

In Defense of Scientism *

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Scientism is the thesis that all cognitive problems concerning the world are best tackled adopting the scientific approach, also called ‘the spirit of science’ and ‘the scientific attitude’. While most contemporary philosophers reject scientism, arguably scientists practice it even if they have never encountered the word. However, the correct meaning of ‘scientism’ has proved to be even more elusive than that of ‘science’, which in ordinary language encompasses everything that is neither ordinary nor confused.

Scientism started out in the middle of the French Enlightenment, that is, about 1750. More precisely, scientism is the cultural and political formula: “Science has replaced religion because it is inherently progressive, whereas religion is conservative.”

The reason science is progressive, it was argued, is that its practitioners engage in rigorous research and rational debate, whereas religious believers do not search for new truths, are gullible, repeat moth-eaten dogmas, comment only on outdated books, and do not participate regularly in open meetings to share and discuss new findings.

Furthermore, religious dispute involved endless debates that can only be terminated by authority, whereas among scientists differences of opinion are publicly discussed, and are resolved, finally, by rational argument jointly with hardly-won evidence rather than by recourse to either authority or faith.

The neologism ‘scientism’ was coined more than a century after the corresponding concept. It was popularized by the embryologist Félix le Dantec (1912: 68), and it was clearly defined by Lalande’s (1939: p.740) classical *Vocabulaire*. However, the concept had been hatched much earlier in the radical wing of the French Enlightenment. And both word and concept occurred in other contexts, particularly in religious publications, where it was always used in its pejorative sense.

Peter Schöttler (2013: p.98) found that, around 1900, the words ‘science’ and ‘scientism’ were usually accompanied by the following epithets in the relevant French literature: abstract, anti-religious, bankrupt, cold, dogmatic, durkheimian, exaggerate, false, German, gross, heavy, laic, lame, materialist, narrow, pedantic, positivist, pretentious, rationalist, socialist, stupid, and vulgar. A contemporary study might yield a similar result: after one century, science and scientism continue to be two of the *bêtes noires* of the obscurantist party.

Scientism has often been equated with positivism, in particular Comte’s. While it is true that Comte stated that sociology (a word he coined) ought to be rendered scientific, he made no contributions to it, and did not appreciate Condorcet’s essays in mathematical social science. Moreover, he believed that sociology and biology should test their hypotheses by comparison rather than experiment. Worse, in line with the phenomenalism of Hume and Kant, Comte condemned all talk of atoms, the innards of stars, and other unobservables.

Consequently, for all his praise of science, Comte’s positivism can hardly be regarded as scientific. This is why Emile Meyerson (1931) – one of the two philosophers who corresponded with Einstein – missed no occasion to criticize Comte’s ban on all the research projects that attempted to catch realities underneath phenomena.

Friedrich Hayek (1952) – who, in line with the Austrian tradition, disliked the French Enlightenment – ignored the classical definition recalled above, and offered his own idiosyncratic one: scientism would be “the attempt to ape the natural sciences” in social matters. This slanted concept of scientism is the one that has prevailed in the humanities, particularly since the post-modernist counter-revolution that started about 1950, and recruited those left behind as well as those who blamed science for the sins of ‘the establishment’. To understand this change in the evaluation of scientism, we must take a closer look at its historical background, as well as at the reaction it elicited.

1 Enlightenment Scientism

Along with secularism, egalitarianism, humanism, and materialism, scientism was a component of the radical wing of the French Enlightenment, from Diderot, Helvétius, d’Holbach and La Mettrie to Cloots, Condorcet, Mirabeau, and Maréchal. This strand was at odds with both the moderate wing of the same vast movement (d’Alembert, Montesquieu, Rousseau, Turgot, and Voltaire) and the far smaller and paler Scottish Enlightenment – Hume, Smith, and Hutcheson. (See Israel 2010 for the great differences between the two wings.)

Whereas the above-mentioned French were revolutionaries both philosophically and politically – albeit of the armchair kind - the Scots were reformists. In particular, the moderates did not share the atheism and republicanism of the French radicals. Nor did they adopt the scientific manifesto contained in Condorcet’s reception speech at the French Academy in 1782. There he declared his trust that the ‘moral [social] sciences’ would eventually ‘follow the same methods, acquire an equally exact and precise language, attain the same degree of certainty’ as the physical [natural] sciences (Condorcet 1976).

Condorcet’s scientism did not involve the ontological reductionism exemplified in recent years by sociobiology, pop evolutionary psychology, neuroeconomics, and the rest of the purely programmatic neuro hype. Indeed, in the same lecture, Condorcet noted that in the moral sciences ‘the observer himself forms part of the society that he observes’. Therefore, presumably, he would have welcomed the so-called Thomas theorem, according to which in social matters appearance is reality, in that people react not to external stimuli but to the way they ‘perceive’ them. So, Condorcet’s scientism was not naturalistic: he knew that machines and social systems, though material rather than spiritual, were artificial or man-made, hence just as unnatural as science, ethics, and the law. (For the differences between naturalism and materialism see Bunge 2009a.)

Much the same applies to Condorcet’s philosophical comrades in arms, in particular Thiry d’Holbach, who treated the two branches of factual science in two different volumes: *Système de la nature* (1770) and *Système social* (1773). Their scientism was methodological, not ontological, which is why it is wrong to call it ‘methodological naturalism’, the way Popper (1960) did. Incidentally, the French Enlightenment was a blind spot of his, as of the entire Austrian cultural tradition: Austria had missed the Renaissance, the Reformation, the Scientific Revolution, and the Enlightenment, and only in mid-nineteenth century leaped from the Middle Ages to its own Industrial Revolution and ‘Late Enlightenment’ marked by Bolzano, Mendel, Mach, and Boltzmann.

Besides, Popper – never eager to define his key words, in particular ‘historicism’, ‘collectivism’ and ‘scientism’ – had left social philosophy to Hayek, on whom he depended to be hired by the London School of Economics, and who ‘managed to corrupt his socialism’, as Hacoen (2000: 486) has documented. For all of these reasons, Popper should not be taken as an authority on either scientism or social science.

The Vienna Circle adopted all of the principles of the radical wing of the French Enlightenment except for materialism: it remained shackled to the phenomenalism essential to Hume, Kant, Comte, and Mach, according to which all there is (or at least all that can be known) is appearance (to someone). With the exception of Otto Neurath, the Circle was indifferent to social science, which on the whole paid at least lip service to the Enlightenment’s scientistic tradition; this is what their unified science program meant (Neurath 1955).

The standard economic theorists, in particular Menger, Jevons, Walras and Marshall, had practiced scientism in the pejorative sense of the word: theirs is best called mock science. Indeed, they produced a voluminous body of work, namely neoclassical microeconomics, bristling with symbols that intimidated the non-mathematicians but were neither mathematically well-defined nor enjoyed any empirical support (Bunge 1996, 1998). In particular, they did not subject their hypotheses to empirical tests, the way Daniel Kahneman and the Zürich group of experimental economics have been doing in recent years – alas, with bad results for economic orthodoxy (see, e.g., Gintis et al. 2005).

2 Counter-Enlightenment Anti-scientism

The German philosopher Wilhelm Dilthey (1883), who was heavily indebted to both Kant and Hegel, wrote the anti-scientism manifesto. The latter had both an ontological and a methodological component. The former consisted in the thesis that everything social is *geistig*, (spiritual, moral) rather than material. Its methodological partner is obvious: the social studies are *Geisteswissenschaften* (spiritual sciences), hence deserving a method of their own. This was *Verstehen*, or comprehension, or interpretation, rather than explanation in terms of mechanisms and laws.

According to Dilthey, *Verstehen* consists in the intuitive or empathic ‘understanding’ of an actor’s intentions. The tacit reasoning underlying Dilthey’s view is this. According to vulgar opinion, history is the doing of Great Men – mostly strongmen and geniuses. Hence one must empathize with them, or put oneself in their shoes, if one hopes to understand what has been going on. *Verstehen*, consists in empathy or fellow-feeling (*mit-gefühl*) according to Dilthey, and in guessing intentions or goals in the case of Weber.

Hence the need to do *verstehende* (interpretive) or ‘humanistic’ rather than scientistic studies. Of course, neither Dilthey nor his followers suspected that the problem of ‘inferring’ (guessing) mental states from behavior is an inverse problem, and as such one for which no algorithms are available, so that any proposed solution to it is speculative and dubious (see Bunge 2006).

It is usually assumed that Max Weber has been the most famous of the practitioners of ‘interpretive sociology’, the subtitle of his magnum opus (Weber 1976). Besides, he regarded himself as a follower of Dilthey’s (Weber 1988). But, at least since his admirable defense of objectivism or realism (Weber 1904), Weber tried to practice the scientific method, and

occasionally even adopted historical materialism – for instance, when he explained the decline of Rome as a result of the shrinking of the slave market, which in turn resulted from the cessation of the expansionary wars, the main source of slaves (Weber 1924). In short, Weber started out his sociological career as an opponent of scientism, only to become an occasional if inconsistent practitioner of it. By contrast, his rival, Emile Durkheim (1888), was all his life a vocal defender and consistent practitioner of scientism – and as such the butt of much of the anti-scientistic rhetoric of his time.

Hermeneutics, or textualism, is an offshoot of Dilthey's thesis that communication is the hub of social life. His followers, such as Claude Lévi-Strauss, Paul Ricoeur and Charles Taylor, held that societies are 'languages or like languages'. Hence the study of society should concentrate on the symbolic, and aim at catching 'meanings', whatever these may be. (In colloquial German, *Deutung* may denote either sense or intention – an equivocation that facilitates the jump from the goal of an agent to the meaning of his utterances.)

But of course, if one focuses on words, rather than basic needs, one cannot understand why people work, cooperate, or fight. No wonder hermeneutics had nothing to say about the main social issues of our time, from oil wars to technological unemployment to the rise of China to the decline of empires. On the contrary, a scientistic social science, one focusing on groups rather than individuals, and armed with statistics instead of literary metaphors, should have much to say about those huge social events.

3 Testing anti-scientism

How has the interpretive or humanist approach fared? Let us evaluate the pivotal theses of the anti-scientism movement, from Dilthey's *Verstehen* to mid-twentieth century hermeneutics (or text interpretation).

1/The natural/cultural dichotomy was stillborn.

Indeed, by the time Dilthey proclaimed it, a number of hybrid sciences had been in existence, notably human geography, psychophysics, epidemiology, and demography. And shortly thereafter further biosocial sciences emerged, among them medical sociology, physiological psychology, developmental cognitive neuroscience, social cognitive neuroscience, and socioeconomics.

For example, explaining such bottom-up processes as Puberty → Altered feelings → Changed social behaviour; and top-down ones like Subordination → Higher corticoid level → Lower immunity, call for the merger of neuroscience, cognitive neuroscience, and sociology.

The preceding examples should refute the charge that scientism involves micro-reduction or levelling down. When accompanied by a science-oriented ontology, scientism favors the merger or convergence of different disciplines rather than simplistic micro-reduction (Bunge 2003). All such disciplinary mergers show is that the nature/culture wall erected by the interpretive or humanistic school obstructs the advancement of science.

2/The Verstehen method has been fruitless.

Indeed, no interpretive (or humanistic) student of society has ever come up with true conjectures about any important economic, political or cultural processes, such as the rise and corruption of democracy. The writings of members of this school are published only in marginal journals.

However, a few students of society in the humanist camp have produced some insightful work. Suffice it to recall the brilliant essays of Norberto Bobbio, Albert O. Hirschman, and Thorstein Veblen. Also Bronislaw Malinowsky, Margaret Mead, Clifford Geertz and Napoléon Chagnon have written highly readable, if disputed, descriptions of certain exotic practices. However, none of these anthropologists was particularly interested in ordinary life except for sex: their subjects seemed to subsist on thin air. (See Trigger 2003 for an explicitly realist and materialist counterbalance.)

To see social studies at their best one must look at the work of anthropologists, archaeologists, sociologists, and historians of the scientific persuasion, such as the *Annales* school, Gunnar Myrdal's monumental and influential *American Dilemma*, the inventory of archaeological pieces before being drowned by the Aswan dam, and the massive study *The American Soldier*. The publication of the latter work in 1949 elicited the anger of the humanistic school, but it also marked the coming of age of the scientific strand of American sociology, with Robert Merton at its head and the *American Sociological Review* as its flagship.

Why has anti-scientism failed? Arguably, it failed because it condemned and spurned the scientific method, which has characterized all of the scientific achievements since the Scientific Revolution. Moreover, when tackling new cognitive problems, every contemporary investigator takes scientism for granted, as will be argued below.

4 The philosophical matrix of scientific research

Most philosophers take it for granted that science and philosophy do not intersect: that scientists start from data, or from hypotheses, and handle them without any philosophical preconceptions. A glance at the history of science should suffice to indict this thesis as a myth.

A quick examination of a few open problems will corroborate this harsh verdict.

Let us imagine how a scientist would tackle an open problem, such as (a) whether 'dark matter' and 'dark energy' defy all known physical laws, (b) which if any acquired characters are inheritable, (c) whether some animals can be in conscious states, (d) how to manage social systems, such as business firms and armies, in a rational fashion, and (e) whether the law and the courts can and should use scientific evidence in addition to the traditional methods.

Would our scientist refuse to investigate these problems, joining Noam Chomsky and his fellow 'mysterians' (radical skeptics), in holding that matter and mind are and will forever remain mysterious? Would he jump into *medias res*, instead of starting by reviewing the relevant background knowledge? Would he fantasize about anomalous events and abnormal or even supernatural powers, or would he filter out the spiritualist fantasies? Would he remain satisfied with listing appearances or symptoms, or would he conjecture possible patterns and their underlying mechanisms? Would he remain satisfied with his hunches, or

would he seek empirical corroboration? Would he confine his attention to the object of his research, or would he place it into its context or wider system? And would he dismiss out of hand all concerns about the possible harmful effect of his findings?

Admittedly, all of the previous questions are loaded. But this is the point of our exercise: to suggest that genuine scientists do not investigate the first guess that comes to mind, just as they do not question all of the antecedent knowledge. Let us see how a pro-scientism student is likely to tackle the five problems listed above.

a/ Is “dark matter” anomalous or just little-known matter? The only way to find out what whether it exists and what it is, is to use the known theoretical and experimental tools, to catch samples of it and try to detect some of its properties. At the time of writing this is a ‘hot’ question, and there is growing consensus that dark matter is the debris left by cosmic rays when going through ordinary matter rather than tiny black holes, as had been conjectured earlier. Stay tuned.

b/ Was Lamarck right after all? In recent years, genetics and evolutionary biology have been enriched with epigenetics, the newest branch of genetics, that has shown conclusively that some experiences cause the methylation of the DNA molecule, an inheritable change. This discovery did not vindicate Lamarck: it only showed that the Darwinian schema (mutation-selection) can come in more than one version. (See, e.g., Szyf et al. 2008).

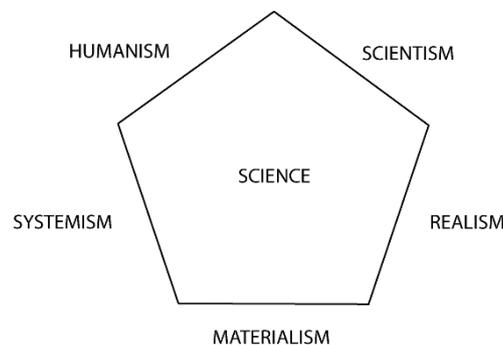
c/ Can animals be in conscious states? The popular literature is full of anecdotes about consciousness in animals of various species. But anecdotes are not hard scientific data. Some of the best such data have recently been obtained by effecting reversible thalamic and cortical inactivations – procedures that are beyond the ken of the ‘humanistic’ psychologists. It turns out that there is mounting evidence for the hypothesis that animals of various species can be conscious (e.g., Boly 2013).

d/ Can social systems be scientifically managed? Operations Research, the most sophisticated phase of management science, was born overnight from the multidisciplinary team put together at the beginning of World War II by the British Admiralty to face the great losses inflicted by the German submarines on the merchant navy that was transporting food and ammunition to England. The problem was to find the optimal size of a naval convoy. The mathematical model built by the said team, led by the physicist Patrick Blackett, showed that size to be middling, large enough to justify air coverage but not so large as to invite a fleet of enemy submarines – a result that must have disappointed the economists who love to maximize. The navy accepted this result of how newcomers to military strategy, and the naval losses decreased. This result encouraged business experts to construct mathematical models for similar problems, such as finding the optimal size of stocks (‘inventories’). Thus scientism scored another victory over the traditional or humanistic party, this time in the field of sociotechnology.

e/ Can the law become scientific? In recent years, criminology and jurisprudence, as well as their practice in the courts of law, have benefited from biology, psychology, and sociology (see, e.g., Wikström & Sampson, eds., 2006). Indeed, DNA testing is now admissible in the courts, juvenile criminal justice is slowly changing as we learn that the adolescent frontal cortex is not yet fully mature, and criminal law, as a whole, is changing as the social causes of crime are being unveiled and the rehabilitation techniques are being perfected. All these are accomplishments of scientism.

All five problems are currently being investigated on the scientific assumption that the scientific method is the royal road to objective truth and efficiency in all of the scientific and technological fields. Moreover, in all five cases more than scientism is being presupposed: realism, materialism, systemism and humanism too are being taken for granted (Bunge 2012). For instance, the study of animal consciousness assumes (a) the realist hypothesis that mental processes in the experimental animals are real rather than figments of the experimenter's imagination; (b) the materialist thesis that mental states are brain states; (c) the systemic principle that the problem under study, like all of the Big Questions, is part of a bundle of problems to be tackled anatomically as well as behaviorally; and (d) the humanist injunction to respect animal welfare – which in turn suggests refraining from prodding at random the animal's brain just to see what happens.

I suggest that all of the four above principles join scientism to constitute no less than the philosophical matrix of scientific research:



If scientific research presupposes the above-mentioned philosophical theses that characterize scientism, then this view does not oppose the humanities, as is often claimed. What the proponents of scientism oppose is the antiscientific stand adopted by Hegel, Schopenhauer, Nietzsche, Bergson, Husserl, Heidegger, the Frankfurt school, and the hermeneuticists and postmodernists. Do those enemies of rationality deserve being called 'humanists' if we accept Aristotle's definition of 'man' as 'the rational animal'?

4 What's so special about science?

Why should one prefer scientism to its 'humanistic' alternative? The usual answer is: because the scientific approach works far better than its alternatives – tradition, intuition or gut feeling (in particular *Verstehen*), trial and error, and navel contemplation (in particular a priori mathematical modeling). But this answer begets in turn the question Why does science work best?

My answer is this: scientific research works best at finding objective or impersonal truths because it matches both the world and our cognitive apparatus. Indeed, the world is not a patchwork of disjoint appearances, as Hume and Kant believed, but a system of material systems; and humans can learn to use not only their senses – which yield only appearances – but also their imagination, as well as to check it in three different ways: through observation, experiment, and consilience – or compatibility with other items in the fund of antecedent knowledge (Bunge 1967).

Besides, unlike superstition and ideology, science can grow exponentially through a well-known mechanism, namely positive feedback – where some of the output is fed back into the system. But of course, the continuation of this process requires spending close of 3% of the GDP on research and development (Press 2013) – something that politicians sold on anti-scientism won't be prepared to support.

In short, adherence to scientism has been paying handsomely, economically as well as culturally, whereas betting on anti-scientistic dogmas threatens the growth of knowledge, a process that has been going on since the Scientific Revolution.

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* Based on article in *Free Inquiry* Vol. 35, No. 1, pp. 24-31, 2015.

Readers can refer to the previous Opinion Piece on scientism in the November HPS&ST Note.