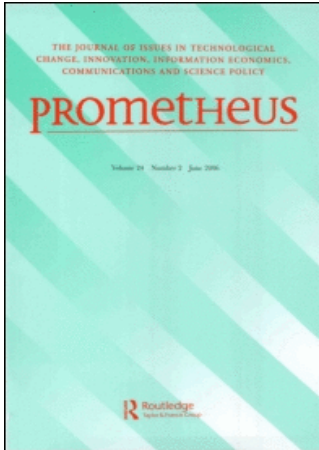


This article was downloaded by:[University of Queensland]
On: 6 May 2008
Access Details: [subscription number 778575467]
Publisher: Routledge
Informa Ltd Registered in England and Wales Registered Number: 1072954
Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Prometheus

Publication details, including instructions for authors and subscription information:
<http://www.informaworld.com/smpp/title~content=t713442842>

Should the Knowledge-based Economy be a Savant or a Sage? Wisdom and Socially Intelligent Innovation

David Rooney; Bernard McKenna

Online Publication Date: 01 September 2005

To cite this Article: Rooney, David and McKenna, Bernard (2005) 'Should the Knowledge-based Economy be a Savant or a Sage? Wisdom and Socially Intelligent Innovation', Prometheus, 23:3, 307 — 323

To link to this article: DOI: 10.1080/08109020500211025
URL: <http://dx.doi.org/10.1080/08109020500211025>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article maybe used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Should the Knowledge-based Economy be a Savant or a Sage? Wisdom and Socially Intelligent Innovation

DAVID ROONEY & BERNARD MCKENNA

ABSTRACT *Discourse about knowledge-based economies rarely moves beyond the commercialization of science and engineering, and is locked in the discursive limits of functionalism. We argue that these discourses limit the scope of what knowledge-based economies might achieve because they are uninformed by an adequate conception of knowledge. In particular, knowledge management and knowledge-based economy discourse has not included the axiological dimension of knowledge that leads to wisdom. Taking an axiological perspective, we can discuss policy frameworks aimed at producing the social structures needed to bring fully formed and fully functioning knowledge societies into being. We argue that while the dominant discourse of industrial modernity remains rationalist, functionalist, utilitarian and technocratic, knowledge-based economies will resemble a savant rather than a sage. A wisdom-based renaissance of humanistic epistemology is needed to avoid increasing social dysfunction and a lack of wisdom in complex technological societies.*

Keywords: Knowledge-based economy; technocratic functionalism; ethics; wisdom; communicative action; Aristotle; humanistic epistemology.

Two fundamental observations motivate this article: (1) that very little of the energy spent discussing knowledge-based economies actually countenances the ontological and epistemological foundations of knowledge;¹ and (2) that, as a consequence, much policy-level discourse about knowledge-based economies is limited by shallow technocratic, functionalist, utilitarian values.² The dangers of such shallow concerns are made clear in historical analyses by David Landes, Bernard Cohn, and Barbara Benedict.³ They clearly show that society incurs significant costs when policy, scientific, industrial and intellectual leaders under-value critical aspects of knowing such as curiosity, creativity, insight and imagination when pursuing functionalist knowledge goals such as knowledge management or innovation management. Our central concern in this article is that when the discourse of the knowledge-based economy elides these transcendent forms of

knowing, there is little chance of wisdom entering knowledge-related policy discourse as an explicit objective for knowledge-based economies. If this happens, we argue, socially intelligent innovation (change) that is inherently ethical is unlikely to occur. We, therefore, explicitly focus on demonstrating why wisdom should be part of knowledge-related policy discourse. We argue further that wisdom is a necessary component of knowledge-based economies and that it should not be subordinated to the narrow imperatives of technological development within the socio-economic context of technocratic capitalism. We posit that the choice to include or exclude the gift of wisdom in policy-level discourse about a knowledge society or a knowledge-based economy will determine whether the social and economic outcomes are characteristic of the savant or sage.⁴ We will elaborate this distinction later in the paper. However, to make our point, first, we set out an argument making the case for wisdom as the central element of sagacity in a knowledge-based economy, and, second, offer policy guidelines for achieving sagacious innovation for socially intelligent change in knowledge-related policy. However, before explaining these central elements we must say what wisdom is.

Wisdom

Without wisdom, any social or economic system is deficient because of the power of wisdom to provide good judgement, perspicacity, and ethically applied knowledge. Yet knowledge about how to be wise, how to foster wisdom, and how to recognize it has been lost in the dominant discourses of the industrialized world.⁵ To rediscover knowledge about wisdom we must first know what it is. This brief outline elaborates our previous Western philosophical outline by briefly acknowledging an Eastern perspective. Essentially, wisdom is an ability to conduct oneself prudently and well, and to judge correctly and soundly by applying reason to putative 'fact' tempered by intuition and insight. Wisdom must be infused by ethical judgment and is directed to soundly based practical outcomes. Wisdom is founded on enlightenment, learning, erudition, deep understanding, and is avowedly ethical. Our definition, therefore, focuses on the quality, goodness, and soundness of decisions and judgments that are necessary for wisdom. Our view of wisdom, because it becomes most salient when deciding and judging in practical affairs is different to folklore and religious notions of wisdom, though we admit their usefulness: the first because it is necessarily shallowly didactic and the second because it emphasizes unworldly and esoteric sagacity. Our view of wisdom is secular because worldly wisdom must be based on sound knowledge, must be reasonable and balanced, must be ethical, and must result from humane and experienced understanding.

Because wisdom was well understood in ancient and medieval times by leading thinkers, we follow Lambertson⁶ who drew on ancient insights about knowledge, to help ground our understanding of wisdom. Several exemplary ancient philosophers and philosophical texts from China (*I Ching*) and Islam (Avicenna), affirm our fundamentally Aristotelian conception of wisdom.

Chinese philosophy is often characterized by its practical nature because it focuses on the practical task of social organization. The ancient and highly influential sacred Chinese text, *I Ching*, written between 450 and 350 BC, deals with perspicacity, leadership and wise decision-making.⁷ The book clearly identifies the qualities such as humility, correctness, virtue, proper dealing, dignity, sincerity, and a sense of balance as central to wise decision-making. In relation to balance, the *I*

Ching argues that a balance of left and right, feminine and masculine, day and night, and other polarities is fundamental to good living. These are not opposites, but complements. Each completes the other.

The great Persian philosopher, Avicenna (980AD–1037AD), developed a view of knowledge that is centred on wisdom. Avicenna, through questioning, teaching, reflection and observation devised a four-level heuristic for understanding prophethood (or wisdom and perspicacity): intellect, imagination, miraculous, and practical. For Avicenna, the intellectual is a composite of intuition, active intellect, and humanness. The imagination transforms conceptual images into real-life images. The miraculous is power over the material domain (nature). The practical includes socio-political skills—the ‘statesman’, the ‘law-giver’—and comes from implementing insight, morals, and intellectual concepts.⁸ Avicenna describes an intellectual domain that is ‘philosophical’, indeed moral, rather than ‘scientific’ but which nonetheless provides a realistic, broad-based, and practical basis for thinking about wisdom and the application of knowledge generally. There is no separating the practical from the moral, the intellectual, or the imagination.

These ancient ways of thinking about appropriately applying knowledge characteristically have an intellectual breadth and scope of social vision. The line between thinking ‘scientifically’ and thinking humanistically is not drawn: both ways are embraced to form a single system of knowledge, thought, judgement and intuition.⁹ To better penetrate such ancient epistemologies we turn to Aristotle who most eloquently describes the details of what wisdom is and how it operates in a social or knowledge system.

Underpinning all of Aristotle’s philosophy, including his theory of practical wisdom, is his position that one should be ‘doing what one does just because one sees those actions as noble and worthwhile’.¹⁰ Put another way, people should be ‘living life according to the moral virtues’.¹¹ While there are ethical virtues, such as generosity and temperance, a fully developed person also requires intellectual virtues such as wisdom, intelligence and prudence.¹² For Aristotle, wisdom, therefore, is linked to intellect, which includes rationality and science knowledge [*sophia*], and technique [*techné*], character, integrity and ethics. However, the ingredient that enables these qualities to combine as a system is *nous* or common sense founded on insight, intuition, imagination and creativity. Because it is practical and worldly, Aristotle’s conception of wisdom is relevant to social policies and applications of knowledge-based economies. The worldliness of an Aristotelian approach to wisdom distinguishes it from an increasingly esoteric Medieval Catholic view¹³ of wisdom and the utilitarian early-modern Protestant (in particular, Puritan) views of knowledge that de-emphasize *nous* and assume a divine order. What separates Aristotle from non-secular views of wisdom is his worldliness: that is, his is a humanistic, not a religious philosophy. For Aristotle the capacity for good judgment comes from a well-formed humanity.

Thus, Aquinas represents a suitable historical marker for the time when the ancient Western construction of practical wisdom was appropriated into theistic discourse, which then bifurcated during the Reformation. The Thomistic orientation remained unworldly in the Catholic tradition that steadfastly opposed modernism even into the twentieth century when in 1907 Pope Pius X issued the encyclical *Pascendi Dominici Gregus* denouncing modernism. According to Toulmin,¹⁴ from the 1650s in European thought the practical world (*via activa*) increasingly detached from the world of reflection (*via contemplativa*). While this is true, we argue that the Protestant orientation adopted a utilitarian and consequentialist ethic (cf. a

Catholic deontology), embraced the Enlightenment with the instrumental logic of an emerging scientific method, and adopted the commercial practices necessary for the emergence of industrial capitalism. As a result, Aristotelian knowledge of what practical wisdom is and how to achieve it was gradually diminished in the Western intellectual tradition.¹⁵ We do not argue that wise decision-making was lost, but that a deeper understanding of the nature of practical wisdom faded under the hegemony of Cartesian rationalism and scientific method that supplanted, often to good purpose, the faith tradition and secular superstition. Thus, not only was knowledge of practical wisdom lost, but also the language needed to discuss wisdom in those terms, as was the desire to acknowledge its value. In short, we contend that the instrumentalism and the rationality of this Enlightenment tradition re-established the practical virtues of *techné*, but failed to heed Aristotle's call for practical wisdom as the supreme virtue, thereby consigning wisdom principally to esoteric spiritual discourses and folklore aphorisms.

It is important to emphasize that Aristotle's concept of wisdom is not antithetical to modern rational intellectual endeavour, including knowledge economy policy; indeed, his humanism called for science and reason to be applied to any problem. He asserted that wise actions must be:

- (1) scientific to the extent that a wise person understands 'both the fact and the reason for it combining intuition and scientific knowledge',¹⁶
- (2) more than a mere application of *techné*;
- (3) meta-analytical; a person 'must not only know what follows from the principles, but also possess truth about the principles',¹⁷
- (4) founded on humane ethics.

Thus, wise thinking is rational, intuitive, ethical, and capable of meta-analytical reflexivity. Paradoxically rather than contradictorily, wisdom explicitly combines intuition and scientific method, the particular and the general, and truth and scepticism. This is because unscrutinizable or transcendent cognitions such as intuition must complement the rigour of reason and scientific application (what we call the Aristotelian *techné*) to provide intelligent and ethical solutions to real-world problems.

While knowledge-based economic discourse is comfortable with the *techné* component of wisdom, it appears less confident in dealing with *nous* (unscrutinizable and transcendent cognitions) and ethics, which we argue should be central to innovation and socially intelligent change. For this reason it is useful to examine a point that Aristotle made which seems counter-intuitive to the modern mind conditioned to the strictures of scientific rationality. Aristotle argued that *nous* 'is concerned with the ultimate particular ... [It is] of definitions, for which there is no reasoning'¹⁸ because it 'is the insightfulness that makes up for the imprecision of rationality'.¹⁹ Aristotle rejects the values and assumptions of scientific rationality insofar as they affect a disdain for *nous* because of its non-rational basis. For Aristotelians the argument that rationality is the essence of precision and, indeed, is the only way to create knowledge is, therefore, an impoverished epistemology. What distinguishes Aristotelian epistemology from that of the rationalists' is not the rejection of reason, or science, but the active embracing of such a broad epistemology, one that covers a spectrum from *nous* to scientific rationality (*techné*).

We do not need to argue here the case against the inherent weaknesses of a rationalist scientific method. Dewey²⁰ explained the mutability of knowledge and

argued against the separation of 'higher' (theoretical) knowledge and 'lower' (practical) knowledge. For him, knowledge is disclosed in practical action. Popper's neo-Humean concerns with falsifiability²¹ have been built into mainstream hypothetico-deductive methodologies. Mainstream epistemology and the philosophy of science have incorporated Kuhn's²² notions of paradigms. By the time that Lakatos²³ amalgamated Kuhn and Popper in his influential philosophy of science, positivistic science clearly could no longer refuse to adapt. Outside the realm of science, poststructuralist theory and postmodern theory have reinforced the untenability of positivist science. For example, Foucault's poststructural theory of knowledge is now also well ingrained in contemporary epistemology. The shattering of established taxonomies and the periodization of epistemic structures; epistemic discursive formations; the disjunction between knowledge and truth; and the disciplinary techniques for maintaining orthodoxy²⁴ have now worked their way into contemporary epistemological discourse, virtually making hardline positivism in scientific processes impossible. Similarly, postmodern theorists such as Richard Rorty²⁵ see truth as an agreement among members of a community, and certainly not to be taken from 'a God's-eye point of view: no skyhook provided by some contemporary or yet-to-be-developed science, is going to free us from the contingency of having been acculturated as we were'.²⁶ Thus the social conditions affect the individual's beliefs.²⁷ The consequence of these developments is that positivistic scientific approaches characterized by rationality and factual knowledge have been superseded by concepts such as communities of practice²⁸ where meaning and processual methods are negotiated. A new pragmatic constructivism is now common in social science epistemology.²⁹

When 'scientific method' is applied to the social sciences, these epistemological concerns are even more important, and less tenable. Of course, the most significant non-technical contributory discipline to the discussion of knowledge economy is economics. Contemporary political discourse is now largely dominated by neo-classical economics within a neo-liberal framework.³⁰ Ideology and epistemological assumptions are almost impossible to separate in such discourses.³¹ One principal assumption is, of course, the concept of *homo economicus*, which fails to take into account fundamental features of human existence such as family, emotion, sentiment, and love. The capriciousness of inbuilt ideological suppositions is evident in the way that orthodox micro-economics shed the potentially ethical human that Adam Smith had originally envisaged, replacing him/her with a non-ethical being unaffected by sentiment, and that it overlooked his delineation of moral and natural philosophy. Instead, maximizing utility remains as neoclassical economics foundational assumption about human nature.³²

Having now established the case against the possibility of a purely rational, positivist consideration of the knowledge economy, we turn our attention to recent calls to urgently re-evaluate the importance of such unscrutinizable cognitions and particularly tacit knowledge in the context of technological R&D, and knowledge management.³³ Needless to say, a similar imperative exists in relation to knowledge-based economies and innovation. We assert that the case already exists to apply the tenets of Aristotelian wisdom to the most complex knowledge creation processes in contemporary times.

Aristotle's position is supported by the evidence from consciousness studies and the history and philosophy of science that uphold the claim that for all of human history, intuition, insight and other enigmatic or tacit aspects of intellection have been essential to the creation of knowledge.³⁴ The most recent developments in

superstring theory, for example, rest on concepts that negate post-Newtonian notions of time and space, a logical development of the Einsteinian process. Indeed, an advanced form of superstring theory is M-theory where M stands for 'magic, mystery, or membrane' according to superstring theorist Edward Witten in *Physics Today*.³⁵ In other words, the most significant advances in theoretical physics are occurring with the considerable accommodation of speculation and uncertain knowledge. Indeed, for Gebser³⁶ the enigmatic is the very pillar on which human cognitive systems have depended since the beginning of our evolution. Similarly, as Campbell³⁷ has pointed out, tacit intellection has been an essential survival talent for the greater part of human evolution, during most of which there were no codified languages or systematic epistemologies that could be used to rationally create knowledge and to learn. Such enigmatic cognitions are in large part transcendent, and unscrutinizable processes that re-form relationships between ideas or memories to create knowledge and decide in the absence of rational, specified methods and precise language. From a cognitive psychological perspective, intuitive judgment would most likely be seen as the outcome of schema, or organized knowledge structures,³⁸ or 'packets of information stored in memory representing general knowledge about objects, situations, events, or actions' that guide procedures, context information, and strategies of problem-solving.³⁹ Indeed, recent studies of brain function and its relationship to consciousness confirm that an overwhelming amount of what our brains do is done subconsciously and cannot be regarded as deliberate rationalism.⁴⁰ Over time, cognitive relationships linking past, present and future with our feelings, emotions and fantasies allow imagination and foresight to develop.⁴¹ Thus, intuition incorporates fantasy-rich constructions that are important to creativity and innovation. However, in the epistemology of the rationalist, empiricist scientific tradition (if not in the practice of science), hypothetico-deductive method, direct observation, and calculation are privileged and its values deeply embedded in dominant public epistemic discourse (including discourse on information, knowledge management, innovation and knowledge-based economies) to the detriment of the transcendent and the wise in Aristotle's sense.⁴²

Importantly, the value of wisdom arises out of its ability to assist us in overcoming the discontinuity of and aporia in our knowledge and apprehension of reality that is brought about by the impossibility of completely understanding it. There is, therefore, a tension between the rationalist intellectual values of industrial modernity and technocracy on the one hand, and reality and the humanistic ethos of Aristotle's epistemology on the other. Although wisdom cannot be generated only by rational and mechanical means it can be developed provided there is an appropriate disposition. However, while wise people will use 'hard' data and rational process as part of their decision-making, the process that produces wise counsel and decisions must also be subjective to the extent that it is humane, creative, and, in that it is reflexively and thoughtfully built on experience and insight.⁴³ In other words, must be socially intelligent. Thus, the subjective and intersubjective are important in understanding how wisdom comes into being and how it might be viewed at the level of practice. An important aspect of this in knowledge-based economies is reflexive practice.

Reflexivity

We claim that reflexivity is a crucial element of wise practice because it embodies the crucial features of good judgment, including awareness of one's own subject

position, and 'the socially laded rather than socially determined'⁴⁴ view of knowledge. However, the concept of reflexivity is polysemic and, dare we suggest, in danger of becoming yet another fad term wrung free of its crucial characteristics. The concern with reflexivity emerged 'from a confluence of theoretical and methodological concerns'⁴⁵ in the social sciences, rather than as an aspect of managerial practice. Among the most significant writers, Pierre Bourdieu,⁴⁶ was deeply concerned to develop a reflexivity 'as a means of developing richer descriptions of the social world but also as the basis for a more practically adequate and epistemologically secure social science'.⁴⁷ While it is true that discussions about reflexivity are primarily concerned with social science research methodologies, their concerns are still very useful in developing a grounded theory of, for example, organizational or management wisdom.

Reflexivity is not meant here as simply organizational learning, as though appropriate learning were the inevitable outcome of an organization that claims to have organizational learning processes in place.⁴⁸ In particular, such systems approaches are oriented to error correction and adaptation to environmental changes.⁴⁹ Rather, organizational theory is now incorporating the embodied and the aesthetic dimensions of organizational learning.⁵⁰ As well, Lave and Wenger have long ago reminded us of the situatedness of communities of practice that reproduce their knowledge and knowledge processes.⁵¹ In other words, the type of reflexivity that a wise organization needs is a constitutive reflexivity that interrogates the practices for producing knowledge⁵² in the manner that Woolgar has advocated.⁵³

Reflexivity is essentially concerned with considering the way in which we think and what we consider to be true in the light of what we have just done and its outcomes. Vygotsky draws our attention to the social connectedness of the evolution of thoughts: 'Every thought tends to connect something with something else, to establish a relation between things. Every thought moves, grows and develops, fulfils a function, solves a problem'.⁵⁴ In this way, the social and cultural history of our engagement with the world is held in consciousness and subconsciousness too, as well as in the practices in which we engage.

It is this social and evolutionary aspect, as well as the epistemology, the language, the subject positions, and the community practices that most concerns reflexive consideration. Although applied to management and organizational meta-theory, Alvesson *et al.*⁵⁵ provide useful understandings about reflexivity dealing with these concerns that can be applied to any reflexive practice. In particular, they identify multiple forms of reflexivities:

- a. destabilizing postmodern and poststructural approaches directed to revealing the ambiguous, fragmented and contested nature of epistemology;
- b. multi-perspective approaches directed to seeking out anomalies among vocabularies, theories, interpretations and frames to produce a bricolage;
- c. multi-voicing approaches that understand the researcher as a subject influencing the perception of the object;
- d. reflexivity as a positioning practice acknowledges the knowledge and practice of the researcher's own research community.

Usefully, the authors distil this into D and R types of reflexivity.⁵⁶ D-reflexivity tends to be negative in that it subverts practice by deconstructing, declaiming, destabilizing, and danger warning. By contrast, R-reflexivity is more positive

because it reconstructs, re-frames, reclaims, and re-presents, illuminating what is left out and marginalized.

Consistent with the understanding that wisdom is practical, reflexivity too, as a characteristic of wisdom, should be practical in the sense that it is directed to producing something 'better': 'more creative, offering a broader set of ideas/interpretations, more ethically informed or sensitive or avoiding getting caught by the social conventions or fashions'.⁵⁷ We agree with Alvesson *et al.* that the more positive R-reflexivity will avoid Weick's⁵⁸ concern that reflexivity can induce a paralysing regress of doubt, or what Maton⁵⁹ calls hermeneutic narcissism. Consequently, we would define reflexivity as an aspect of wise practice that:

- acknowledges the ambiguous, fragmented and contested nature of knowledge, but does not let that prevent a determination of the understood 'facts' in a matter;
- acknowledges that there are multiple perspectives to any phenomenon, each with their own vocabularies, theories, interpretations and frames;
- understands as far as possible one's own subject position individually and as a member of a community of practice, and that this will influence the perception of the object.

We believe that these principles of reflexive practice will provide more creative thinking that should provide more and broader ideas and interpretations; that the thinking will be ethical because of its openness intellectually, emotionally, and physically to other standpoints; and that will be less vulnerable to ephemeral conventions that regulate orthodoxy.

What has been posited so far is a process. Although knowledge of the matter for judgement is vital, it need not be full, expert knowledge. While a manager or shareholder may not have the complex and thorough financial knowledge of a corporate accountant, they have a fiduciary responsibility to understand potentially imprudent or unethical practices. For example, the substantial knowledge required to create the dotcom industry in the 1990s, was profoundly undermined by the lack of wise and prudential financial leadership that caused the dotcom crash. Members of the industry did not hold the memories and understandings, and could not deploy the imagination, insight or judgment needed to foresee the crash and neither were they inclined to comprehend the ethical dimensions of their situation. A wise and prudent approach would have displayed attention to detail and used meta-analytical technique⁶⁰ rather than responding to the flood of obvious share price boom information; it would have also displayed concern or care⁶¹ for the savings of people seeking to invest for income and security. Indeed, George Soros laments the absence of reflexivity in US high finance. Addressing the MIT Economics Department in 1994, he spoke of his 'theory of reflexivity which has guided me both in making money and in giving money away, but has received very little attention from anybody else'.⁶² This approach would focus on particular stimuli to concentrate thought in a way that activates relevant memories and emotions providing clarity, balance, and soundly-based confidence. Attention and concern are keys to higher knowing because they allow us access to our higher mental states, and ethical frameworks that are complex and flexible networks of interpreting and understanding.⁶³ By contrast, the predominating emphasis on creating knowledge (and innovation) at faster and faster rates—the 'politics of urgency'—produces an almost autistic inability for reflection and consideration.⁶⁴

There are particular kinds of foundational knowledge that are required for this kind of reflexivity: knowledge of ethics and values, historical knowledge, cultural knowledge, social knowledge, self-knowledge and communication know-how, all of which conform to Aristotle's position.

The Savant, the Fool, the Ignoramus and the Wise Person

Keeping the above discussion in mind, Giambattista Vico, an eighteenth century Aristotelian, provides an effective—and timeless—taxonomy of four intellectual types that can be applied just as well to commercial, governmental and institutional managers, and professionals dealing with the technical, economic, legal and administrative complexities of contemporary life. These four intellectual types are:

- The imprudent savant (*doctus imprudentis*) 'approaches ethics as though it were a manual of propositions to be memorized'; makes decisions slowly, is arrogant; and has a lack of persuasive communication. The savant moves 'in a straight line from general to particular truths' in order to 'burst through the tortuous curves of life'.⁶⁵ Sometimes successful, they more often fail.
- The fool (*stultus*): 'lacks knowledge of either the general or the particular', and so 'constantly pays for his [or her] rashness'.⁶⁶
- Although the astute ignoramus (*illiterates astutus*) knows how to succeed in worldly affairs, s/he lacks phronesis [reflexive humane wisdom]. Thus ignorance of the most important things, as evidenced by constantly preferring utility over what is right, ensures failure in the most important matters.⁶⁷
- Because wise people (*sapientes*) have practical and theoretical wisdom, 'through all the obliquities and uncertainties of human actions, [they] aim for eternal truth, follow roundabout ways ... and execute plans which in the long run are for the best, as far as the nature of things allows'.⁶⁸

Vico was responding to what Benedict characterizes as the 'New Science' and its lack of regard for Aristotelian logic, and its unbalanced esteem for experiment and demonstration.⁶⁹ The lineage of this New Science, technocratic rationality in business, government and education (managerialism, economic rationalism and utilitarian credentialism) are the domains of Vico's imprudent savant and astute ignoramus. It is obvious that Vico would not suggest we adopt the values of either of these actors, nor of the fool. He would urge us to choose the path of the wise. Scaled up, neither should knowledge-based economies or knowledge societies embed the values of the imprudent savant, the fool or the astute ignoramus in their cultures because they are not characterized by the thoughtfulness needed for reflexive, humane, and wise societies.

In knowledge-economy discourses the savant or ignoramus would espouse that its principles of action be driven by scientific knowledge and technology, fuelled by observable, explicit data and method rather than also with wisdom, virtue and insight. It is of concern, then, that empirical analysis of a corpus of international knowledge-related policy discourse suggests this has already happened.⁷⁰ Moreover, despite the great edifice of rationality and scientific certitude modern industrial societies are often assumed to be built on, they are, according to Van Loon, full of uncertainty and are caught in a logic of infinite regress that says: 'More uncertainty demands more knowledge, more knowledge increases ... complexity, more complexity demands more abstraction, more abstraction

increases uncertainty'.⁷¹ This concatenation leads to the anxiety of ambivalence and the social neuroses induced by the instrumentalist quest for certainty. These conditions are not sagacious, so a proper knowledge society should demand more.

The alternative that we propose from a humanist perspective is to adopt wisdom as a necessary feature of effective knowledge policy and knowledge societies. We support Zald's endorsement of the significant role that the humanities has in bringing 'into view' the most complex areas of intellectual life.⁷² Knowledge imparted in the humanities is given greater emphasis because knowledge, values, and ethics are intimately connected. Knowledge has to be used creatively, responsibly, and well.⁷³

Taking this line of argument a step further, Varela poses an interesting epistemological challenge to science:

[E]very good student of cognitive science who is also interested in issues at the level of mental experience, must inescapably attain a level of mastery in phenomenological examination in order to work seriously with first-person accounts ... To the long-standing tradition of objectivist science this sounds like anathema, and it is. But this is not a betrayal of science: it is a necessary extension and complement. Science and experience constrain and modify each other as in a dance. This is where the potential for transformation lies.⁷⁴

Varela is in effect arguing for an epistemic broadening of the scientific method. In a similar fashion, Combs argues that:

[Truth] requires more than data and hard logic, and even more than intuition. It requires a balancing act that at once clings to the best that science has to offer while all the time holding a reverence for traditional wisdom, knowing that the truths of science change daily while traditional wisdom is so deeply steeped in metaphor that its foundations are often obscure.⁷⁵

The challenge we face in revalorizing wisdom is one of integrating the general and the particular, rationality and intuition, data and values, and so on to create a different intellectual culture for knowledge societies. Without pointing to some redemptive, idealistic teleology we assert that by continually realigning towards virtue through continuous processes of critique and reflexive practice, governance processes for institutions and society are more likely to produce worthwhile outcomes than those that ignore or eschew such things.

Probably the best-known theorist who unashamedly espouses a humanitarian teleology is Habermas. While we consider the idealism of his project somewhat problematic,⁷⁶ his theory of communicative action provides some useful guidelines about the types of practices that should infuse a wise, reflexive, democratic knowledge-based economy and to assess claims about what should constitute public goods in such a community. In *Theory of Communicative Action* Habermas proposes that reasoning founded on individual subjectivity and the intersubjectivity of societal interactions is a valid complementary element of human judgment to the objective cognitive-instrumental reason of technocratic society.⁷⁷

The value of Habermasian concepts to the Aristotelian-wisdom tradition is that it admits subjective and intersubjective reasoning to human judgment, without rejecting the value of the cognitive-instrumental domain of technical knowledge. Aristotle differentiated between the pragmatic application of technique (*technê*),

the ‘ability to think well about scientific subjects’ (*sophia*), and also ‘the habit of being good at thinking about practical matters’ (*phronesis*).⁷⁸ In a sense, Aristotle’s concept of *nous* (insight and intuition) could in the discourse of epistemology be called meta-theoretical analysis; that is, to have an awareness of the truths that inform the major premises of a ‘fact’ or an ‘axiom’. In other words, like Habermas, Aristotle understood the constitutive nature of knowledge, and more particularly the importance of this meta-theoretical critical capacity in leadership. Such humanist re-orientation in our leadership would therefore reassert the ‘life-world’ (the human) alongside the ‘system world’ (the technological).

The time has come in modern practice, we argue, for a form of wisdom-based humanism that avoids the extremes of positivist pseudo-science and the entropic tendencies of postmodern theorizing, though the former is more in evidence than the latter. We would endorse Toulmin’s hope for a ‘modern’ revival of Renaissance humanism: ‘a reintegration of humanity with nature; a restoration of respect for Eros and the emotions; effective transnational institutions; a relaxation of the traditional antagonisms of classes, races, and genders; an acceptance of pluralism in science; and a final renunciation of philosophical foundationalism and the quest for certainty’.⁷⁹

The Wisdom Tradition as an Influence on Policy

Having articulated what wisdom is and why it is both practical and necessary the question remains, how might this knowledge of wisdom be deployed at the level of practice? For example, what would ‘being wise’ mean for a government committed to innovation that will bring about a better quality of life? Space limitations prevent us from entering into a wide-ranging discussion on this topic so we will provide five simple criteria of wisdom in practice based on our analysis.

1. There must a technical understanding of the phenomenon under analysis (*technê*).
2. However, there must be more than mere application of *technê*. There needs to be a contextual understanding of the phenomenon within the conditions of its existence (e.g. understanding the Challenger disaster within the context of administrative processes, not just as the failure of an O-ring).
3. A wise policymaker would question the assumptions, truth-value and construct- edness of underlying and surrounding propositions. One ‘must not only know what follows from the principles, but also possess truth about the principles’.⁸⁰ This is the skill of meta-analysis and is perhaps the hardest of these criteria to meet.
4. A wise person would combine insight, intuition and scientific knowledge, understanding the contingency of life and the inevitability of unintended consequence.
5. An inevitable and irreducible concern for ethical implications and the better- ment of society for all.

In applying these criteria to governmental considerations for the planning and management process of an innovation system, the following things might be considered. First, a government would need to understand the economic, technical, engineering and scientific bases of any innovation that is proposed by accessing the best knowledge available. However, the government would ‘read’

their accumulating knowledge through the lens of various social, cultural, political, ethical and other dimensions that must be anticipated and defined. Thirdly, a government would want to know more about why various innovations are considered worthy or, indeed, virtuous. For example, universities' dependence on competitive research might affect their 'scientific objectivity'. Fourth, given the rapid rate of change as well as the timeless truth that all things bring unintended consequences, a government would want to set up mechanisms to track, evaluate, and respond to the inevitable mutations, and also to the ancillary people, practices, and processes that such a phenomenon would produce. This inevitably means that government remains independent and does not privilege or valorize any particular interest group. For example, in-vitro fertilization [IVF] was developed as a solution for infertile couples seeking children. This having been established, a new set of claims based on 'rights', accesses to the technology for lesbian couples and the possibility of 'designer babies' alters the original intent and creates a new set of expectations. Finally, given that all the above has been done and understood, an ethical stance must be developed and applied throughout the entire process. In other words, government should be seen to bring about socially intelligent change, indeed, social innovation that will resist the embedding of savant-like tendencies in a knowledge-based economy.⁸¹

While the concerns expressed in this criteria are largely self-evident to the reflexive person, they are not privileged in the dominant knowledge-based economy discourse which we have shown elsewhere to have deeply entrenched instrumental and anti-social sentiments.⁸² It is the discourse of the technical savant rather than the sage. Subsuming knowledge-based economy or, rather, knowledge society discourse (and policy) within the interests and imperatives of a technocratic elite is also short sighted, exclusionary and undemocratic.⁸³

Wisdom, Democracy and Social Responsibility

A society that incorporates the wisdom tradition when dealing with knowledge also enhances the democracy of our age by diminishing technocratic control. That is, such a process allows us to reproduce and generously communicate and negotiate change and innovation that enhances social interaction and social integration. Such conditions simultaneously preserve and renew effective norms and cultural knowledge establishing cohesion while also negotiating new assumptions, norms, and knowledge. Such a process enables communities and individuals to adapt to changed conditions,⁸⁴ but this will not happen effectively in an unempathetic, technocratic, and wisdomless policy environment.

This process also places responsibility on all community participants, not just its leaders. Knowers must be responsible for their knowledge and for knowing well.⁸⁵ Everyday living as members of a community involves epistemological considerations that bring knowledge and responsibility together; we all have, for example, a responsibility to know the spirit of the law and we all have a responsibility to know how to act in relationships.⁸⁶ To know well means that we understand how values affect what we can do and know: 'we come to know what we care to know'.⁸⁷ Furthermore, we need to know that knowledge is constructed within epistemic frameworks that are shaped by dialogical and dialectical discursive processes taking place within particular spatio-temporal conjunctions. We have to care about what we claim to know or believe; the unempathetic indifference of a savant is epistemic irresponsibility.⁸⁸ To this end, von Krogh *et al.* are emphatic that caring is central to

successful knowledge management practice.⁸⁹ What we care about motivates us to create, maintain, and share knowledge.⁹⁰ To care humanely requires empathy. An important question about the knowledge-based economy, therefore, how to value, in policy, empathy and its knowledge society correlates such as generosity of mind? In other words, what values drive us to be concerned? Are these the values of the technocrat savant or something better? While not collapsing into the disabling postmodern trap of epistemic relativism, 'good knowing' must be able to operate at a meta-knowledge level: know its constructedness and its axiomatic basis, but still be able to act with certitude. The wisdom of the sage works at this level (as well as other levels). There is also a natural fit with democracy that the scope of view of the sage has that caters to a broader range of social and economic interests than does the savant view.

Conclusions

For individuals, achieving complete wisdom is, of course, difficult and likely impossible, and knowing how to be wise is not any less difficult because it encompasses some enigmatic intellectual qualities. For the same reasons, the challenges at the macro social level are likely to be even greater. Yet the value of wisdom arises out of its ability to assist us to overcome the discontinuity of our rational knowledge of reality. It is integral to practical knowing because it is precisely wisdom and its enigmatic qualities that allow us to make sense of a difficult reality and to make good *judgments* about how to cope with that imperfectly knowable reality. Moreover, we have also shown that knowledge and values are intimately connected. Knowledge has to be used creatively, responsibly and well. Tacit and explicit knowledge, reflexive intuition, and values are connected.

In the practical world, we acknowledge that at, say, the engineering and construction project management level, practice is sensibly informed by intelligent software systems, calculus and so on. We have already identified the place for this (*techné*) in any wise practice. However, prudent practice operates in a wider system of knowledge, values, and human telos that needs to be wisely determined and continually negotiated humanely and ethically. Such practices include knowledge-based economy policy formulation.

Central to our argument is that industry and policy level discourse about and for a knowledge-based economy must not lose sight of the imperatives of the social, ethical and cultural underpinnings of knowledge work. These imperatives include equity (gender, age, racial, disability, etc.), environmentalism, ethical trust and responsibility. It is difficult to over-estimate the importance of such considerations. However, by treating them as side issues to instrumentally conceived economic, scientific and industrial policy they remain outside the dominating internal logic of technocratic rationalism, as just another factor to be bolted on to an inexorably moving machine.⁹¹ To act wisely and humanely will inevitably mean that producing and maintaining equity, the 'sacred balance' of the environment, and prudent, responsible practices are built into the daily lives of people in business and government.

Notes and References

1. D. Rooney, G. Hearn, T. Mandeville and R. Joseph, *Public Policy in Knowledge-Based Economies: Foundations and Frameworks*, Edward Elgar, Cheltenham, 2003.

2. P. Graham and D. Rooney, 'A sociolinguistic approach to applied epistemology: examining technocratic values in global "knowledge" policy', *Social Epistemology*, 15, 3, 2001, pp. 155–69.
3. B. M. Benedict, *Curiosity: A Cultural History of Early Modern Inquiry*, University of Chicago Press, Chicago, 2001; B. S. Cohn, *Colonialism and Its Forms of Knowledge: The British in India*, Princeton University Press, Princeton, 1996; and D. S. Landes, *The Wealth and Poverty of Nations: Why Some Nations are so Rich and Some so Poor*, Little, Brown and Company, London, 1998.
4. Vico in R. C. Miner, 'Verum-factum and practical wisdom in the early writings of Giambattista Vico', *Journal of the History of Ideas*, 59, 1, 1998, pp. 53–73.
5. Graham and Rooney, *op. cit.*; and D. Rooney and B. McKenna, 'Wise management: an evaluation of historical discourse on wisdom and ethical action', forthcoming.
6. D. M. Lambertson, 'The knowledge-based economy: a Sisyphus model', *Prometheus*, 15, 1, 1997, pp. 73–81.
7. *The I Ching*, 2nd edition, Dover Publications, New York, 1963.
8. I. P. McGreal, *Great Thinkers of the Eastern World*, Harper Collins, New York, 1995, pp. 541–2.
9. cf. D. Bohm, *Wholeness and the Implicate Order*, Routledge, London, 2000; and A. N. Whitehead, *Process and Reality: An Essay in Cosmology*, corrected edition, The Free Press, New York, 1978.
10. G. J. Hughes, *Aristotle on Ethics*, Routledge, London, 2001, p. 89.
11. *Ibid.*, p. 92.
12. Aristotle, *Nicomachean Ethics*, The Peripatetic Press, Grinnell, IO, 1984, Bk 6, 1:1103a, 4–6.
13. Medieval Catholicism increasingly moved away from the Thomistic–Aristotelian tradition towards a more dogmatic spirituality (cf. Aquinas' emphasis on a spiritually informed conscience) and affirming the centrality of sacramental redemption.
14. S. Toulmin, *The Return to Cosmology*, University of California Press, Berkeley, 1982.
15. Rooney and McKenna, *op. cit.*
16. See Apostle's (Trans.) note on Aristotle's Posterior Analytics in, Aristotle, *op. cit.*
17. Aristotle, *op. cit.*, Bk 6, 7: 1141a, 16.
18. *Ibid.*, Bk 6, 1142b: 9, 25–8.
19. J. Dunne, *Back to the Rough Ground: Practical Judgement and the Lure of Technique*, University of Notre Dame Press, Notre Dame, 1997, p. 15.
20. J. Dewey, *The Quest for Certainty: A Study of the Relation of Knowledge and Action*, Putnam, New York, 1929; see also J. Connell, 'Reconstructing a modern definition of knowledge: a comparison of Toulmin and Dewey', *Philosophy of Education Yearbook*, 1995, URL: http://www.ed.uiuc.edu/EPS/PES-Yearbook/95_docs/connell.html. Accessed 1 February 2005.
21. K. Popper, *The Logic of Scientific Discovery*, Hutchinson, London, 1959; K. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*, Routledge and Keegan Paul, London, 1963; and K. Popper, *Postscript to the Logic of Scientific Discovery: The Open Universe—A Case for Indeterminism*, Rowman and Littlefield, Ottawa and Hutchinson, London, 1982.
22. T. S. Kuhn, *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, 1970, p. 62.
23. I. Lakatos, 'Falsification and the methodology of scientific research programmes', in I. Lakatos and A. Musgrave (eds), *Criticism and the Growth of Knowledge*, Cambridge University Press, Cambridge, 1970, pp. 91–195. Lakatos was trenchantly critiqued by Alan Musgrave (1976).
24. M. Foucault, *The Archaeology of Knowledge*, Tavistock, London, 1972a; M. Foucault, *The Archaeology of Knowledge and the Discourse on Language*, Pantheon Books, New York, 1972b; and M. Foucault, *Discipline and Punish: The Birth of the Prison*, Penguin, Harmondsworth, 1979.
25. R. Rorty, *Philosophical Papers: Objectivity, Relativism and Truth (Vol. 1)*, Cambridge University Press, Cambridge, 1991.
26. *Ibid.*, p. 13.
27. We must emphasise that we do not adopt Rorty's advocacy of inquiry that simply furthers the solidarity of one's community, 'to reduce objectivity to solidarity' (*Ibid.*, p. 22).
28. E. Wenger, *Communities of Practice: Learning, Meaning and Identity*, Cambridge University Press, Cambridge, 1999.
29. R. E. Grandy, 'Constructivism and objectivity: disentangling metaphysics from pedagogy', in M. R. Matthews (ed.), *Constructivism in Science Education: A Philosophical Examination*, Kluwer,

- Dordrecht, 1998; and H. E. Longino, *The Fate of Knowledge*, Princeton University Press, Princeton, 2002.
30. H. Feigenbaum, H. Henig and C. Hamnet, *Shrinking the State*, Cambridge University Press, Cambridge, 1998; C. Hay, 'The crisis of Keynesianism and the rise of neoliberalism in Britain: an ideational institutionalist approach', in J. L. Campbell and O. K. Pederson (eds), *The Rise of Neoliberalism and Institutional Analysis*, Princeton University Press, Princeton, 2001, pp. 193–218; and L. Wacquant, 'How penal common sense comes to Europe: notes on the transatlantic diffusion of neoliberal doxa', *European Societies*, 1, 1999, pp. 319–52.
 31. B. J. McKenna and P. Graham, 'Technocratic discourse: a primer', *Technical Writing and Communication*, 30, 3, 2000, pp. 219–47.
 32. See J. Evensky, 'Adam Smith's lost legacy', *Southern Economic Journal*, 67, 3, 2001, pp. 497–517; and A. Sen, 'Rationality and social choice', *American Economic Review*, 85, 1995, pp. 1–24 for further critique.
 33. See for example Lambertson, *op. cit.*; I. Nonaka and H. Takeuchi, *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, 1995; and Rooney *et al.*, *op. cit.*; D. Rooney and T. Mandeville, 'The knowing nation: a framework for public policy in a knowledge economy', *Prometheus*, 16, 4, 1998, pp. 453–67; and G. von Krogh, K. Ichijo and I. Nonaka, *Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*, Oxford University Press, Oxford, 2000.
 34. A. Combs, *The Radiance of Being: Complexity, Chaos and the Evolution of Consciousness*, Floris Books, Edinburgh, 1995; Kuhn, *op. cit.*; M. Polanyi, *The Tacit Dimension*, Doubleday, Garden City, 1967; and S. Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England*, University of Chicago Press, Chicago, 1994.
 35. Quoted in R. Hendrick, 'Superstring theory and empirical testability', Centre for Philosophy and the Foundation of Science, Giessen, URL: <http://philsci-archive.pitt.edu/archive/00000608/00/superstr.doc>. Accessed 1 February 2005.
 36. J. Gebser, *The Ever Present Origin*, Ohio University Press, Athens, 1985.
 37. D. T. Campbell, 'Evolutionary epistemology', in D. T. E. Campbell (ed.), *Language, Development and Culture*, Wiley and Sons, New York, 1974, pp. 413–63.
 38. S. T. Fiske and S. E. Taylor, *Social Cognition*, 2nd edition, McGraw-Hill, New York, 1991.
 39. R. M. Turner, *Adaptive Reasoning for Real-World Problems*, Lawrence Erlbaum Associates, Hillsdale, NJ, 1994, p. 28. Also see G. Cohen, G. Kiss and M. Le Voi, *Memory: Current Issues*, 2nd edition, Open University Press, Philadelphia, 1993; and D. L. Morgan and M. L. Schwalbe, 'Mind and self in society: linking social structure and social cognition', *Social Psychology Quarterly*, 53, 2, 1990, pp. 148–64.
 40. G. M. Edelman and G. Tononi, *A Universe of Consciousness: How Matter Becomes Imagination*, Basic Books, New York, 2000.
 41. K. E. Boulding, *The Image: Knowledge in Life and Society*, University of Michigan Press, Ann Arbor, 1956.
 42. McKenna and Graham, *op. cit.*
 43. H. Mintzberg, *Managers Not MBAs: A Hard Look at the Soft Practice of Managing and Management Development*, Berrett-Koehler, San Francisco, 2004.
 44. K. Maton, 'Reflexivity, relationism and research: Pierre Bourdieu and the epistemic conditions of social scientific knowledge', *Space and Culture*, 6, 1, 2003, p. 61.
 45. K. D. Haggerty, 'Review essay: ruminations on reflexivity', *Current Sociology*, 51, 2, 2003, p. 196.
 46. P. Bourdieu, *In Other Words: Essays Towards a Reflexive Sociology*, Stanford University Press, Stanford, 1990; P. Bourdieu, *Science of Science and Reflexivity*, University of Chicago Press and Polity Press, Chicago, 2004; and P. Bourdieu and L. J. D. Wacquant, *An Invitation to Reflexive Sociology*, University of Chicago Press, Chicago, 1992.
 47. Maton, *op. cit.*, p. 53.
 48. For example C. Argyris and D. A. Schön, *Organizational Learning: A Theory of Action Perspective*, Addison-Wesley, Reading, MA, 1978; P. M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday Currency, New York, 1994.

49. A. Contu and H. Willmott, 'Knowing in practice: a "delicate flower" in the organizational learning field', *Organization*, 7, 2, 2000, pp. 269–76.
50. Cf. D. Yarrow, 'Seeing organizational learning: a "cultural" view', *Organization*, 7, 2, 2000, pp. 247–68.
51. J. Lave and E. Wenger, *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press, Cambridge, 1991.
52. K. Campbell, 'The promise of feminist reflexivities: developing Donna Haraway's project for feminist science', *Hypatia*, 19, 1, 2004, p. 162.
53. S. Woolgar, 'Reflexivity is the ethnographer of the text', in S. Woolgar (ed.), *Knowledge and Reflexivity: New Frontiers in the Sociology of Knowledge*, Sage, London, 1998.
54. L. Vygotsky, *Thought and Language*, MIT Press, Cambridge, MA, 1986, p. 218.
55. M. Alvesson, C. Hardy and B. Harley, *Reflecting on Reflexive Practices in Organization and Management Theory*, Lund Institute of Economic Research, Lund, 2004.
56. *Ibid.*, p. 16.
57. *Ibid.*, p. 18.
58. K. E. Weick and K. H. Roberts, 'Collective mind in organizations: heedful interrelating on flight decks', *Administrative Science Quarterly*, 38, 1993, pp. 357–81.
59. Maton, *op. cit.*
60. Combs, *op. cit.*, pp. 237–9.
61. L. Code, *Epistemic Responsibility*, Brown University Press, Hanover, 1987; and S. P. Stafford, 'Epistemology for sale', *Social Epistemology*, 15, 3, 2001, pp. 215–30.
62. G. Soros, 'The theory of reflexivity by George Soros', MIT Department of Economics, Washington, DC, 1994, URL: <http://www.geocities.com/ecocorner/intelarea/gsl.html>. Accessed February 2005.
63. Combs, *op. cit.*; and R. E. Ornstein, *The Psychology of Consciousness*, Penguin, Harmondsworth, 1977.
64. J. Van Loon, *Risk and Technological Culture: Towards a Sociology of Virulence*, Routledge, London, 2002, p. 5.
65. Miner, *op. cit.*, p. 57.
66. *Ibid.*, p. 56.
67. *Ibid.*
68. *Ibid.*
69. Benedict, *op. cit.*, p. 27.
70. Graham and Rooney, *op. cit.*
71. Van Loon, *op. cit.*, p. 41.
72. M. N. Zald, 'More fragmentation? Unfinished business in linking the social sciences and humanities', *Administrative Science Quarterly*, 41, 2, 1996, pp. 251–61.
73. Code, *op. cit.*; Stafford, *op. cit.*
74. F. J. Varela, 'Neurophenomenology: a methodological remedy for the hard problem', *Journal of Consciousness Studies*, 3, 4, 1996, p. 14.
75. Combs, *op. cit.*, p. 14.
76. See for example C. Calhoun, 'Introduction', in C. E. Calhoun (ed.), *Habermas and the Public Sphere*, MIT Press, Cambridge, MA, 1992.
77. J. Habermas, *The Theory of Communicative Action. Vol. 1. Reason and the Rationalization of Society*, Heinemann, London, 1984; and J. Habermas, *The Theory of Communicative Action. Vol. 2. Lifeworld and System: A Critique of Functionalist Reason*, Heinemann, London, 1987.
78. Hughes, *op. cit.*, p. 87.
79. Connell, *op. cit.* See also T. A. J. Spragens, 'Is the enlightenment project worth saving?', *Modern Age*, 43, 1, 2001, pp. 49–60.
80. Aristotle, *op. cit.*, Bk 6,7: 1141a, 16.
81. Rooney *et al.*, *op. cit.*
82. Graham and Rooney, *op. cit.*
83. D. Rooney, 'Knowledge, economy, technology and society: the politics of discourse', *Telematics and Informatics*, 22, 4, 2005, pp. 405–22.

84. Rooney *et al.*, *op. cit.*
85. Stafford, *op. cit.*
86. Code, *op. cit.*
87. Stafford, *op. cit.*
88. S. Baron-Cohen, *Mindblindness*, MIT Press, Cambridge, MA, 1995.
89. von Krogh *et al.*, *op. cit.*
90. Stafford, *op. cit.*
91. Rooney and Mandeville, *op. cit.*