

# To Be Scientific or to Advocate Scientism: That Is the Question\*

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How is the significance of the doctrine Scientism to be understood? To answer that question, it will be necessary to distinguish three stances towards scientific activity. This can be done by developing distinctions already delineated between Relativistic, Methodological and Dogmatic Scientism. In the present paper, the first two senses are best characterized as the scientific: Scientific Relativism and Scientific Methodologism. Dogmatic Scientism arises in two forms: a Janus-faced Scientism and an Essentialist form. The former can be understood as advocating a public tolerance of behaviourism in relation to other people's responses, cast as spatio-temporal events whilst adopting, at the same time, a private existentialism so that one's own first person evaluations remain valid. An Essentialist form sustains a predictive and normative stance where any human action or communication is cast as "a natural object of investigation of the empirical sciences". After distinguishing these four ways of interpreting scientific activity, Ladyman and Ross's own contribution to this debate can be elucidated through examining five theses carried by their text *Every Thing Must Go*, and ideas forwarded subsequently in Ladyman's article "Scientism with a Humane Face": (1) the attack upon conceptual analysis; (2) the defence of metaphysics; (3) the advocacy of scale relative ontology; (4) the rehabilitation of Peirce's philosophy; and (5) the rejection of a traditional conception of materialism. It may then become possible to ascertain how far their approach to scientific activity can be identified with either a Scientific Methodologism or some form of Scientism itself.

*Keywords:* relativism, scientific, scientific, scientism, Janus faced, essentialist

## Introduction: Taking a Stance on Scientism

How can the doctrine Scientism be understood? As a consequence, how, thereby can the relationship between science and philosophy be cast? Elsewhere, three senses of Scientism—Relativistic, Methodological and Dogmatic Scientism—have been distinguished. The first two can be interpreted as scientific: it is the third Dogmatic sense which can be regarded as Scientism proper but can arise in one of two variants in view of Professor Ladyman's paper "Scientism with a Humane Face" (Ladyman, 2018) and his and Don Ross's text *Every Thing Must Go* (ETMG from now on) (Ladyman & Ross, 2010). In deciding which form of Scientism they take, reference will be made to five central features of that work.

Inquiry can be initiated by considering what Susan Haack considers to be the "six signs of scientism" so that the differences between what I call the scientific and Scientism can be more clearly delineated:

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\* "The more you oppose one another, the more you remain in the same framework of thought" Michael Serres in conversation with Bruno Latour. *Conversations on Science, Culture and Time* 190, R. Lapidus (tr.) Michigan University Press 206, p. 81.

“1. Using the words ‘science’, ‘scientific’, ‘scientifically’, ‘scientist’ etc., honorifically, as generic terms of epistemic praise.

2. Adopting the manners, the trappings, the technical terminology, etc., of the sciences, irrespective of their real usefulness.

3. A preoccupation with demarcation, i.e., with drawing a sharp line between genuine science, the real thing, and ‘pseudo-scientific’ imposters.

4. A corresponding preoccupation with identifying the ‘scientific method’ presumed to explain how the sciences have been so successful.

5. Looking to the sciences for answers to questions beyond their scope.

6. Denying or denigrating the legitimacy or the worth of other kinds of inquiry besides the scientific, or the value of human activities other than inquiry, such as poetry or art” (Haack, 2013, p. 107).

### On Scientific Methodologism and Scientistic Relativism

As we examine these six signs we can see that the force of these claims increases as we pass down the list. And, with Karl Popper’s contribution we can see that his concern was with signs 3 and 4. That is why his contribution was cast as Methodological Scientism, better referred to now as Scientistic Methodologism since it does not regard science as the only valid form of epistemology. Now Ladyman agrees with Popper in arguing that since it is necessary to distinguish between what is scientific and what is pseudo-scientific, we need a means of demarcating the one from the other.

Again, in line with Popper’s stance, Ladyman invokes the demand for a theory of scientific method in order to deal with at least two issues: (a) whether it is possible to justify scientific knowledge; and (b) seeking to satisfy the demarcation condition, thereby ascertaining the limits to what is called scientific. But he rejects the idea of a scientific method deriving from merely empirical considerations such as inductivism, verificationism or falsificationism. His difference from Popper’s stance lies in the fact that for him intersubjective agreement, as Peirce saw, justifies an institutional approach to the methodology question. His dissent from Popper’s position, then, is that he adopts what he regards as Peirce’s stance “a non-positivist version of verificationism—a version that is universally respected by the institutional practice of science” (ETMG, pp. 28 & 29). And within that practice the epistemic legitimation of science is provided by testing empirical claims where, as Peirce and Popper saw, the doctrine of fallibilism provides a key role: “Fallibilism is integral to the scientistic spirit” (Ladyman, 2002, pp. 62 & 80)<sup>1</sup>. With Popper too—even if “intuition cannot be done without” “more often than not it leads us astray” (Popper, 1976, p. 144)—Ladyman regards the idea of intuition as largely suspect. But against Popper, Haack<sup>2</sup>, and Peirce, he rejects any role for common sense (ETMG, pp. 10-11).

Finally, consider three other considerations where Ladyman would not dissent from Popper’s stance. Firstly, despite Popper’s apparent failure to provide a satisfactory definition of *verisimilitude*—approximate truth—Ladyman expresses some sympathy for such a notion (Ladyman, 2002, pp. 232-234). Again, in relation to his institutional account he does not dissent from Popper’s claim that it is by means of “formulated” or

<sup>1</sup> These claims are sustained in his “Scientism with a Humane Face”.

<sup>2</sup> “But common sense, though often right (and especially in its realism), is not always right. And things get really interesting when it is wrong. These are precisely the occasions which show that we are badly in need of enlightenment”. K. Popper. *Unended Quest*, p. 125. “Scientific inquiry is recognizably continuous with more commonplace and less systematic kinds of inquiry—inquiry into the causes of spoiled crops, the design of fishing boats, the medicinal properties of herbs, etc.”. S. Haack *Putting Philosophy to Work*, p. 113.

literary inscriptions comparable to a written text that such legitimation procedures applied to the acceptance of scientific results can be cast as “a branch of literature” (Popper, 1976, pp. 41-44). But one needs to note that the focus in regard to both thinkers lies in relation to the importance that is rendered to the logic of the justification rather than discovery. Thirdly, given that such scientific results and the forms of inquiry that led to them are to be interpreted as human creations, there is no objection by either Ladyman or Popper to “the attempt to extend the use of the methods of natural science to other academic disciplines” (Stenmark, 2001, p. 2).

Sufficient grounds have been given for suggesting that Ladyman’s stance can be characterized as adopting Scientistic Methodologism. Yet there are grounds still to be sceptical about the adequacy of that possibility, but before exploring them we need to refer to a stance that both he and Popper would reject: Feyerabend’s Relativistic Scientism or better Scientistic Relativism<sup>3</sup>. A Scientistic Methodologist need not take his shafts of darkness seriously given the claim that a relativist will “refrain from making assertions about the nature of reality, truth and knowledge and will have to keep to specifics instead”. And when it comes to claims about any kind of principles, Feyerabend claims that he may use the wrong ones; “I may draw the wrong conclusions from them; but I intend to use them as rhetorical devices, not as objective foundations of knowledge and argument” (Feyerabend, 1987, pp. 78 & 79). Thereby discourse becomes sabotaged.

### **Distinguishing Two Forms of Scientism**

An important distinction must be kept in mind: the term “scientific” may be interpreted endogenously, as referring to understanding science from the inside, from within its own practice. The terms Scientistic and Scientism, however, are used exogenously by those, say philosophers of science, whose own discipline is constituted outside science; observers rather than practitioners. Here, the Scientistic Methodologist and Scientistic Relativist have something in common: neither can be seen as dogmatic in their view of the scientific. Both render criticism a central place in their interpretative activity. That is not true for advocates of Scientism. Consider the following characterization by Dr. Leon Kass, former chairman of the President’s Council on Bioethics during the regime of George W. Bush (Kass, 1985; 2002), who in a lecture cast scientism as “our new biology, eliminating all mystery” which “can give a complete account of human life, giving purely scientific explanations of human thought, love, creativity, moral judgement, and even why we believe in God”<sup>4</sup>. Scientism thereby is regarded as equating it wholesale with epistemological inquiry. Nothing can count as knowledge unless it be scientific, namely, explanations based, not on the anecdotal, but on empirical evidence, invoking measurement, leading to information acquisition. Accordingly, not only biology and physics are honoured scientifically but consider acoustics which may not be regarded as fundamental as physics is. Then there are other disciplines—chemistry, economics, psychology and cognitive science understood as behavioural forms of inquiry, allowing too aspects of anthropology and ethology that satisfy the behavioural requirement—all these can be included within such an epistemic paradigm. Thereby, what can be called a “transcendental framework of processes of inquiry”, determined by a knowledge constituting interest, can

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<sup>3</sup> For Feyerabend there is “no one scientific method, but there is a great deal of opportunism: anything goes—anything, that is, that is liable to advance knowledge as understood by a particular researcher or research tradition”. *Farewell to Reason*. (1987). London: Verso 1990 p. 36; scientific method can be regarded as but “an ornament” “Consolation for the Specialist” *Criticism and the Growth of Knowledge*. I. Lakatos & A. Musgrave (eds.) Cambridge University Press, 1970, p. 229. Whilst science itself “is not one tradition, but it is many, so it gives rise to many and poorly incompatible standards”. *Against Method* (3rd. ed.). London: Verso 1993, p. 231.

<sup>4</sup> Quoted by John Tierney “Who’s Afraid of Soulless Scientism?” *New York Times*, November 26, 2007.

render a technical control of nature and the natural, secured and expanded through information and feed-back monitored action (Habermas, 1972, p. 135).

Now two possibilities open before us. To clarify them let us examine Karl-Otto Apel's recognition of what he calls the "Scientistic Fallacy". Consider the following three questions: (A) "Why did *I* do x?"; (B) "Why did *you* do that?"; and (C) "Why did *event E* occur?". Question (A) is a first person, (B) a second person, and (C) a third person question. The fallacy lies in regarding (A) and (B) questions as being reducible to question (C): "the why-question demanding justification must turn into a question demanding explanation for the existence or occurrence of the action as a spatio-temporal event". Such a translation of the first and second speech dimensions into the third implies priority given to the standards of observation and to the theoretical distancing of another person along with his or her actions. The other human being no longer acts but rather performs or responds in behavioural terms (Apel, 1984, pp. 150 & 200).

### Janus-Faced Scientism

The first possibility represents a Janus-Faced Scientism. (A) type questions would be allowed whereas (B) type second person questions would dissolve into third person questions of (C) type. A person thereby could adopt a private world orientation so as to be able to employ say "the experiential potential gathered in non-objectivating dealings with nature" (Habermas, 1982, pp. 224-225) within an existential decisionism to sustain that world orientation whilst adopting a behavioural stance towards the responses of other people regarded simply as spatio-temporal events. Hence we have an existential behaviourism combining the possibility of (A) type questions in the private realm and (C) type questions in the public<sup>5</sup>. Such "schizophrenia" (Santmire, 1973, p. 83) might make possible an endorsement of say an aesthetic perspective for a person's private life, whilst in the public realm s/he strives to have his or her behaviour explained through the attainment of achievement targets presupposed by the "mission" statements inspired by a vision constituting business performances.

### Essentialistic Scientism

This "schizophrenia" can be dismissed by seeking refuge in "the fundamentalist belief that science can do no wrong and will ultimately answer any question worth answering while in the process saving humankind as a bonus"<sup>6</sup>. What is not science can be easily dismissed! So the meaning of science and scientific objectivity is to be understood through a monopolistic vision sustained by the natural sciences, the language of which becalms intelligence. So Ladyman and Ross quote Skinner with apparent approval<sup>7</sup>. Do we have, then, a warrant for a purveyor of an Essentialist Scientism implying "that the social progress of science will bring about simultaneously a rationalization of human conduct, whose 'habits' may be conceived as being analogous to natural laws" (Apel, 1980, p. 90).

Elsewhere this Essentialist claim has been challenged, given the emphasis that Peirce, for example, places on instinct in scientific discovery and common-sense in everyday life. Yet there remains the problem of trying

<sup>5</sup> Karl-Otto Apel (1922-May 15, 2017) ascribes the origins of this possibility to the writings of Max Weber. *Understanding and Explanation*, p. 15.

<sup>6</sup> M. Pigliucci. *Denying Evolution: Creationism, Scientism & the Nature of Science*. Sunderland, Mass.: Sinauer Assoc. Pub., 2002, p. 114: Cf. "the thought that the scientific is much more valuable than the non-scientific, or the thought that the non-scientific is of negligible value". T. Sorrell. *Scientism*. London: Routledge 1994, p. 9; Cf. "the ideology of science" F. A. Olafson. *Naturalism and the Human Condition*. London: Routledge 2001, p. x.

<sup>7</sup> "What, after all, have we to show for non-scientific or pre-scientific good judgement, or common sense, or the insights gained through person experience? It is science or nothing" (ETMG, p. 12). B. F. Skinner. *Beyond Freedom and Dignity*. 1971, New York: Knopf, pp. 152-153.

to distinguish science cast endogenously and that of a philosopher examining scientific activity exogenously! What an advocate of the latter may regard as important and pertinent for understanding, the former must recognize and attempt to account for the way in which the results of scientific activity, even if interpreted endogenously, actually become embodied (Ihde, 1991, pp. 30-31) in techno-science (Latour, 1987, pp. 174-175), its aim understood through the spectacles of its application imposed “upon the researcher”. Within this “technical process” (Gehlen, 1980, p. 70) the speculative results of inquiry can be transformed into ontological claims by means of epistemology’s railroad industry, legitimated through the laboratory in its setting down of tracks into a created world upon which scientific facts are made to run<sup>8</sup>.

Apel’s stance may indicate at least the way an Essentialistic Scientism differs from its Janus-faced version, namely in terms of a normative claim and a predictive one. With advances in social technology—mobile phones, Ipads, virtual reality phenomena—and social engineering—consider the influence of media, false news, advertising etc.—Skinner’s stance would cast the relationship between the sciences and practice as legitimizing interpreting human practices as behavioural responses to be conditioned by such contemporary developments. After all, even as Peirce put it:

Modern science, with its microscopes and telescopes, with its chemistry and electricity, and with its entirely new appliances of life, has put us into quite another world; almost as much so as if it had transported our race to another planet. (CP 5.513)<sup>9</sup>

And rather than regard this technized standpoint as already with us, Skinner’s stance might well serve as a way of understanding how cultural developments will unfold for all our futures. Thereby the idea of an Essentialistic Scientism would be achieved: universal contingent laws offering plausible causal explanations for the actions of human beings.

Such a stance would regard any communication or human action as “a natural object of investigation of the empirical sciences” (Apel, 1980, p. 97). Persons then become Hobbesian creatures whose speech is to be characterized as utterances “produced in appropriate inter-relation, the utterer thereby intending to communicate to an audience his thoughts, desires and so on” (Hungerland & Vick, 1973) but from a stance outside it, separated from the thoughts and desires of the communicator him/herself in originating that communication. Thereby s/he as communicator and members of that audience can regard a speech-act as an event to which they may or may not respond behaviourally. As the communicator frees him/herself from the feelings of obligation towards another, s/he thereby can freeze awareness of others in his/her relation to them. Such calculated manipulation of discourse and human activities reduces the other person merely to an object or competing adversary, sustained by a captivating picture which such discourse reinforces inevitably.

### **To Be a Scientific Methodologist or an Advocate of Scientism**

Whether in the Janus-faced or Essentialistic sense we are now in a position to decide whether Ladyman and Ross are really committed to Scientism’s defence (EMG, pp. 1-65). Clearly they would not sustain a Scientistic Relativism captured by Feyerabend’s slogan “neither ‘facts’ nor abstract ideas can ever be used for

<sup>8</sup> “The itinerary of facts becomes as easy to follow as that of railways or telephones”. B. Latour. *We Have Never Been Modern*. C. Porter (tr.). New York: Harvester Wheatsheaf 1993, p. 119.

<sup>9</sup> Or later, consider the way Adorno expressed the matter: “The human subjects, whom psychology pledges itself to examine, are not merely, as it were, influenced by society but are in their inner core formed by it”. T. W. Adorno. “On the Logic of the Social Sciences” (1961). *The Positivist Dispute in German Sociology*. T. W. Adorno (et al.) (eds.) London: Heinemann 1976, pp. 105-122, p. 119.

defending certain principles come what may”<sup>10</sup>. Rather, their stance seems to embrace much of what has been called Scientific Methodologism, as advocated by those supposed to belong to what Feyerabend calls “the Popper Circle” (Feyerabend, 1987, pp. 185 & 289). Obviously there will be differences between the latter and Ladyman and Ross just as there are differences between that circle of inquirers. But consider their endorsement of the importance of demarcating science from non-science; that an account of scientific method is necessary, even if it is an institutional account rather than one of falsificationism; the adoption of fallibilism as the scientist’s creed; a sympathy for the idea of verisimilitude; that the written word is necessary to provide a rationale for accepting a scientific theory, even if the latter has to employ a mathematical form of language; that the logic of justification takes precedence over discovery; that the methods of natural science can be applied to other academic disciplines. Surely they must be regarded simply as Scientistic Methodologists, a claim that can be buttressed by referring to five of their central concerns.

### The Attack Upon Mere Language Analysis

Since Socrates philosophers have been concerned with analysis but some questions—thought to be of a philosophical nature—are now regarded differently with respect to scientific enlightenment. Avil Seth, professor of cognition and computational neuroscience at Sussex University, for example in speaking about consciousness, appealed to language use in distinguishing between the *simulation* of something—say bird flight in terms of acknowledging flapping wings and feathers—and its *instantiation* through an appropriate theory of aerodynamics. Thereby in his work, scientific inquiry and philosophical speculation cannot be separated since we lack a theory of consciousness: “study of the brain goes beyond physics”<sup>11</sup>. But the recognition of the significance of science for philosophy was, of course, recognized by Peirce and closer to our own time by Alfred North Whitehead and Charles Hartshorne.

Secondly, in an informative discussion with Massimo Pigliucci and Julia Galef in *Rationally Speaking*<sup>12</sup>, Ladyman referred to physical explanations being inexpressible in ordinary discourse, since what we require from it slips from our examination of that discourse. But it needs to be shown that the former are or are not supervenient upon ordinary discourse and how. Secondly, can such explanations be legitimated without employing ordinary discourse?

Thirdly, it is important to pay attention to language use. Philosophers are aware of the dangers of Naturalistic Fallacy, seeking to establish value claims from facts. Normative Fallacy is much less recognized. It reverses Naturalistic Fallacy<sup>13</sup>: assertions about what is the case are thought to follow from beliefs about what ought to be so. A story about the importance of institutional procedures (ETMG, p. 28) maybe true as a narrative about how science *ought* to proceed, but it is a *factual* matter as to whether it accounts for what

<sup>10</sup> P. Feyerabend. “How to Be a Good Empiricist”. *The Philosophy of Science*. P. H. Nidditch, Oxford University Press 1968, pp. 12-39, p. 39 or that the “whole history of thought is absorbed into science and is used for improving every single theory”. *Against Method*, p. 33.

<sup>11</sup> A. Seth. “On Consciousness”. The Life Scientific Tues. 16/05/2015 BBC Radio 4 9.00/21.30; *30-Second Brain*. London: Icon Bks. 2015.

<sup>12</sup> <http://rationallyspeakingpodcast.org/show/rs69-james-ladyman-on-metaphysics.html>.

<sup>13</sup> T. D. Campbell. “The Normative Fallacy”. *Philos. Quart.* 20(81) (1970) pp. 368-377. With respect to a furore regarding British spies, foreign minister William Hague in 2014 reiterated his claim that the UK has the world’s strongest system of regulation and that agencies do not breach it because we live in the UK not the USA. The Guardian’s editor in chief along with Tory MP David Davis claimed that this claim was “laughable”. (cf/ The Guardian Sat. 18th. Jan. 2014, p. 4) What Hague could only mean was that the state of affairs he described ought to be so!

actually happens within scientific activity, as expressed in the work of such thinkers as Bruno Latour<sup>14</sup>. Of course this raises the issue of the significance of endogenous concepts in understanding scientific activity as opposed to an exploration of the philosopher of science's use of exogenous concepts.

### The Defence of Metaphysics

For Ross and Ladyman, any metaphysical concerns have to refer to what they call *the principle of naturalistic closure (PNC)*<sup>15</sup>. But that claim—the unifying of fundamental physics with the special sciences—may be necessary in defining the role of metaphysics, but sufficient? Moreover, the PNC is supposed to act as a “constraint on metaphysical hypotheses” (ETMG, p. 37). But the idea of what science itself is and empirical evidence are distinguishable, the former of interest more to the philosopher, the latter to the scientist. Advocating the PNC appears to run these two together (Chakravartty, 2013, p. 33).

Elsewhere it has been argued that Ladyman and Ross fail to give an account of what is meant by that term metaphysics and how different kinds of metaphysical claims require clarification. Anjan Chakravartty remarks: “the very idea of naturalized metaphysics is subject to a debilitating vagueness which renders its advocates unable to articulate convincingly what it is that makes metaphysical theorizing acceptable in some domains and problematic in others” (Chakravartty, 2013, p. 30). Ladyman clarifies those legitimate parts of science that are unfalsifiable, existential statements and unfalsifiable scientific principles (Ladyman, 2002, pp. 82-84). But what is the status of these claims? Consider the assertion “the only source of knowledge is the world of experience” (Chakravartty, 2007, p. 190). Surely it is the case that speculation extended beyond direct observation or “observation” (observation mediated by instruments) must spell “some trust in metaphysics, however vaguely these metaphysical notions may be entertained in explicit thought” (Whitehead, 1933, pp. 163-164). Speculating about the world in a manner stretching beyond observation is “to engage in metaphysics” (Chakravartty, 2007, p. 190). As Kuhn demonstrated, these unfalsifiable notions are carried in the consciousness of the scientist even if unexplored (Chakravartty, 2013, p. 35).

### The Advocacy of Scale Relative Ontology (SRO)

Ladyman and Ross's advocacy of SRO contributes to ways of considering “what there is”. They point out that the idea of particles as basic to what exists is a hang-over from the seventeenth- and eighteenth-century “mechanistic and materialist metaphysics” (ETMG, p. 4)<sup>16</sup>. Whitehead indicated the real danger here: “One of the dangerous fallacies in the construction of scientific theory is to make observations upon one scale of magnitude and to translate their results into laws valid for another scale” (Whitehead, 1964, p. 165). Elsewhere it is argued that the dispute between Schelling and Hegel, for example, arises as a result of each speaking past the other. Whereas Schelling is speculating at the cosmological scale where mountains, cats, and human beings simply do not exist, Hegel is pitching his case where such entities clearly do so at the everyday scale (Ladyman

<sup>14</sup> Cf. B. Latour (et al.). *Laboratory Life: The Construction of Scientific Facts* (1979) Princeton University Press 2nd ed. 1986; “Give Me A Laboratory & I Will Raise the World” Science Observed K. D. Knorr-Cetina (et al.) (eds.) London: Sage 1983, pp. 141-170.

<sup>15</sup> “Any new metaphysical claim that is to be taken seriously at time should be motivated by, and only by, the service it would perform, if true, in showing how two or more specific scientific hypotheses, at least one of which is drawn from fundamental physics, jointly explain more than the sum of what is explained by the two hypotheses taken separately, where this is interpreted” (ETMG, p. 37) subject to certain terminological stipulations.

<sup>16</sup> “The single most important idea we are promoting in this book is that to take the conventional philosophical model of an individual as being equivalent to the model of an existent mistakes practical convenience for metaphysical generalization” (ETMG, p. 229). The *italics* are those of Ladyman and Ross.

& Ross, 2013, p. 108)<sup>17</sup>. Ladyman and Ross, of course, are interested in the scale of magnitude at the micro-level.

Yet, “like Columbus who never visited America” Ladyman and Ross may have “missed the full sweep” of their “own discovery”<sup>18</sup>. It is one thing to consider these three scales as each valid for their own limited purposes, especially in the case of measurements, another to claim, that the micro-level must rule supreme over the other two. Whereas the cosmological, with talk about *Being*—alla Heidegger following in the footsteps of Schelling—is pitched at a cosmological level, *reality* pertains to what human beings have constructed—human institutions such as marriage, schools, houses of parliament, promise-keeping, what Hegel referred to as “second nature”—as well as making nature subject to the social whilst the question with respect to what *exists* is cast at the micro-level. Thereby it becomes possible to distinguish Being from reality, and both from existence. Nothing claimed here contradicts what Ladyman and Ross say about scale relativity whether applied ontologically, as suggested, or epistemologically: “it is the idea that which terms of description and principles of individuation we use to track the world vary with the scale at which the world is measured”. On the one hand, they desire not to reduce explanations at the level of one scale of observation to any other nor to claim that what is actual at some scale can be regarded as not valid at all (ETMG, pp. 199-200). But an obsession with the micro-level may obfuscate the real value of Don Ross’s discovery!

So what are we to make of any defensive remarks made about forms of inquiry which deserve respect epistemologically? Inquiries can be cited more interpretative rather than explanatory in character, where humanity and culture are studied such as history—natural, local or academic—legal inquiry, political science or non-behavioural psychology or sociology. To say such subject matters are deserving of epistemic respect is not enough. Why, given such flag waving for the natural sciences? And Habermas offers a rationale in terms of a political—understood in Aristotle’s sense—cognitive interest where the focus is primarily upon interpretation, concerned with the meanings of what people do as opposed to the observation of events, the latter forwarding a technical cognitive interest (Habermas, 1972, p. 410). The value of the arts and philosophy can serve to release self-reflection determined by what Habermas calls an emancipatory cognitive interest (Habermas, 1972, p. 310) cast as a play or dialectic between the two previous cognitive interests, the technical and the interpretative.

Clearly Ladyman and Ross can respond by claiming that the forwarding of the empirical sciences<sup>19</sup>, cannot be separated from interpretative activity; interpretative issues, presupposed, by scientists themselves, are employed within the application of their own tacit knowledge, as Polanyi and Kuhn emphasized. Meanwhile, the issue which interests Ladyman more is the extent to which scientific activity can throw light on the pursuit of the social modes of inquiry and wider cognitive issues associated with the arts and philosophy. But whereas the latter have traditionally dealt with questions concerning Being at, as it were, the cosmological scale—note how thinkers such as Schelling, Heidegger and Benjamin cap-doff to poetry and literature—interpretative questions concerned with human action seem to pertain to the everyday world created socially. Finally we have

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<sup>17</sup> “Mere patterns—stable but nonredundant relationships in date—are distinguished from ‘real’ patterns by appeal to mathematical information theory”.

<sup>18</sup> Whitehead’s remark in 1929 refers to Descartes: A. N. Whitehead. *Process and Reality* (Corrected ed.). D. R. Griffin & D. W. Sherburne (eds.). New York: The Free Press (Macmillan) 1979, p. 159.

<sup>19</sup> Disclosing what exists “subject to the constitutive interest in the possible securing and expansion, through information, of feed-back-monitored action”. J. Habermas. *Knowledge and Human Interests*, p. 309.



the scale that interests Ladyman and Ross, “fundamental physics”<sup>20</sup>. But does that keen interest with that technical cognitive interest thereby mean that the other two scales of awareness are to play second fiddle, even if forms of inquiry concerning them are not to be reduced or replaced by empirical-analytic knowledge? So let us turn to a philosopher’s writings beset with these issues in a previous century.

### The Rehabilitation of Charles Peirce’s Philosophy

The real significance of Peirce’s philosophy does not lie in a mere scholasticism that dominates most of the scholarship, but rather how his thought relates to that of others (Apel, 1995) and how it can illuminate discussions regarding important philosophical questions. The text ETMG supports the latter stance to show how Peirce’s scientific position implies the idea of science cast as “a community enterprise” (ETMG, p. 28) thereby sustaining an institutional conception of scientific method to settle the argument between verificationism and falsificationism:

A hypothesis is something which looks as if it might be true and were true, and which is capable of verification or refutation by comparison with facts. The best hypothesis, in the sense of the one most recommending itself to the inquirer, is the one which can be the most readily refuted if it is false. (CP 1.120)<sup>21</sup>

What ETMG fails to do is to articulate clearly the root of Peirce’s “Verificational Realism” (Thompson, 1978) namely his “Indagation” (CP 6.568), his logic of Abduction even though that text credits the “importance of modality” in interpreting nomological knowledge (ETMG, p. 129) arising from it, separating pragmatism from his pragmatism<sup>22</sup>. The first step in Abduction focuses on the “first starting of a hypothesis and the entertaining of it, whether as a simple interrogation or with any degree of confidence, is an inferential step” (CP 2.525) which Peirce came to call *Retroduction* (CP 1.68); leading from consequent to antecedent (CP 6.469). It explains the possibility of an hypothesis inspiring *Deduction*, the drawing out of consequences and then *Induction* expressed through testing. But how does that initial generation of a hypothesis arise?

Intuition is rejected<sup>23</sup>. But Peirce defines *Retroduction* as “the spontaneous conjecture of instinctive reason” (CP 6.475) even though it “does not afford security” (CP 6.470) before being tested via *Deduction* and *Induction*. To imply that *Retroduction* has no part to play in scientific inquiry because “individual human beings are poorly prepared by evolution to control complex inductive reasoning across domains that did not pose survival problems for our ancestors” (ETMG, p. 28) may well not apply to scientists engaged in discovering new hypotheses because their consciousnesses are embedded in a whole host of cognitive presuppositions governing their activity. But to assert this claim would be to give more weight to the logic of discovery rather than to that of justification.

The other aspect of Peirce’s philosophic approach that is important appears in his *Doctrine of Chances* of 1878: science can inform the value question. Peirce refers to his three logical sentiments that must underpin scientific inquiry or indeed any kind of inquiry if truth is to be achieved or indeed for inquiry to be possible at

<sup>20</sup> Especially “that part of physics about which measurement taken anywhere in the universe carry information” proves relevant (ETMG, p. 55).

<sup>21</sup> “We usually investigate scientific questions, by trying successive hypotheses until I found one that experiment would not refute” (CP 7.197).

<sup>22</sup> “If a substance of a certain kind should be exposed to an agency of a certain kind, a certain kind of result *would* issue, according to our experiences hitherto. As for the pragmatist it is precisely his position that nothing else than this can be so much as *meant* by saying that an object possesses a character” (CP 5.457).

<sup>23</sup> Even if “we seem to *feel* that we have it” (CP 5.214). “We have no power of Intuition, but every cognition is determined logically by previous cognitions” (CP 5.265).

all. These are “interest in an indefinite community, recognition of the possibility of this interest being made supreme and hope in the unlimited continuance of intellectual activity, as indispensable requirements of logic” interpreted as “that famous trio of Charity, Faith and Hope” (CP. 2.655). The significance of this trio and the way it developed into Habermas’s advocacy of four validity claims: intelligibility, truthfulness, sincerity in truth pursuance, and rightness (Habermas, 1979) would be the subject of another paper.

### **The Rejection of a Traditional Conception of Materialism**

Ladyman and Ross would reject Materialism (Feyerabend, 1981, p. 161)<sup>24</sup>. For them “to be is to be a real pattern” so that to understand materialism must mean—against Hegel—rejecting anything supernatural, meaning what might be taken “to exist extramaterially” (ETMG, pp. 62-63). How, more generally speaking, a materialistic stance can be made appropriate within a wider context has been explored elsewhere. Sufficient to say herein is that it remains controversial how such patterns are constituted; whether they are to be interpreted as physical, mathematical or are merely theoretical in character.

### **Conclusions**

Ladyman and Ross’s stance “In Defence of Scientism”. (ETMG, ch. 1) has been addressed. But Scientism is defined as the identification of knowledge with science. After distinguishing the Scientistic from the Scientific, the former focusing on regarding science exogenously—on its results—rather than casting it endogenously in terms of its practice, two forms of the scientistic were delineated: Scientistic Methodologism and Scientistic Relativism. It was then argued that Scientism too has two forms: Janus-Faced Scientism and Essentialistic Scientism. The latter is more predictive in character in rejecting the possibility of sustaining a subjective existentialism maintained in a person’s privacy, whilst regarding public performances of human beings as spatio-temporal events. By considering five crucial achievements of ETMG, it was shown that despite approval being sustained for Skinner’s stance, difficulties in sustaining institutionalism in demarcating science from non-science, a minimalist characterization of metaphysics, a weakened account of Scale Relative Ontology, gaps in the treatment of Peirce’s scientized philosophy and obscurity in regard to the status of other disciplines and patterns at the micro-level, Ladyman and Ross do not endorse Scientism. All the sound and fury associated with that doctrine merely signifies an ambiguous Scientistic Methodologism.

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<sup>24</sup> In assuming “that the only entities existing in the world are atoms, aggregates of atoms and that the only properties and relations are the properties of, and the relations between such aggregates”.

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