

SCIENCE AND ITS DEMARCATION IN THE LIGHT OF THE HISTORY OF IDEAS. A SHORT OUTLINE WITH APPARENT AND REAL IMPLICATIONS FOR 'APPEARANCE AND REALITY'

Helmut Pulte

Ruhr-Universität Bochum
Helmut.Pulte@ruhr-uni-bochum.de
Orbis Idearum, Vol. 1, Issue 1 (2013), pp. 105–117

The idea of 'science' (*scientia, science, Wissenschaft*) changed dramatically in the course of history: While it was understood as an epistemologically privileged endeavor from antiquity to the 19th century, the status of science and its demarcation from other intellectual activities became more and more problematic in the course of the 20th century. This outline sums up findings from 'Begriffsgeschichte' of the last 50 years and argues that history of ideas in this sense can contribute to a topical and balanced understanding of science that avoids dull scientism and a postmodernist view, which both result from a lack of determination and demarcation of science.

1. INTRODUCTION

The central questions of the following outline¹ are motivated both by the topic of this conference and by a remarkable revival: 'History of ideas' denominates a tradition of viewing and doing history which was founded by A. E. Lovejoy in the 1930ties and soon gained considerable influence. Due to a stronger social and pragmatic coining of history – at least in the sense of *historia rerum gestarum* – and other, more 'external' reasons it entered a state of crisis in the 1960ties². However, it never disappeared and regained strength during the last decade³ – though

1 This short article is an extended and slightly modified version of my introductory address 'Science and its Demarcation in the Light of the History of Ideas', presented at the founding conference 'Appearance, Reality and Beyond' of the History of Ideas Research Centre Krakow in December 2011. Many thanks to Michel Kowalewicz and the other organizers of the conference for the invitation and their kind hospitality.

2 Cf. B. Stolberg-Rielinger: "Einleitung". In: *Ideengeschichte*, ed. by id., Stuttgart: Reclam 2010, p. 7.

3 Some scarce hints must do here in order to underpin this claim: first, the publication of *New Dictionary of the History of Ideas*, 6 vols., ed. by M. C. Horowitz, New York: Charles Scribner's Sons 2005; second, the foundation of new journals like *Ideas in History* (Copenhagen: Museum Tusulanum Press 2006 ff.), *Partial Answers: Journal of Literature and the History of Ideas* (Baltimore: John Hopkins University Press 2003 ff.) and *Zeitschrift für Ideengeschichte* (Munich: C. H. Beck 2007 ff.);

not in the Lovejoyian modular design based on ‘unit ideas’, but as a more dynamical and amenable historiographical enterprise that tries to integrate social conditions and pragmatic aspects of the respective intellectual areas⁴. Thus, an historically interested philosopher of science asks *whether* – and if so, *how* – the history of ideas can contribute to an understanding of what became a widespread conviction that dominated occidental thinking from the renaissance to the late 19th century and faded away in the course of the 20th century, i. e. the belief that science uncovers ‘reality’ (as it is) while other intellectual and cultural activities like literature, art or philosophy either fail to do so or are (at least) loss-making in comparison to science. The short answer to the first question given in this outline is a qualified ‘yes’, and the even more truncated answer to the second question is ‘Begriffsgeschichte’: I understand conceptual history in a *special* sense – *Begriffsgeschichte* in the German tradition – both as a *method* and as a *discipline* of history of philosophy, of history of science and of intellectual history in general. It is no rival of the *history of ideas*, but rather a certain *mode* or *shape* of doing *history of ideas*: *Begriffsgeschichte* aims at understanding structural changes in intellectual history by analyzing the change of concepts in their linguistic context (super- and subordinated concepts, antonyms, similar concepts etc.). Thus, concepts themselves exhibit a certain temporal structure that reveals the changes and interactions of human thinking with respect to ‘matters’ or ‘objects’, i. e. to concrete or abstract referents.⁵ While *Begriffsgeschichte* has not yet developed a generally accepted canon of methods, it brought about a couple of fruitful and influential works which exemplify this approach.⁶

third, regarding the German discussion, *Ideengeschichte* regains attention in the broader historiographical debates. This is exemplified by recent publications, like C. Dutt / P. König / D. Teichert: „Die Ideengeschichte und ihre Nachbardisziplinen“. In: *Zeitschrift für Ideengeschichte* 2, (2008–1), pp. 110–112 (for the disciplinary context), A. Dorschel: *Ideengeschichte*. Göttingen: Vandenhoeck & Ruprecht 2010 (for a historical framing of the approach); N. Luhmann: „Ideengeschichte in soziologischer Perspektive“. In: *Ideenevolution. Beiträge zur Wissenssoziologie*, ed. by A. Kieserling, Frankfurt am Main: Suhrkamp 2008, pp. 234–252 (for the sociological perspective), *Die Cambridge School der politischen Ideengeschichte*, ed. by M. Muslow / A. Mahler, Frankfurt am Main: Suhrkamp 2010 (for the political context) and *Ideengeschichte der Bildwissenschaft. Siebzehn Portraits*, ed. by J. Probst / J. P. Klenner, Frankfurt am Main: Suhrkamp 2009 (for the context of picture theory and iconology).

- 4 See, for example, M. Brevir: *The Logic of the History of Ideas*. Cambridge: Cambridge University Press 2002. See for the change in question also P. Ajouri: „Lovejoy und die Folgen. Lovejoy und die Folgen. Zur Geschichte der History of Ideas“. In: *Zeitschrift für Ideengeschichte* 1, (2008–2), pp. 116–121.
- 5 Cf. R. Koselleck: „Hinweise auf die temporalen Strukturen Begriffsgeschichtlichen Wandels“. In: *Begriffsgeschichte, Diskursgeschichte, Metapherngeschichte*, ed. by H. E. Bödeker, Göttingen: Wallstein 2002, p. 37.
- 6 The most notable finished works are *Historisches Wörterbuch der Philosophie*, 13 vols., Basel / Stuttgart: Schwabe [and] Darmstadt: Wissenschaftliche Buchgesellschaft 1971–2007, *Geschichtliche Grundbegriffe. Historisches Lexikon zur politisch-sozialen Sprache in Deutschland*, 8 vols., Stuttgart: Klett 1972–1997, and *Ästhetische Grundbegriffe. Historisches Wörterbuch in sieben Bänden*, 7 vols., ed. by

A second historiographical fixation is of equal importance: As history of ideas in general, *Begriffsgeschichte*, as I understand it, is no end in itself and therefore should not be misunderstood as a form of mere antiquarianism. As any history, its aim is to shed some light on the presence and help to understand and master current intellectual problems and debates.⁷ Therefore, and without running into the pitfalls of teleological reconstructions, the *present* understanding of science will play a certain role in what follows: While the traditional understanding unduly privileged science as an epistemological enterprise, certain tendencies in contemporary science and ‘science and technological studies’ (STS), as well as certain strands of ‘historical epistemology’ influenced by postmodern constructivism harbor two dangers: either to succumb to a naïve *scientism*, which is encouraged by the irrefutable success of modern science and technology, or to ‘contextualize’ science in general terms and thereby to *downgrade* it to a hackneyed enterprise with no special epistemological merits. Between Scylla and Charybdis, a more balanced view is the order of the day.

Begriffsgeschichte may well contribute to such a view: It discriminates between science and scientism and reveals how the latter gained ground. It is also receptive to social contexts and institutional shapings of science. However, it does not follow fashion’s every whim because it brings in a greater staying power of historical grading and avoids shortsightedness as well as antiquated dogmas. History of ideas in general can help to avoid both extremes and contribute to a better understanding of science and its demarcation. The following sketch is meant to illustrate this claim. It rests on various investigations into the *Begriffsgeschichte* of science (*scientia*, science, *Wissenschaft*) from antiquity to the 20th century.

2. CLASSICAL AND MODERN SCIENCE

What can a *topical history of ideas* – in contrast to other historiographical approaches – contribute to identify and demarcate ‘science’ as a specific intellectual achievement of modern culture from other intellectual adventures? The older history generally followed traditional philosophy of science and took it for granted

K. Barck / M. Fontius / D. Schlechtenstedt / B. Steinwuchs / F. Wolfzettel, Stuttgart / Weimar: Metzler 2000. A current journal devoted to this approach is *Archiv für Begriffsgeschichte*, 54 vols., ed. by Akademie der Wissenschaften und Literatur Mainz, Bonn: Bouvier 1955–1999 / Hamburg: Meiner 2000 ff. For the ongoing historiographical discussion about *Begriffsgeschichte*, see particularly *Begriffsgeschichte, Diskursgeschichte, Metapherngeschichte*, ed. by H. E. Bödeker, Wallstein: Wallstein Verlag 2002; *Herausforderungen der Begriffsgeschichte*, ed. by C. Dutt, Heidelberg: Winter 2003; R. Koselleck: *Begriffsgeschichten. Studien zur Semantik und Pragmatik der politischen und sozialen Sprache*. Frankfurt am Main: Suhrkamp 2006. *Begriffsgeschichte im Umbruch?*, ed. by E. Müller, Hamburg: Meiner 2005, *Die Interdisziplinarität der Begriffsgeschichte*, ed. by G. Scholtz, Hamburg: Meiner 2000.

7 The historiographical implications of this presupposition are fruitfully analyzed in: A. C. Danto, *Analytical Philosophy of History*. Cambridge: Cambridge University Press 1965.

that science awards humans with a certain type of privileged knowledge: The general premise was that science generates invariable, true and indisputable knowledge of nature and man himself. *Generality, truth*, a certain *necessity* (imposed by deductive or inductive logic), *evidence* of ‘first principles’ and, in most cases, *independence* of scientific theories from heuristic methods and modes of representations are the main characteristics of ‘classical science’.⁸ Obviously, mathematical knowledge, as represented by Euclid’s *Elements*, by example, played an important role for the molding of this ideal. To put it shortly: The ‘idea of science’ from Aristotle via Bacon, Descartes and Kant to the late 19th century was shaped by the conviction that scientific knowledge is *epistémé* in the traditional sense. Though this *idea* has its roots in an *ideal* of ancient epistemology, it unfolded its strong intellectual influence not until the great ‘Scientific Revolution’ during the Renaissance took place – an element of continuity and, so to speak, of retardation hardly noticed by the scientific ‘revolutionists’ involved, but visible both in the claims they laid to scientific knowledge and in the metatheoretical reflections of classical empiricism (like Bacon’s) and rationalism (like Descartes’ or Leibniz’s).⁹

Therefore, one important aspect – probably even the most dominating one – of traditional attempts to demarcate science was to draw a line between *epistémé* in this strong sense and weaker forms of knowledge, which were not conceived as evident and certain, but as less transparent and revisable, perhaps even as fallacious

8 The distinction between ‘classical’ and ‘modern’ science applied here is strongly influenced by the conceptual histories undertaken by A. Diemer and G. König. See, above all, A. Diemer: *Was heißt Wissenschaft?* Meisenheim am Glan: Hain 1964. Id.: „Die Begründung des Wissenschaftscharakters der Wissenschaft im 19. Jahrhundert – Die Wissenschaftstheorie zwischen klassischer und moderner Wissenschaftskonzeption“. In: *Beiträge zur Entwicklung der Wissenschaftstheorie im 19. Jahrhundert*, ed. by id., Meisenheim am Glan: Hain 1968, pp. 3–62; id.: „Der Wissenschaftsbegriff in historischem und systematischem Zusammenhang“. In: *Der Wissenschaftsbegriff. Historische und systematische Untersuchungen*, ed. by id., Meisenheim am Glan: Hain 1970, pp. 3–20. Id. / G. König: „Was ist Wissenschaft?“ In: *Technik und Wissenschaft*, ed. by A. Hermann / Ch. Schönbeck, Düsseldorf: Springer 1991, pp. 3–28. König: „Naturwissenschaften“. In: *Historisches Wörterbuch der Philosophie* vol. 6, ed. by K. Gründer, Basel: Schwabe 1984, pp. 641–650. König / H. Pulte: „Theorie II. 20. Jh. (Wissenschaftstheorie)“. In: *Historisches Wörterbuch der Philosophie* vol. 10, ed. by K. Gründer, Basel: Schwabe 1998, pp. 1146–1154. Pulte: „Wissenschaft III“. In: *Historisches Wörterbuch der Philosophie* vol. 12, ed. by G. Gabriel, Basel: Schwabe 2004, pp. 921–948. Id.: „Wissenschaftstheorie, Wissenschaftsphilosophie“. In: *Historisches Wörterbuch der Philosophie* vol. 12, ed. by G. Gabriel, Basel: Schwabe 2004, pp. 973–981. Extremely useful for these kind of investigations are broader historical studies about the interactions between science and philosophy. See, above all, E. Cassirer: *Das Erkenntnisproblem in Philosophie und Wissenschaft der modernen Zeit*, 4 vols., Darmstadt: Wissenschaftliche Buchgesellschaft 1994, and J. T. Merz: *A History of European Thought in the Nineteenth Century*, 4 vols., Edinburgh: Blackwood 1896–1914.

9 For a more detailed analysis of the structural similarities of these different epistemologies with respect to scientific systems see H. Pulte: *Axiomatik und Empirie. Eine wissenschaftstheoriegeschichtliche Untersuchung zur mathematischen Naturphilosophie von Newton bis Neumann*. Darmstadt: Wissenschaftliche Buchgesellschaft 2005. pp. 29–39 and 66–75.

and deceiving. *Science*, according to the *classical* understanding, grasps the ‘essence’ of things: It was not meant to stick to mere *appearance*, but to uncover *reality*. Though most scientists and philosophers of science realized that their *idea* of science was a projected *ideal* of science, this demarcation was most often conceived as a clear-cut one.

However, the traditional image of science as an epistemologically *unique* endeavor faded away in the course of the 19th century: Science itself underwent dramatic changes, which were interpreted by many philosophers and historians as epistemological *disruptions* or insurmountable *breaks* in the process of knowledge acquisition. The rise of non-Euclidean geometries¹⁰ was an important driving force of this development, but also – and even earlier – foundational changes in mathematical physics¹¹ and a general change in the understanding of how (increasingly formal) mathematical knowledge and experience are related.¹² This fundamental change can be traced in detail by an analysis of the semantics of ‘generality’, ‘truth’ and ‘necessity’ in the respective scientific areas, and it can also be traced in individual scientific biographies and *oeuvres*. The case of Helmholtz is exemplary: At the beginning of his long and fruitful scientific career, he defended – along Kantian lines – the claim that scientific knowledge is apodictic. In his later writings, published during the last two decades of the 19th century, however, even the most basic insights of physical geometry and mathematical physics turned out to be *hypothetical* for him.¹³

The indicated developments culminated – from an epistemological point of view – in the early 20th century ‘revolutions’ in physics and a foundational crisis of mathematics. As Imre Lakatos aptly remarked¹⁴, Karl R. Popper was the first who drew the philosophical consequence of this development: More than any other philosopher of science of the 20th century, Popper criticized and eventually demolished the classical understanding of science which was based on an alleged epistemological privilege of its knowledge. He rather accentuated the opposite pole: “Our science is *not* knowledge (*epistémé*): it can never claim to have attained truth, or even as substitute for it, such as probability.”¹⁵

10 See R. Torretti: *Philosophy of Geometry from Riemann to Poincaré*. Dordrecht: Springer 1978.

11 See Pulte: *Axiomatik und Empirie*.

12 See H. Mehrtens: *Moderne-Sprache-Mathematik. Eine Geschichte des Streits um die Grundlagen der Disziplin und des Subjekts formaler Systeme*. Frankfurt am Main: Suhrkamp 1990.

13 For his changing understanding of science, see G. König: „Der Wissenschaftsbegriff bei Helmholtz und Mach“. In: *Beiträge zur Entwicklung der Wissenschaftstheorie im 19. Jahrhundert* vol. 1, ed. by A. Diemer, Meisenheim am Glan: Hain 1968, pp. 90–114. G. Schiemann: *Wahrheitsgewissheitsverlust. Hermann von Helmholtz’ Mechanismus im Anbruch der Moderne. Eine Studie zum Übergang von klassischer zu moderner Naturphilosophie*, Darmstadt: Wissenschaftliche Buchgesellschaft 1997.

14 I. Lakatos: *Philosophische Schriften* vol. 1, Braunschweig / Wiesbaden: Vieweg 1982, p. 237.

15 K. R. Popper: *The Logic of Scientific Discovery*. London: Routledge 1980, p. 278.

Modern science in this sense is not to be understood as a categorical and deductively structured system of absolute truths. Instead, it is a hypothetical-deductive system or propositions which are basically problematic¹⁶ – *problematic* in the sense that their validity always rests on disputable conditions (observations, other propositions, or theories). Modern science does no longer accept metaphysical or, to be more general, philosophical foundations, nor does it share the belief of 19th century positivism that ‘mere experience’ yields a *fundamentum inconcissum* for theory building. Modern science is *autonomous* from philosophical justification, and especially rejects the idea of ultimate justification. Therefore, its knowledge is basically *fallible* in character. Scientific *method* is understood as a means to gain intersubjective, testable results, but no longer serves as a means to ensure the infallibility of scientific knowledge.

Method in this ‘operational’ rather than epistemological sense, however, became the new criterion of demarcation in order to separate scientific and non-scientific knowledge. Many philosophical discussions in the middle of the 20th century focused on methodological issues, and Popper and other protagonists defended the special character of science mainly on this ground: *Method* not as a means to secure truth, but as a means to make scientific knowledge more reliable than ‘general knowledge’ and as a guarantee of scientific progress (in the sense of truth-approximation or *verisimilitude* as a regulative idea of any science).¹⁷ Even Thomas S. Kuhn, who rejected the idea of universal method and truth-approximation, subscribed to progress as an essential feature of the scientific endeavor and used this feature in order to demarcate scientific and non-scientific knowledge.¹⁸

Subsequently, however, and contrary to this modern but non-relativistic idea of science originated a strong tendency to *deny* that any demarcation of science and scientific knowledge is necessary or at least desirable: Paul K. Feyerabend in his *Against Method* rejected the claim that science is regulated by general methodological principles and characterized by progress: He simply proclaimed that “science is an essentially anarchistic enterprise”.¹⁹ Likewise, Bruno Latour’s appeal to “abolish the distinction between science and fiction”²⁰ seemed to make it superfluous and ‘old-fashioned’ to look for criteria which may be appropriate to separate science from other intellectual activities at all. The idea of science was, to a

16 See Diemer: „Die Begründung des Wissenschaftscharakters der Wissenschaft im 19. Jahrhundert – Die Wissenschaftstheorie zwischen klassischer und moderner Wissenschaftskonzeption“, p. 67.

17 See Pulte: „Wahrheitsähnlichkeit“. In: *Historisches Wörterbuch der Philosophie* 12, ed. by G. Gabriel. Basel: Schwabe 2004, pp. 173–174.

18 See T. S. Kuhn: *The Structure of Scientific Revolutions*. Chicago / London: University of Chicago Press 1996, esp. pp. 174–210.

19 P. K. Feyerabend: *Against Method. Outline of an anarchistic Theory of Knowledge*. London: Verso 1982, p. 17.

20 See B. Latour: „Politics of Explanation“. In: *Knowledge and Reflexivity: New Frontiers in the Sociology of Knowledge*, ed. by S. Woolgar, London: Sage 1988, pp. 155–176. A. O. Lovejoy: *The Great Chain*

certain extent, *discharged* from any special epistemic virtues. As a consequence of this epistemological *deconstruction*, science became a subject of historical and social *contextualisations* of different types – especially of historical investigations which stressed the *social* and *material* aspects of science. ‘Science and Technology Studies’ (STS) and ‘Historical Epistemology’ are influential and striking examples in this respect. These new historical trends manifest *debts* and *credits* alike, which are most obvious for STS:²¹ To the credit side certainly belongs the elaboration of science’s social character and the analysis of the role of institutional, experimental and technical influences on the formation of scientific knowledge. To the *debit side*, however, belongs the indisputable fact that they relativized and downgraded scientific knowledge in epistemological respect, which neither conforms to a thorough analysis of the reliability of this knowledge nor to man’s experience of the living environment, which today is highly determined by the (perpetually confirmed) belief in the dependability of our technological devices based on this knowledge.

Another *severe* consequence of these historiographical approaches for the traditional history of ideas is obvious: They undermine not only the epistemological authority of science, but also the idea that science is strongly shaped by overarching conceptual and methodological frameworks, which are the bearers of scientific knowledge and the main subjects of the history of ideas.

3. SCIENTISM AS MODERN OBSCURANTISM

The development sketched so far has a shady side, which – at first glance – seems to point in the *opposite* direction: The present public *understanding* of science may be low in general²², but the public *estimation* of scientific knowledge is – consciously or not – great, and sometimes elevates to religious heights. There is a *widespread* and *unconfined* trust in the statements and forecasts of science and our technological devices resting on them. Scientists are drawing bold and far-reaching conclusions from their theories, and even anti-scientific movements can count on the overwhelming but threatening success of science. In addition, parts of philosophy are tracking the ‘scientific train’ and would like to become empirical sciences

of Being. A Study in the History of an Idea. Cambridge (Mass.): Harvard University Press 1936, p. 166; cf. G. Holton: *Science and Anti-Science.* Cambridge (Mass.) / London: Harvard University Press 1993, p.153.

21 For an analysis and critique of this tradition see the papers in *A House Built on Sand. Exposing Post-modernist Myths about Science*, ed. by N. Koertge, New York / Oxford: Oxford University Press 1998.

22 For some alarming findings with respect to the United States see Holton: *Science and Anti-Science*, pp. 147–148. There is no reason to expect that the scientific illiteracy in the U. S. differs fundamentally from other ‘Western’ countries.

themselves: The growing naturalism in analytic epistemology and the philosophy of mind are very illustrative in this respect. To put it in a nutshell: The present *Zeitgeist* is not so much dominated by a critical discussion and evaluation of scientific insights, but by a new and pretty dull *scientism*.

Scientism, as I understand and use the term, is first of all a world view that is shaped by estimation of scientific knowledge and methods. As a general *wissenschaftliche Weltanschauung*, it has no derogatory meaning – as conceptual history reveals²³ –, but describes an integral world conception from the enlightenment onwards. Most often, however, scientism is used in a pejorative manner, i. e. the term is connected with the (implicit or explicit) value judgment that such a world conception is errant, perhaps even dangerous, or at least truncated or onesided. Such a value judgment may be justified for mainly two reasons: The first one is that *one* science – take physics as an historical example – is elevated above other scientific achievements in order to establish a *monistic* form of scientism that is based only on ‘internal’ (and in this sense: uncritical and dogmatic) grounds. The second one – which today is probably more widespread and influential – is that results and methods of science are extended to areas where these results and methods are by no means justified by sufficient explanatory and methodological reasons but where, nevertheless, bold conclusions are drawn from these extensions. In both cases the term ‘scientism’ is rightly used in a derogatory way, and I group them under the label ‘dull scientism’.

Dull scientism seems to me as one of the most influential of all modern forms of *obscurantism* in the Western hemisphere. Already 80 years ago, A. N. Whitehead analyzed the ongoing development as astutely as usual. His comment in *The Function of Reason* deserves to be quoted *in extenso*:²⁴

Obscurantism is the inertial resistance of the practical Reason [...] to the interference with its fixed methods arising from recent habits of speculation. This obscurantism is rooted in human nature more deeply than any particular subject of interest. It is just as strong among the men of science as among the clergy, and among professional men and business men as among the other classes. Obscurantism is the refusal to speculate freely on the limitations of traditional methods. It is more than that: it is the negation of the importance of such speculation, the insistence on incidental dangers. A few generations ago

23 For the *Begriffsgeschichte* and the more general historiography of ‘scientism’ see Ch. Demmerling: „Sziientismus“. In: *Historisches Wörterbuch der Philosophie* vol. 10, ed. by K. Gründer, Basel: Schwabe 1998, pp. 872–876. C. Hakfoort: „The Historiography of Scientism: A Critical Review“. In: *History of Science* 33, 1995, pp. 375–395, and P. Schöttler: „Sziientismus. Zur Geschichte eines schwierigen Begriffs“. In: *NTM. Zeitschrift für Geschichte der Wissenschaften, Technik und Medizin* 20, 2012, pp. 245–269.

24 A. N. Whitehead: *The Function of Reason*. Princeton: Princeton University Press 1929, pp. 34–35. The inserted quotation „By merit raised to that bad eminence“ is not emphasized in the original. It refers to John Milton’s *Paradise Lost*, Book 2.

the clergy, or to speak more accurately, large sections of the clergy were the standing examples of obscurantism. Today their place has been taken by scientists –

By merit raised to that bad eminence.

The obscurantists of any generation are in the main constituted by the greater part of the practitioners of the dominant methodology. Today scientific methods are dominant, and scientists are the obscurantists.

One of the most important dangers of obscurantism is the ‘refusal to speculate freely on the limitations of traditional methods’, and this is what characterizes dull scientism in general. Whitehead further stresses the ‘practitioner’s point of view’ and therefore charges scientists with obscurantism. This charge is, of course, in need of a qualification (as he acknowledges): Fortunately, many (if not most) scientists still understand their endeavor as a critical one and do not propagate obscurantism in the sense of dull scientism. On the other hand, Whitehead’s charge may be extended beyond the limits of scientific practitioners: Today, parts of philosophy are strongly inclined to apply results which were allegedly ‘proven and tested’ by the sciences in order to deal with genuinely philosophical problems and to ‘solve’ them. One topical example for each type of dull scientism must do here:

First, the example stemming from practiced science: Some physicists working on the *string theory* of modern theoretical physics seem to understand this theory as a modern form of mathematical metaphysics: String theory is understood and presented as a ‘unifying theory’ of all physical interactions, and thus as a physical world conception which promises the ‘end of physics’ because no more fundamental unifying theory of physics may be developed at all. Unfortunately, the physical principles of this theory are completely in the dark, and it does not allow for any testable predictions. However, some of its most prominent exponents claim that the theory is true, whether it can be backed by empirical evidence or not and whether it can be falsified by empirical evidence or not. Here, no demarcation verifiable science and traditional metaphysics seems to be available – ‘practitioner’s scientism’ at work.²⁵

Second, an example from science that currently afflicts philosophy. Cognitive scientists present colorful pictures of the human brain in order to ‘explain’ where the different intellectual faculties (or even consciousness) is located or why there is no freewill – while they define neither ‘consciousness’ nor ‘will’ in a way that clarifies why and how these human characteristics can be subject of such specific empirical investigation. Unfortunately, many representatives of present philosophy of mind are consumed by this dull scientism and even try to add ‘philosophical’

25 See R. Hedrich: „The Internal and External Problems of String Theory: A Philosophical View“. In: *Journal for General Philosophy of Science* 38, 2007, pp. 261–278 for a thorough discussion of the present problems of this theory.

grist to its mill. While there can be no doubt that cognitive science and neurosciences can yield important results for philosophy in order to understand the sensual perception and cognitive abilities of humans, there can also be no doubt about the conceptual carelessness²⁶ and the epistemological and methodological shortcomings²⁷ of many contributions to that debate as well as about the general shortcomings of philosophical naturalism as a science-based philosophical doctrine when it comes to the problem how science and non-science should be demarcated.²⁸ The dull ‘philosophical’ scientism which is so common wide-spread in the present philosophy of mind has (at least) two annoying consequences: In *systematic* respect, it is infertile because the results of empirical investigations are uncritically *redoubled* rather than analyzed from genuine philosophical points of view. This redoubling is neither helpful for the empirical sciences nor for philosophy itself. In *historical* respect, it is to a great deal superfluous because it redoubles – unwittingly of course, i. e. due to a lack of historical education – controversies and doctrines of the past history of ideas as, *inter alia*, the *Ignorabimus*-discussion illustrates.²⁹ This redoubling is irritating for the empirical scientist and boring for the learned philosopher. The history of ideas might have been help-ful to avoid detours and blind alleys of recent discussions, but obviously is not present in the narcissistic discourses which take place in the present philosophy of mind.

Dull scientism in present science and philosophy is an unconsidered heritage from *classical*, but not from *modern* science: It shares the (implicit) assumption that asserted scientific knowledge is privileged or unique (for reasons whatsoever), and therefore is not in need of epistemological criticism and methodological reflection, but deserves benevolent interpretation and speculation about assumed consequences. As it holds the view that all our knowledge is based on science and since it rejects the existence of genuine philosophical problems and methods, it

26 For a thoughtful analysis of this shortcoming, see P. Janich: *Kein neues Menschenbild. Zur Sprache der Hirnforschung*. Frankfurt am Main: Suhrkamp 2009.

27 Especially in the ‘free will-debate’; cf. B. Falkenburg: *Mythos Determinismus. Wieviel erklärt uns die Hirnforschung?* Heidelberg: Springer 2012.

28 See, for example, the accurate analysis in G. Keil / H. Schnädelbach: *Naturalismus. Philosophische Beiträge*. Frankfurt am Main: Suhrkamp 2000, esp. pp. 38–44.

29 In this controversy of the late 19th century, provoked by Emil Du Bois-Reymond’s *Grenzen des Naturerkenntnis* from 1872, Friedrich Albert Lange played a considerable role. It was to a great deal an epistemological discussion about the problem how mental properties and qualities can be explained. Michael Pauen sums up a notable analysis of the ‘historical’ discussion and recent developments in philosophy of mind like this: “A diagnosis of the problem that largely anticipates the present discussion can only be found in Lange and Du Bois-Reymond. This holds especially for the demarcation of the epistemological problem of the explanation of mental properties and the metaphysical problem of identification of mental and physical properties.” See M. Pauen: „Die Grenzen des Erkennens. Von Du Bois-Reymond zur aktuellen Philosophie des Geistes“. In: *Weltanschauung, Philosophie und Naturwissenschaft im 19. Jahrhundert*, vol. 3: *Der Ignorabimus-Streit*, ed. by K. Bayertz / M. Gerhard / W. Jaeschke, Hamburg: Meiner 2007, pp. 151–182.

has a simple answer to the problem of how to distinguish between ‘appearance and reality’: Science is the ‘royal road’ to reality, and there is no place for appearance.

Seen from this angle, dull scientism ironically enough shares a characteristic with the postmodernist tradition of epistemologically downgrading science, which was described as a problematic and unwelcome consequence of *modern* science earlier: The latter tradition, stressing the *constructivist* (and in so far ‘apparent’) character of all scientific achievements, is *neither* interested in a reflection and definition of proper limits of science. In so far as both opposed positions fail to determine science – as a central subject of both parties – and its demarcation, both can be described as ‘ideological’ from the point of view of philosophy of science.

4. CONCLUSION: THE ROLE OF HISTORY OF IDEAS

I would like to sum up and to draw some conclusions with respect to the central questions I started with. *Science* is not the ‘royal road’ to the understanding of reality. *Science* is neither an arbitrary parlor game of modern civilization, nor is it primarily an instrument to exert power, nor can it be reduced to its material practices and technological applications. In order to enable science to yield an important contribution to an understanding of reality, its epistemological premises, the reliability of its methods, the range of its consequences and the legitimacy of its techniques and operations constantly have to be checked and evaluated. This is partly a business of science itself, but partly also a non-scientific task that involves philosophical, historical, sociological and other epistemological interests and methods. In this sense, science is not ‘autonomous’, and never will be. However, scientific interests, as I understand them, are not alien to such interests, but akin: Science, as the legitimate heritage of traditional philosophy of nature is striving for a theoretical understanding of nature and man’s place in nature. The aim of proper science is to transcend the *appearance* of things and to gain reliable theoretical insight into *reality*. In order to achieve this aim, science itself must be interested in the range of its own possibilities and limits. It is the *neglect* of this character of science which causes many of the confusions about science in modern civilization.

This outline is a plea for integrating the history of ideas into this common project. To be sure: Topical history of ideas cannot turn back the clock and should not try to do so. Neither can we return to Lovejoy’s ‘unit-ideas’ as a historiographical key, nor can we restore the traditional ideal of ‘science’ as *epistémé*. This would be vain and historically uninformed attempts. What we need is a history of ideas that takes the social and material aspects of science seriously without giving up the leading idea that science is an intellectual venture that, first of all, does not aim at

power. Rather, it is a pursuit for *truth*, a regulative idea. A history of ideas in this sense has to uncover the leading conceptual frameworks of science, which often originate from metaphysics, and it has to show how they were transformed into empirical, testable and confutable science. It *also* has to uncover the leading methodological principles and epistemic virtues of science and how they are adapted to specific social and material circumstances.

This business can only be done successfully if the history of ideas itself pays special attention to the demarcation problem. *In turn*, this problem can successfully be dealt with only if some *normative* requirements are accepted: Whether scientific claims in concrete contexts are accepted as ‘scientific’ or not depends on the existing conceptual framework, the intentions involved in the particular scientific activity, the accepted and applied methodology in relation to these intentions, the regard of contextual obstacles and opportunities, and the testability of the achieved results. Of course, all this *can* and *must* be spelled out for the historical contexts in question, but these exercises are neither mysterious nor condemnable.

I think that history of ideas can do *more* for a better understanding of present science and its demarcation. If it does not dissolve the ‘idea of science’ by unconditional contextualization, and thus put at risk its *instructive potential* for the present, it *can* draw parallels between the present situation of science and former periods with comparable confusions *about science*. For example, materialism at the end of the 18th century and in the second half of the 19th century as well as the extensive *Ignorabimus*-debate in the late 19th and early 20th century reveal striking similarities to modern *scientism*: overdrawn expectations and claims, tendencies to treat philosophical problems with scientific means, and epistemological *cul-de-sacs* as consequences of the attempt to capture the ‘totality of experience’ by a single science. It would be a triviality to say that history does not repeat itself. But it is plausible to say that the history of science repeats certain *patterns of thinking*. The history of ideas *can* and *should* draw some lessons from this for *present* discussions *about* science and *in* science. Understood in this sense, it is by no means part of a postmodern intellectual movement, as it is presented by some of its contemporary representatives. On the contrary, it is part of a continuing process of enlightenment. Therefore, this short outline will end with Immanuel Kant, whose whole project of *Erkenntniskritik* implied both the necessity and possibility of demarcation of what he distinguished as the best of our knowledge, i. e. science:³⁰

[...] however, the very same principle, that everything in natural science has to be explained *naturally*, at the same time designates the limits of science. Be-

30 I. Kant: *Über den Gebrauch teleologischer Prinzipien in der Philosophie* (1786). *Kants Werke. Akademie-Textausgabe* vol. VIII, Königlich Preußische Akademie der Wissenschaften, Berlin: de Gruyter 1968, pp. 178–179.

cause one has reached its outmost limit when – under *all* explanatory reasons – one uses the last one which is still verified by *experience*. Where this ends, and one tries to do so [i. e. to explain] by powers of matter imagined by oneself, being subject to egregious laws not capable of any evidence, one has already transcended science [...].