stated explicitly and articulated, they will inevitably play a role in the choice of an aim, from possible aims, for science. His *second* move involves going from the rationally chosen aim to the methodology of science. This step makes it possible for science to progress along specific methodological appraisals of its theories T1, T2 …, and Tn as follows:

> Given the aim of science, that theory from the group of *its* competing theories (T1, T2 …, and Tn) is the best which achieves its aim better than the rivals themselves.

This shows how through the *first* and the *second* step, the methodology of science and the aim of science get so strongly correlated with each other that it is possible to read off the one from the other: *If we know what science aims at, we also know its methodology; and if we know its methodology, we also know what it aims at.* This is exactly how most methodologies or philosophies of science of the 20th century deal with the problem of method. Here, the main question is how can we move forward in order to improve upon AOE? Do we do so by repeating the Popper-Maxwell strategy or by doing something radically different?

Maxwell's *third* move involves generalizing the methodology of science to make it applicable to all inquiry and all human activity—i.e., improving the aims and methods of *science*, making it more rational, responsible and far reaching. Maxwell's *final* move involves applying the generalized methodology to the explicitly stated metaphysical assumptions, science makes, with a view to criticizing and improving them, and even finding better alternatives. One might ask how Popper's (1959, pp. 49–56) strategic hierarchical view of methodological rules (with the principle of falsifiability providing the supreme rule) differs from Maxwell's strategic hierarchical view of problematic aims of science or of the progress-achieving methods of science. The question assumes significance, given the strong correlations between the aims and methods of science. Maxwell's *first*, *second*, *third* and *final* steps bear a close similarity to the philosophy of Karl R. Popper (Popper 1959, Popper 1983, Pandit 2009a). Yet, we cannot rule out significant differences between them.

Unlike Popper's (realist) conception of truth as the fixed aim for science, Maxwell advocates the view that physics or science aims at truth which is presupposed to be unified and explanatory. Again unlike Popper's falsificationism, which correlates fixed aim with fixed method, Maxwell's AOE requires that the problematic aim of physics must be represented in the form of a hierarchy of aims, "the fixed methods of physics being metamethodological in character, in that they specify how evolving more specific aims and methods can be developed and assessed". The differences between Popper's and Maxwell's approach need to be articulated in greater detail, a task which I leave for another occasion. Taken together, all the above four steps in Maxwell's approach are necessary to the task implementing AOE and aim-oriented rationality, and transforming knowledge inquiry into wisdom inquiry. By seeking genuine improvements in the assumptions science makes about metaphysics, values and politics, it should be possible to improve the aims and methods of *science* themselves, making it more rational, more rigorous and far reaching:

> "Aim-oriented empiricism, I have argued at length in my work, has profound implications for policy issues. For, it is not just in science that basic aims are problematic; this is the case in life too. Whenever our (personal, institutional or global) aims are problematic, we need to represent them in the form of a hierarchy, thus creating a framework of relatively unproblematic aims and methods within which more specific and problematic aims and methods may be improved as we act, as we live. Science is of value, not just culturally and technologically, but also methodologically—but in order to exploit this third use of science properly in personal, social and institutional life, it is essential to get clear about what the progress-achieving methods of science are. These methods (or meta-methods) are depicted by aim-oriented empiricism (Maxwell 2010)".

There still remains the question how we can find out that science, properly understood, provides the methodological key to the salvation of humanity, whether now or in the future. How do we resolve the dilemma of choosing between the rival ideals for a rigorous, successful and rational science? How does the methodological key promised by AOE ensure a successful movement from knowledge to wisdom? For example, the aims and methods of science may be ideally conceived to co-vary or co-evolve according to the philosophy of science one wishes to advocate. How can we test such a philosophy against the actual scientific practice, and how can we test the latter against the former? To pose this question differently: How can we test the claim that standard empiricism, the official conception of science which says that the main aim of science is to improve our knowledge of value neutral factual truth, misrepresents the main aims of science? An answer to this question is available in Maxwell's (2009a, pp. 24–26) declaration that standard empiricism is a misconceived philosophy of science in the sense that it

> (a) fails completely to make rational sense of science; (b) serves, if anything, to obstruct rather than promote scientific progress; and (c) utterly disrupts, dislocates the delicate, harmonious, and humanly valuable relationships that ought ideally to exist between science and people.

Having said that, yet he recognizes that science has made progress despite its "official, institutional acceptance of standard empiricism, not because of it." But how can we explain this? Here Maxwell (2009a, xii) recognizes that "Science has met with such astonishing success because it has put something like aim-oriented empiricism into scientific practice—but this has been obscured and obstructed by the conviction of scientists that science ought to proceed in accordance with standard empiricism—with its fixed aim and fixed methods".

Maxwell's Defence of Aim-Oriented Empiricism and Wisdom Inquiry

There arise three basic issues which demand our urgent attention. These may be formulated as follows:

(1) Can science itself provide the resources, e.g., values, without which it is not possible to improve its problematic aims?
(2) Does scientific progress invariably provide the context, or the standard frame of reference, for all other kinds of progress that mankind is capable of in different fields of life?
(3) And can science and technology provide solutions to *any* current or future problems that arise from the adverse impact human activities have on Earth's ecosystems on the one hand and on the future generations on the other?

In today's knowledge society, the third question is ritualistically answered in the affirmative. As regards the second question, Maxwell (2004, pp. 68–112, 2009, p. 24–37) proposes an answer in the affirmative. He bases his proposal on his requirement seeking to replace the Traditional Enlightenment (TE) of the 18th century going back to Voltaire, Diderot, Condorcet et al. by what he calls New Enlightenment (NE). In what follows, after taking a closer look at Maxwell's

approach, I shall argue that both these questions must be answered in the negative. As we proceed, it will become clear why also the first question must be answered in the negative. This question may be properly reformulated as follows: If the aims of science, being essentially problematic, need relentless improvement, can science provide the resources, e.g., values, to bring about the necessary improvement?

To begin with, we may ask, with Maxwell (2004), whether science suffers from "rationalistic neurosis", a damaging but rarely noticed methodological disease (Maxwell 2004, ix). Maxwell (2004, pp. 68–112) argues for an answer to this question in the affirmative, advocating that this disease has caused much damage to science in particular and to social and academic inquiry in general. This diagnosis does not signal that there is a crisis of knowledge production. It only suggests that science is in crisis which may be described as a crisis of knowledge production without wisdom. What is worse is that it is not "just the natural sciences which suffer from this condition. The contagion has spread to the social sciences, to philosophy, to the humanities more generally, and to education. The whole academic enterprise, indeed, suffers from versions of the disease" (Maxwell 2004, ix). Following this diagnosis of the human condition of knowledge and education, Maxwell (2004, ix, Ch. Three) tells us how it blocks our way to "progress towards a wiser, more civilized world". Rationalistic neurosis has the effect of preventing mankind from developing traditions and institutions which would help us learn how to live more wisely. Thus, it prevents us from learning what is of value in life. In this situation, there arises the most important question whether there is a way forward for humanity, from knowledge to wisdom, with a different future for science and for social and academic inquiry more generally.

The orthodox view of scientific rationality holds that in science no assumption can escape scrutiny within the standard frame of reference of empirical evidence. Maxwell (2004, xi) argues that this requirement is not fulfilled in the case of the substantial metaphysical assumption that the universe is physically comprehensible, an assumption without which science cannot proceed. As a result, the metaphysical assumption of comprehensibility is repressed under the pretension that no such assumption occurs in natural science. It is at this point that rationalistic neuroses occurs and damages science. What is true of the metaphysical assumption of comprehensibility is also true of values and their role in science. Both are influential yet highly problematic in scientific research. It is quite symptomatic of rationalistic neuroses to pretend as if values, like the metaphysical assumptions, played no role at all in science. Suppression of values, resulting in the persistent failure of science policy globally, becomes increasingly visible in the lack of wise investment in those areas of research and development which are in the long-term human interest.

Maxwell elaborates and boldly defends a new conception of natural science, viz., AOE. Where natural science is concerned, AOE enables him to argue for a return to natural philosophy (Maxwell 2004, pp. 47–51). Beyond this, it enables him to relentlessly and passionately pursue the fundamental problem of how to learn from scientific progress towards greater knowledge how to achieve social progress towards a civilized world with greater wisdom. My immediate concern here is the latter which reminds us of the TE of the 18th century going back to Voltaire, Diderot, Condorcet et al. In its pursuit, *four* things are most crucial. First, it is most important not to repeat the blunders of the TE as Maxwell (2004, pp. 74–94, 2009,

pp. 24-25) diagnoses them. Secondly, as would become clear below in a moment, it is important to characterize the progress-achieving methods of science correctly. Thirdly, it is important to introduce improvements and innovations into TE in the present-day context, which can take humanity beyond TE. And, fourthly, it is also important to recognize as guiding principles the following principles brought in by Maxwell: (1) "In order to create a more civilized, enlightened world, the problems that we need to solve are, fundamentally, problems of living rather than problems of knowledge". And (2) "in order to make progress towards a sustainable, civilized world we need to learn how to resolve our conflicts in more cooperative ways than at present". As regards this second principle, Maxwell tells us emphatically that there is a lot to learn from how rationally science progresses towards greater knowledge.

TE thus replaced by NE employs what Maxwell (2004, pp. 94–97) calls aim-oriented rationality (AOR), which represents "a conception of reason that is designed quite specifically to improve problematic aims, and cure rationalistic neurosis". This implies, first, that social inquiry becomes social methodology (arguably different from Karl Popper's piecemeal social engineering) without any pretensions to being a science and, secondly, that promotion of the growth of wisdom becomes a basic aim of academic inquiry, more generally.

The question arises how revolutionary or profound is then NE? Arguing for NE, Maxwell (2004, p. 100) points out: "The proper, basic task of social inquiry is to get into our diverse institutions, traditions and ways of life, into the fabric of society, general progress-achieving methods (PAMs) arrived at by generalizing the progress-achieving methods of science" as against the "neurotic aim" of restricting its task to acquiring knowledge of social phenomena. In this whole picture (Maxwell, 2004, p. 98, 2009b, pp. 24–31), quite clearly, the PAMs of science play the most central role, assuming at the same time that they are being characterized correctly. Thus, NE stands for "extracting progress-achieving methods from science, generalizing them, and applying them to other institutions and aspects of social life"—to academia, the arts, the media, industry, government, international relations, education, and so on and so forth. This idea goes beyond TE insofar as TE blundered by wrongly promoting the idea of developing social inquiry as a social science. TE set a different set of priorities altogether, requiring that knowledge of society be developed first. Once the required knowledge was produced, it was then sought to be applied to solve social problems.

Touching all disciplines, the most fundamental question Maxwell raises is this: Whether mankind, with all the challenges the institutions of learning face today globally, can move forward from traditional knowledge-inquiry to wisdom-inquiry, freeing science from a defective philosophy of science and academic inquiry from a defective philosophy of inquiry? How to help humanity learn how to solve its conflicts and problems of living in increasingly cooperatively rational ways? Maxwell calls for a revolution in the aims and methods of science and in academic inquiry generally so as to solve the most urgent problems faced by humanity globally. For example, think of the host planet Earth and its life-supporting ecosystems. And think of the damage human activity causes to these systems and, consequently, to the future generations. Since alternative ways of organizing our corporate activities and social or cultural life on our planet cannot be ruled out, the question is how we might integrate knowledge, wisdom and values in order to put an

end to a fragmented approach to philosophy and science, to education, economy, politics and institution building.

As Maxwell (2004, pp. 19–28) tells us, AOE is intended to be "a kind of synthesis of the views of Popper, Kuhn and Lakatos". At the same time, it is intended to be an improvement over the views of all the three. This claim, which calls for close scrutiny, is bound to throw up more questions in view of the highly controversial character of these views themselves. This is particularly true of Thomas Kuhn whose views have seen rapid changes and whose shifting argument is heavily dependent on the systematically ambiguous metaphors of a paradigm, disciplinary matrix, translation and lexical taxonomy.

On the other hand, one might wonder whether or how AOE also implies an improvement on Popper's (1982) view of development of physical theory as involving influential 'metaphysical research programmes'. This question makes sense, since AOE focuses on problematic metaphysical assumptions implicit in science. To quote Popper (1982, p. 161): "In using this term I wish to draw attention to the fact that in almost every phase of the development of science we are under the sway of metaphysical—that is, untestable—ideas; ideas which not only determine what problems of explanation we shall choose to attack, but also what kinds of answers we shall consider as fitting or satisfactory or acceptable, and as improvements of, or as advances on, earlier answers". And to this Popper (1982, p. 161) then adds further: "I call these research programmes 'metaphysical' also because they result from general views of the structure of the world and, at the same time, from general views of the problem situation in physical cosmology. I call them 'research programmes' because they incorporate, together with a view of what the most pressing problems are, a general idea of what a satisfactory solution of these problems would look like. They may be described as speculative physics, or perhaps as speculative anticipations of testable physical theories".

Thus, AOE of Maxwell (2004) raises more questions than it is possible to discuss here. Very generally, one such question relates to AOE's requirement that the implicit metaphysical assumptions, which the natural sciences make persistently, be made explicit. And, once these are made explicit, these sciences would be freed from their states of repression, enabling them to develop better alternatives to these very assumptions with a view to improving what is accepted by them as scientific knowledge. Of course, this is not meant to imply that this would automatically take us from knowledge to wisdom or from absence of values to their presence.

More specifically, consider the case of physics. In its persistent preference for and acceptance of unified theories, physics makes a persistent untestable metaphysical assumption that the universe is such that no seriously dis-unified, *ad hoc* theory is true (Maxwell 2004, 10–12). This being a substantial, influential yet highly problematic and implicit assumption, AOE demands that (a) it be made explicit and articulated as part of scientific knowledge and (b) it be debated with a view to developing its improved versions. No doubt, serious considerations of scientific rigor and rational discussion in the context of scientific appraisal of theories add to the importance of this demand. Fulfilling this demand implies giving a chance to scientific appraisal of theories to improve, beyond the received views or established practices. There are also considerations of neurosis of science or of scientific practice which Maxwell has in mind in proposing AOE over Popper, Kuhn and Lakatos.

In final analysis, the question is what is wrong with philosophy of science of the 20th century. What is lacking in the rules of rational acceptance or rejection of theories by the physicists? Is there a way forward to improving the rules of scientific appraisal of theories and their rational acceptance or rejection, which takes us beyond Popper, Kuhn and Lakatos? According to Maxwell, AOE conceived as an improvement over all the three philosophers is the answer. Here Maxwell's detailed discussions of problems of simplicity, induction, unity of physical theory and rational discovery of new fundamental physical theories, among other subjects, go a long way to substantiate his claims. To quote: "Current philosophy of science is a deeply neurotic activity. Not only is the philosophy of science beset by long-standing problems about the nature of science, which resist all attempts at solution—most notably problems of induction and simplicity. In addition, work done in the philosophy of science seems to have no impact on science itself whatever. All this is symptomatic of the philosophy of science being the neurotic face of science" (Maxwell 2004: 39-40; and Appendix).

While sharing Maxwell's concern with the absence of wisdom in the scientific pursuits and academic institutions of learning, how effectively can we interrogate "science without wisdom", science as articulated by the dominant philosophies of science? It is a task which poses the greatest challenge to the experts, since it goes against their creed. It equally challenges the lay-people, or those who are neither initiated nor trapped in knowledge society so highly ritualized by the present day practices of philosophy of science. It was Bertrand Russell (1948: Preface) who reminded us that "Philosophy proper deals with matters of interest to the general public, and loses much of its value if only a few professionals can understand what is said". The task Maxwell (2004) sets for the academia, for society and economy and the argument he develops for AOE science fulfills this expectation. Maxwell (2004, p.220) quite admirably sets a task for philosophers and the scientific community. This is the task of staging a comeback to natural philosophy and trying to implement AOE science.

In a deeply significant way, Maxwell (2004) boldly opens an urgently needed debate on science, philosophy, education, environment and institution-building, among other important subjects, and lays the foundations for much sought-after wisdom-inquiry. Interrogating science and philosophy relentlessly, as he does in this context, is a most admirable step in this direction. However, concerning one of its fundamental principles which we briefly considered above, I would like to pose a few questions.

No doubt, there is a great merit in the point Maxwell (2004, Preface: xv) makes as follows: "I write in the hope that there will be a few who will not dismiss out of hand the suggestion that the question of how we are to go about learning how to live in wiser and more civilized ways might have something to learn from scientific learning, and will take the trouble to pursue the line of argument traced out in this book". Long ago, Karl Popper (1975) had hinted at something similar when he wrote his Essay "The Rationality of Scientific Revolutions". Nevertheless, the question remains why is it necessary not just to *assume* but to advocate that it is possible to learn from the way science progresses towards greater knowledge how we can make social progress towards greater wisdom. Despite the rituals of knowledge society reigning supreme, is it puzzling that humanity has failed to do so until now? Even if

science and scientific progress may be a great teacher for humanity to follow in solving problems of living in wiser and more civilized ways, we don't have to ritualize all this (in the fashion in which Thomas Kuhn ritualized normal science).

On the contrary, there is a greater urgency today than ever before, to understand science itself in a whole diversity of contexts. Philosophy no more enjoys the role it once played as a dominant context of scientific discovery—say, roughly from 1880 to 1930. Today this role is being played at an incredible speed by the great nexus between the state, the knowledge-based economy, the industry, the military and the market forces. This is the kind of situation in which, under the influence of business, political and military interests, the rituals of knowledge society assume ascendancy over human values of dignity, freedom, wisdom and moral progress. In this situation particularly, it would be highly unreasonable to demand a renewed loyalty to the old TE belief:

> That scientific progress is invariably to serve as the context, as the standard frame of reference, as it were, for all other forms of progress.

This TE belief implies that problems of social and moral progress should be seen and dealt with only with reference to scientific progress, as if science were the source of all values.

Which path should we then follow, if we want to turn academic inquiry into a wisdom inquiry, particularly if science and the 2oth century philosophy of science are part of the problem and if we are willing to go beyond the rituals of knowledge society? Whichever path we might follow, the question, which is rarely asked, is where do we look for values, without which it is not possible to improve the problematic aims of science or those of academic inquiry in general. Whether we can ignore forms of culture as forms of wisdom, which have either been lost or which are disappearing faster than one could have imagined? We must remember that our basic feeling for wisdom, and our basic understanding of it, is rooted in our past. The question is how should we allow ourselves to be guided by values rooted in our cultural past, if our inquiry into wisdom is to move forward? Let us take an example. Today, all of us are willing to acknowledge how much damage we have ourselves done to the host planet Earth, to its environment and ecosystem-services, over the past centuries. Even if it is an inconvenient truth for the developing countries of the world which are eager to urbanize and industrialize, it is wise to admit what is at stake globally. All of us may be willing to do something to cope with climate change while adopting the necessary measures for checking global warming. Thus, we talk of technological innovations and alternative sources of energy for reducing the present levels of CO2 emissions in this context. But we never think of the forms of culture which were environment-friendly and which we have lost. Only a century ago, in most of the societies in the world, older values required that the children have a better quality of life than the parents. Sustainability at the level of society and economy had its roots in the culture of the family. In an important sense, there is nothing new in today's sustainability campaigns and arguments. We are only rehearsing older, though forgotten or disappeared, cultural and family values.

No doubt, in today's highly globalized information society, the state and its science policy, technology, industry and market are major players. They make those things happen for us all, as individuals in civil society, or as representatives of the

corporate world, governments and international organizations, which would be unthinkable otherwise. Think of people and their institutions worldwide. It has become possible for them to come together at incredible speeds in order to deliberate on possible solutions to urgent problems, both regional and global. But the reason why they find it *valuable* to do so, passionately addressing issues of concern to mankind, lies outside science, technology and market. Again, think of TE and its idea of learning from scientific progress how to achieve social progress towards a more civilized world. If today we put a high value on such learning, as TE or NE does, the reason why we do so lies outside science. This will become clearer the moment we critically reflect on the question of how to implement the TE/NE idea of social progress properly and correctly. The criteria of correctness in the context of this question lie outside science. This is so because the answer to this question must come from how correctly we are able to address the following three demands. First, how correctly are we able to identify and characterize the PAMs of science. Secondly, how correctly are we able to generalize them so that "they become fruitfully applicable to any worthwhile, problematic human endeavour, whatever the aims may be, and not just applicable to the one endeavour of acquiring knowledge". And, thirdly, how correctly are we able to exploit the generalized PAMs of science with a view to making social progress towards an enlightened, wise world, by applying them to policies and proposals for action. With Maxwell, we may say that the PAMs of science, when correctly identified and generalized, have something important to teach us about how to make progress in other fields of human problem-solving activity.

No doubt science itself needs values, if it is to remain not just in business but in-charge of itself. It needs values, if it is to improve its problematic aims, relentlessly. But where do we look for these values? If, as Maxwell (2004, xii) recognizes, "Science fails to pursue those avenues of research that lie in the best interests of humanity", they cannot come from science. In any case, if its aims are inherently problematic, it cannot provide those values which are needed to improve its aims. Along with scientific progress, economy and society need moral progress. Science itself cannot provide criteria in the loftiest realms of value, wisdom and moral progress? Of course, for all these, we have to look elsewhere (?). We may have even to retrieve that which is taken to have been lost and forgotten. We have to do soul-searching within universal interconnectedness (Pandit 1995, 2001, 2005, 2006, 2007a). We have to foster moral self-development. In other words, in today's knowledge society our questions should not be restricted to finding out how we are being governed. We should keep asking the more important question: How ought we to be governed? Along with the task of relentlessly asking, with Maxwell (2004), how we can learn wisdom, it is important to learn to interrogate the influential totalitarian assumptions among philosophers and policy makers such as the following:

> That scientific progress invariably provides the context, as it were the standard frame of reference, for all other kinds of progress. And, science and technology must provide solutions to any current and future problems arising from human activities and their impact on our host planet Earth's ecosystems.

Both these powerful assumptions can blind us to the urgent need for exploring alternative ways of dealing with nature, i.e., alternative ways of organizing political economy and society, whether locally or globally.

Priority of Wisdom Inquiry over Knowledge Inquiry Within Reformed Institutions

Friends of Wisdom (FoW) came into being in the year 2003 (www.knowledgetowisdom.org, *Friends of Wisdom Newsletter* No.1, Nov. 2007 and No. 3, July 2008). Represented by an international group of over 200 scholars and educationists, FoW advocate the view that WI should be given a priority over KI at the universities. However, the systematic attempt to develop relevant arguments, urging those in powerful positions to heed the suggestion that there is a need for intellectual revolution in order to bring about the change from KI to WI in the Universities, is much older (Maxwell 2009a, b).

We live in a world known for (a) knowledge-production without the relevant values to guide its wise applications and (b) general political-economical institutional break-down (a process of creative destruction, as Joseph Schumpeter chose to describe growth) amidst increasing inter-dependence among the different economies of the world. If properly institutionalized at the Universities, to begin with, we may expect WI to guide humanity at various frontiers. It may help us in exploring the way forward, taking us beyond our world driven by science, technology and the market, a world tormented by the global environmental and climate crises. The debate among the FoW members on different aspects of the present human condition of KI is on. There is even a consensus as regards the main task of rethinking all that which the world's leaders and the mechanisms of the state so ritualistically celebrate as an achievement, or as an object of rational scientific study or as economic and technological progress. In this direction, FoW seek to address the following question:

> Guided by a properly conceived WI, how ought we to go about the task of solving those problems which currently challenge humanity, e.g., the problems of improving, and revolutionizing, where possible, the conditions of human life, human knowledge, human values and human freedom? To underline the importance of the task, using an ecological metaphor: How ought humanity to rethink its place in nature, i.e., with respect to the host planet Earth, which is itself challenged? In order to wisely solve the problems of living, how ought our institutions, including the universities and research institutions, to undertake reforms without polluting that river in which we ourselves are afloat, or those seas into which each river flows, or those forests in whose health every species is reflected?

If we do not, individually and collectively, undertake the task of finding proper answers to these questions, we would be failing in our duty. We would be guilty of conspiring with those who indulge in self-perpetuation, arrogantly and ritualistically promoting themselves and their businesses as usual, playing not those games which they are thought to be playing, but someone else's games. We may, e.g., think of the mighty politicians–in-charge of the social and political institutions burdened with mountains of beaurocracy world-wide, of the profit-oriented corporate world and of the market-driven knowledge society.

In a nutshell, we can conclude with Maxwell (2009b, p.56) that "A human world which has had the good sense to take wisdom-inquiry seriously would have the capacity to improve aims as a part of life, and would thus be able to make progress

towards a better world. A world without wisdom-inquiry will continue to blunder… from disaster to disaster, the disasters becoming more serious as our powers to cause havoc become greater and more widely distributed".

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