

THE TRANSPARANCY OF DISENCHANTMENT

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1. Introduction¹

Thus far, scientific knowledge has destroyed existing cultural meanings without creating any new ones. At best, it has provided material for creating new meanings.² Max Weber described this cultural nihilism concerning meaning—albeit not in this terminology—as part of a culture- and epoch-transcending process of rationalization whose results he called “disenchantment” (*Entzauberung*), a term which since then has become emblematic of modernity.³ I concur with Weber’s pointed characterization of

1 I would like to thank Dr. Ciaran Cronin for his excellent translation of the German original and an anonymous reviewer for criticisms and suggestions for improving the text, which I gladly followed.

2 The concept of meaning refers to different object domains. Motivational practical meaning, for instance, or meaning as intentional semantic understanding can be distinguished from cultural meaning. Jürgen Habermas’s idea of an emancipatory science that contributes to overcoming coercive social relations through reflection on its own epistemic conditions is an example of a position that rejects the thesis that science necessarily leads to the destruction of cultural meaning. See Jürgen Habermas, *Knowledge and Human Interests* (Boston: Polity Press, 1972). Among those who argue that science destroys meaning is Ray Brassier, who describes this process as “the most far-reaching (and still ongoing) intellectual revolution of the past two thousand years”: Ray Brassier, *Nihil Unbound: Enlightenment and Extinction* (Houndsmills: Palgrave, 2007), xi.

3 Weber makes a connection between disenchantment and the destruction of meaning. See, e.g., Max Weber, *Wirtschaft und Gesellschaft: Grundriss der*

cultural meanings as magic. Cultural meaning, whose distinguishing feature is its normative contents, traditionally assumes the form of magic and religion, as well as of unifying world interpretations that are not necessarily religious in character. Weber uses the term “enchantment” or “magic” (*Zauber*) in its narrow sense to refer to the recognition of not rationally demonstrated assertions and non-sensually experienceable entities that nevertheless have practical relevance.⁴ However, the historical success of the concept of disenchantment can be traced back to the broad meaning of “enchantment” or “magic”, by which is meant a quasi-magical attractive force or a mysterious radiance that lends things a distinctive allure. Disenchantment then means that the world of appearance loses its fascination and unquestionable relevance for human beings.

Disenchantment is not a product of science alone, but arises from a social process of the imposition of rational orders that also initially includes certain forms of religion. Its result is the differentiation and autonomization of distinct sub-domains of society and culture. Under conditions of advanced rationalization, however, science plays the leading role in the ongoing process of disenchantment.

It is true that the period of the effective cultural dominance of magical ideas lies far in the past and that religion now enjoys limited public influence in the majority of industrialized societies. However, spiritual beliefs still play a role in modern societies as elements of patterns of orientation and forms of identification.⁵

verstehenden Soziologie, ed. Johannes Winckelmann (Tübingen: Mohr, 1972), 308 and Max Weber, *Gesammelte Aufsätze zur Religionssoziologie*, Vol. I (Tübingen: J. C. B. Mohr, 1922), 563. However, some authors have claimed that disenchantment leads, not to the destruction, but to the creation of meaning: Johannes Winckelmann, “Die Herkunft von Max Webers ‘Entzauberungs’-Konzeption”, *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 32, no.1 (March 1980), and Manfred Frank, *Conditio moderna: Essays, Reden, Programm* (Leipzig: Reclam, 1993).

4 Max Weber, *The Religion of India: The Sociology of Hinduism and Buddhism*, trans. and ed. Hans H. Gerth and Don Martindale (Glencoe, IL: Free Press, 1958), 336.

5 Charles Taylor, *A Secular Age* (Harvard: Harvard University Press, 2007), 505–538.

Sometimes their influence is even claimed to be on the rise again and there is talk of a re-enchantment of the world.⁶ But spiritual beliefs are also subject to the process of differentiation and autonomization.

As controversial as the cultural relevance of disenchantment may be, there can be no doubt about the prominent role that science plays in this process. There is no place for the constitutive components of cultural meanings in scientific knowledge.⁷ Scientific knowledge – it will be assumed here – is distinguished by systematicity, intersubjectivity and verifiability in accordance with strict rules.⁸ It has an objective character, by which is meant not only the independence of knowledge from individual factors such as the attitudes, opinions, or convictions of individual persons. Objectivity also denotes a property of the description of facts that on account of their epoch- and culture-transcending character escape the control of human action, without thereby being historically unchangeable. Scientific knowledge is permeating more and more domains of human reality and is increasingly closely interwoven with technical applications that are indispensable for the organization of human life.

However, it would be insufficient to describe the cultural nihilism concerning meaning at work here solely in terms of the negatively connoted concept of disenchantment. The fact that until now science has merely destroyed existing cultural meanings, without producing any new ones, must be attributed to additional

6 Serge Moscovici, “Die Wiederverzauberung der Welt”, in *Jenseits der Krise: Wider das politische Defizit der Ökologie*, ed. Alain Touraine et al. (Frankfurt am Main: Syndikat, 1976), Frank, *Conditio moderna*, and Richard Jenkins, “Disenchantment, Enchantment and Re-Enchantment: Max Weber at the Millennium”, *Max Weber Studies* 1, no. 1 (2000), <http://www.jstor.org/stable/24579711>.

7 The thesis that cultural meanings influence scientific knowledge is only upheld by marginal positions in the philosophy of science, such as the so-called Strong Program in the sociology of knowledge.

8 This characterization of scientific knowledge implies neither that it is value-free nor that it is context-independent. On the value-laden character of scientific knowledge, see section 3 of the present paper; on its context-dependent character, see footnote 11.

positive features of scientific knowledge.⁹ Science itself is subject to differentiation and autonomy, which is reflected in the specialization of its disciplines and restricts the validity of the knowledge produced by the respective disciplines to selected areas of reality. Characteristic of scientific knowledge are certain ways of explaining objects in the material world and of understanding objects with meanings.¹⁰ A phenomenon has been scientifically explained or understood when it has been described in a reproducible way and its conditions of occurrence and dynamics of development have been comprehended and placed in a theoretical context. In short, scientific knowledge has reached its goal regarding an object when no factor is missing that is required to rationally reconstruct the knowledge and the changes it undergoes. This does not require the kind of normative evaluation provided by cultural meaning. However, practical contexts determine the more detailed conditions for fulfilling the relevant criteria of scientific explanation and understanding, which also undergo historical change.¹¹

Despite this variability, one can specify context-independent paradigmatic examples of successful processes of scientific cognition. A disease has been scientifically explained when it has been adequately defined by specifying its characteristics, when the conditions under which it occurs and the course it takes have been clarified in line with other relevant knowledge, and when as a result the treatment options have as a general rule also been specified. The flow of a liquid counts as having been explained when it has been characterized in terms of physical variables that can be related to those of other theories and when its initial and boundary conditions, as well as the mathematical relationships in terms of which it can be described, are known. A meaning is deemed to be

9 I discuss the future possible conditions of the production of cultural meaning by the sciences in section 5.

10 On the distinction between explanation and understanding in the philosophy of science, see Paul Hoyningen-Huene, *Systematicity: The Nature of Science* (New York: Oxford University Press, 2013), 53–56.

11 On the context-dependence of knowledge, see Michael Williams, *Unnatural Doubts: Epistemological Realism and the Basis of Scepticism* (Princeton, NJ: Princeton University Press, 1996).

understood when it exists in the form of a reproducible utterance and the context in which it occurs and the relevancies of its possible interpretation have been determined.

In general, it can be assumed that the scientific explanation and understanding of phenomena is a process that can be concluded approximately or completely, if one considers the development of scientific knowledge over an extended period of time. In modern times, it has been conjectured, contrary to the claim that the progress of knowledge is unlimited, that scientific knowledge of individual domains of phenomena, and perhaps even the scientific enterprise as a whole, can be brought to a conclusion.¹² In my view, Werner Heisenberg's conception of closed theories provides a model for how scientific knowledge as a whole unfolds. According to Heisenberg's conception, this process can arrive at an overall comprehension of reality that is no longer regarded as susceptible of significant improvement. Once it has been concluded, scientific knowledge leaves behind a transparency that is scarcely in need of supplementation.¹³

I call the cognitive state achieved through scientific explanation or understanding "epistemic transparency of the sciences" or "scientific-epistemic transparency." This expression stands in the tradition of the classical justification of science, according to which scientific knowledge transforms the unknown into the known. The known—as that which is taken-for-granted—is, as it were, transparent because it does not require special attention. "Transparency" takes up the metaphor of light, according to which science removes the darkness that stands in the way of knowledge.

12 Nietzsche already thought that in the sciences "everything essential has been discovered and only a pitiful late remainder is left for the seeker to cull." Then science would no longer stand "in stark contrast to grey and tedious error." (Friedrich Nietzsche, *Human, All Too Human: A Book for Free Spirits*, trans. R. J. Hollingdale [Cambridge: Cambridge University Press, 1996], 121). In section 5 below I discuss arguments concerning the finiteness of scientific progress.

13 On Werner Heisenberg's conception of closed theories, which is tailored to physical disciplines, see Gregor Schiemann, *Werner Heisenberg* (Munich: C.H.Beck, 2008), 70 ff. and 116 f.

With the removal of epistemic opacity it becomes more difficult for magical and religious belief systems to compete with scientific knowledge. Currently, the differentiation and autonomization of the sciences ensure that rationally understood objects remain so specialized that they cannot serve as a basis for a comprehensive foundation of meaning.

Epistemic transparency does not only assume a scientific form. For example, explanations and processes of understanding that lack the conditions of reproducibility and integration into a theoretical context can give rise to a cognitive condition of transparency that does not satisfy the criteria of scientific objectivity. Transparency exists at an everyday practical level when the conditions for the occurrence and change of phenomena are known. I conceive of epistemic transparency as a precondition of public transparency, where by the latter is meant the general accessibility of information, that is, of data and knowledge. "Accessibility" includes not only the possibility of obtaining information, but also the requirement on social actors to disclose the information that underlies their actions. Someone who has information is generally also in a cognitive state that allows her to explain or understand the objects of her knowledge. Non-scientific epistemic transparency, conversely, will not be public when its lack of objectivity prevents it from being generally accessible. Scientific-epistemic transparency, on the other hand, is public at least insofar as anyone can in principle acquire the knowledge that makes it possible.

The concept of scientific-epistemic transparency can incorporate essential features of disenchantment. Like disenchantment, transparency is incompatible with magic, miracles and secret knowledge. It aims at a rational comprehension of the world as a prerequisite for shaping reality in purposeful ways and it has no need of any culturally endowed meaning. Scientific-epistemic transparency can be understood as the dominant modern form of disenchantment.

The social dimension of disenchantment and scientific-epistemic transparency can be discussed using the example of the lifeworld. According to Weber, the process of rationalization does

not come to a halt before the lifeworld. Although for Weber the special characteristic of “value freedom” (*Wertfreiheit*) sets scientific knowledge apart from other forms of knowledge, he does not make a clear separation between scientific and everyday knowledge. This lack of differentiation can be traced back in part to the elements of Weber’s conception of modernity that are grounded in a critique of culture.¹⁴ In order to demarcate the lifeworld as a non-scientific field of experience I draw upon the social phenomenology of Alfred Schütz.¹⁵ In contrast to the nonintuitive, questioning character of scientific knowledge, lifeworld knowledge is distinguished by the immediacy of its contents and the taken-for-grantedness with which it understands its objects. In modernity, the lifeworld is not so much a source of disenchantment and epistemic transparency; instead it finds itself confronted with these forms of meaning-destroying conceptions of the world. Speaking with Husserl, science “excludes in principle precisely the questions which man, given over in our unhappy times to the most portentous upheavals, finds the most burning: questions of the meaning or meaninglessness of the whole of this human existence.”¹⁶

In what follows, I will develop further the argument that today scientific-epistemic transparency is the primary source of disenchantment. In order to understand epistemic transparency as a scientific form of disenchantment, Weber’s concept must be subjected to critique. On the one hand, Weber extends the concept of disenchantment in an inadmissible way when he fails to

14 Weber’s conception of modernity contains not only elements of a critique of culture, but also universalistic elements. On this, see Habermas, *The Theory of Communicative Action*, 2 vols., trans. Thomas McCarthy (Boston: Beacon Press, 1984, 1987), Vol. I, 178–185.

15 For a more detailed account of the features of the lifeworld, see Gregor Schiemann “One Cognitive Style Among Others: Towards a Phenomenology of the Lifeworld and of Other Experiences”, in *The Multidimensionality of Hermeneutic Phenomenology*, eds. Babette Babich and Dimitri Ginev (Dordrecht: Springer, 2013), 31–48, https://doi.org/10.1007/978-3-319-01707-5_3.

16 Edmund Husserl, *The Crisis of European Sciences and Transcendental Phenomenology: An Introduction of Phenomenological Philosophy*, trans. David Carr (Evanston, IL: Northwestern University Press, 1970), 6.

separate it clearly from lifeworld knowledge. However, from his concept one can glean elements that can serve as pointers for a concept of the lifeworld different from science (2). On the other hand, Weber restricts disenchantment when he claims that scientific knowledge is not able to grasp value-formation and decision-making processes. In order to understand epistemic transparency as a scientific form of disenchantment, the latter must be defined differently from Weber (3). The concept of transparency defended here must be demarcated in contemporary discourse from other conceptions that place too narrow limits on the objectivity of scientific-epistemic transparency or reject it entirely (4). Regarding the epistemic transparency of the sciences, I assume that it is not self-limiting, that is, that it proceeds from the scientific notion that all phenomena in the world of experience can be understood. If a comprehensive scientific theory of the world existed, it might also be able to found culturally sustainable dimensions of meaning (5). In contrast to epistemic transparency, limits must be placed on public transparency, because releasing information might be neither politically, nor legally nor morally justifiable (6). Finally, the paper will give an overview of the main conclusions (7).

2. Transparency as scientific disenchantment

Pointers to a close relationship between disenchantment and transparency can already be found in Weber's account of the history of the process of disenchantment. This can be reconstructed as a three-stage sequence comprising the establishment of "mythological-magical modes of thought," the beginning of its religious-scientific disenchantment and the subsequent exclusively scientific disenchantment to which religion falls prey as irrational belief.¹⁷

Weber correctly locates the beginning of religious and scientific disenchantment in the ancient world and points to the role

17 Wolfgang Schluchter, *Die Entzauberung der Welt: Sechs Studien zu Max Weber* (Tübingen: Mohr Siebeck, 2009), 3 ff.

played by “Hellenic scientific thought.”¹⁸ The example of Aristotle’s formative influence on subsequent ancient thought provides evidence of the unity of disenchantment and epistemic transparency in the justification of classical science, which remains influential to the present day. Aristotle describes scientific knowledge as a path “from that which is more familiar to us but more unfamiliar by nature, to that which is more familiar and clearer by nature but is unknown to us.”¹⁹ Human beings acquire knowledge by explaining what is unknown to them in terms of what they already know, that is, by creating transparency.²⁰ At the same time, the Aristotelian conception of science represents an important step in the disenchantment of the understanding of the world. Whereas in earlier philosophy (e.g. Plato’s) the world existed only in virtue of its direct participation in the divine ideas, in Aristotle it owes nothing to the divine except its infinitely distant first cause, a part of the rational soul and the infinitely distant goal of all movement.

Weber mistakenly believes that religious and scientific disenchantment finds “its logical conclusion” in ascetic Protestantism.²¹ As already noted, the continuing and perhaps even resurgent influence of spiritual beliefs indicates that the critique of mythological-magical modes of thought has not yet—and possibly cannot—come to an end. Ascetic Protestantism may therefore be seen, not as the conclusion, but as the climax of a special historical episode of these modes of thought. This episode was directed at the “rationalization of individual life,” and hence also of the space

18 Weber, *The Protestant Ethic and the Spirit of Capitalism*, trans. Talcott Parsons (London and New York: Routledge, 1992), 61.

19 Wolfgang Wieland, *Die aristotelische Physik: Untersuchungen über die Grundlegung der Naturwissenschaft und die sprachlichen Bedingungen der Prinzipienforschung bei Aristoteles* (Göttingen: Vandenhoeck & Ruprecht, 1962), 70.

20 Aristotle was not yet aware of any extension of the scope of already familiar knowledge, as presupposed by the concept of transparency introduced here.

21 Weber, *The Protestant Ethic and the Spirit of Capitalism*, 61. Under the heading of ascetic Protestantism, Weber includes, among others, Calvinists, Puritans, Pietists, Methodists, Anabaptists, Baptists, Mennonites and Quakers. See Schluchter, *Die Entzauberung der Welt*, 8.

of experience of the lifeworld.²² Mythological-magical ideas were systematically banned from everyday practice in the Protestant interest in one's own salvation, which can only be achieved as an obedient tool of God. In Weber, therefore, the lifeworld appears alongside science as the basis of disenchantment. In fact, he assumes that disenchantment at the social level progresses to the extent that individuals also orient their actions rationally in everyday practice.²³ However, the rationalization of the lifeworld also has limits for Weber. The more comprehensive social rationalization becomes, the weaker it becomes at the level of everyday practice from which it proceeded. In everyday life, according to Weber, the institutionalization of rational orders leads to the prevalence of "consensual conformity to what is habitual, what is familiar, what one is brought up to do, what constantly recurs ... that type of behavior ... of more or less approximately uniform mass action without any meaning-relatedness."²⁴

Weber's assertion that the lifeworld keeps its distance from rationalization, for which there is textual evidence, is problematic insofar as he attaches a negative evaluation to this distance-taking. He does not accord it any independent status, but bases it instead on unreflected adaptation to the unquestioningly accepted rationalization processes described as conformity or submissiveness (*Fügsamkeit*).

The lack of a clear determination of the relationship between lifeworld experience and scientific knowledge is also a feature of what is probably Weber's most well-known definition of disenchantment under conditions of advanced scientific domination:

Rationalization does not mean a general increase in our knowl-

22 Weber, *Religionssoziologie I*, 163 ff. and Weber, "Religious Rejections of the World and Their Directions", in Weber, *From Max Weber: Essays in Sociology*, ed. and trans. H. H. Gerth and C. Wright Mills (New York: Oxford University Press, 1946), 338–339. Weber does not use the expression 'lifeworld' here.

23 Max Weber, *Collected Methodological Writings*, ed. Hans Henrich Brunn and Sam Whimster (London and New York: Routledge, 2012), 289.

24 *Ibid.*, 300.

edge of the conditions under which we live our lives. Rather, it means something else: the knowledge, or the belief, that *if we wished to*, we *could* at any time learn about the conditions of our life; in other words: that, in principle, no mysterious and unpredictable forces play a role in that respect, but that, on the contrary, we can—in principle—*dominate* everything by means of *calculation*. And that, in its turn, means that the world has become disenchanted. Unlike the savage, for whom those forces existed, we no longer need to resort to magical means in order to dominate or solicit the spirits. This can be done by technical means and calculation. This, above all, is the meaning of intellectualization as such.²⁵

Disenchantment on this definition is narrower in scope than scientific-epistemic transparency, because it is skewed in a one-sided way to calculability, which is not necessarily the goal of explanations and processes of understanding. In spite of this narrowness, the definition nevertheless remains vague in two respects. On the one hand, “knowledge of the conditions under which we live” is not assumed to be actually given, but instead to be possible. On the other hand, the notion applies as much to knowledge of this possibility as to mere belief in it. In this context, knowledge and belief denote two potentially contradictory alternatives. The knowledge of being able at any time to learn about “a general increase in our knowledge of the conditions under which we live” presupposes that the conditions for this knowledge have already been fully clarified. Belief, on the other hand, can be more or less justified.

Taken together, these two ambiguities permit different interpretations of Weber’s definition. Disenchantment could be a matter of an insufficiently grounded conviction, such as occurs in non-scientific contexts, the lifeworld included, when the competence to judge the state of scientific knowledge of an object domain is lacking. Since Weber adopts a critical stance toward science,²⁶

25 Ibid., 342 (translation amended; emphasis in original).

26 Ibid., 343: “The theoretical constructions of science are an unreal world where artificial abstractions try to grasp the lifeblood and sap of real life

however, he might also want to express the idea that scientifically demonstrated disenchantment does not necessarily have any real content. It would be a misconception, not of laypersons, but of experts who overestimated the scope of their science. Finally, however, Weber's definition of disenchantment can also be understood to mean that the extent of scientific knowledge achieved thus far justifies the general assumption that no experienceable object is in principle beyond its reach.

In the latter interpretation, the difference between knowledge and belief is minimized and disenchantment and transparency in part coincide. The belief in possible disenchantment is sufficiently well-founded that it approaches the status of knowledge as a true warranted conviction, whereby the justification can differ according to context. Scientifically speaking, it can rely on previous experience of the application of a scientific method ("technical means and calculation"), whereas from the perspective of the lifeworld it can appeal to experience of the application of scientific knowledge. For science, which forbids knowledge that refers to mysterious forces, disenchantment and transparency coincide. That is not necessarily true of the lifeworld. There, on the one hand, forces that as yet cannot be rationally explained can still be considered effective, alongside the scientific knowledge for good reasons exist. On the other hand, the lifeworld can also be drawn into processes of disenchantment through the rationalization of its action, independently of its stance on scientific explanations and processes of understanding.

Weber's concept of disenchantment thus enables us to differentiate between science and the lifeworld in a way that is required to apply context-specific meanings of the concept of epistemic transparency as forms of disenchantment. Furthermore, the discussion of Weber's definition of disenchantment has alluded to the fact that it should not only be understood as calculating knowledge if it is to count as a form of transparency.

with their wizened hands, but never succeed in catching hold of them" (translation amended).

3. The scope of epistemic transparency

A further enlargement of the scope of the concept of disenchantment, without which it cannot cohere with the leading role of science in the process of disenchantment, concerns the inclusion of values and norms. With the requirement of “value freedom” he places on science, Weber asserts that a distinguishing feature of scientific knowledge by comparison with other modes of knowledge is that its assertions do not depend on values and do not have any norm-setting power. Although science can make values objects of its investigation, he argues, it cannot establish values itself.²⁷ According to Weber, values are results of individual achievements and objects of private decisions. Although both norms and values are capable of intellectual and rational elaboration, they cannot be fully justified.²⁸ The fact that as a result values may not be included in scientific findings is already sufficient for a transparency requirement implicitly presupposed by Weber, which values cannot satisfy because of their opacity. Conversely, values as objects of scientific knowledge cannot be threatened in their subjectivity. The strict separation between objective science and subjective evaluation can be traced back to Weber’s neo-Kantian background.²⁹ For him, one characteristic of disenchantment is precisely the freedom of scientific knowledge from values and thus from meaning.³⁰

27 Max Weber, “The ‘Objectivity’ of Knowledge in Social Science and Social Policy”, in Weber, *Collected Methodological Writings*, 100–138. In what follows, by values I understand judgments about the goodness of states, and by norms principles of action that aim to realize a certain behavior. Values differ from norms in having a more indirect reference to human action. Since norms presuppose values, the properties of the latter also apply to the former.

28 On the subjectivity of the formation and positing of values, see Max Weber, “The Nation State and Economic Policy”, in Weber, *Political Writings*, eds. Peter Lassman and Ronald Speirs (Cambridge: Cambridge University Press, 1994), 18–19; as well as Weber, *Wirtschaft und Gesellschaft*, 242; and Weber, *Religionssoziologie I*, 537.

29 Habermas, *Theory of Communicative Action, Vol. I: Reason and the Rationalisation of Society* (Cambridge: Polity, 1991), 186.

30 For Weber, values are a prerequisite for the creation of meaning; see Hans-Peter Müller, “Rationalität, Rationalisierung, Rationalismus”, in *Max*

Against Weber it must be objected that objectivity and subjectivity are not uniformly distinguishable.³¹ Although the reproducibility of scientific knowledge calls for independence from individual subjectivity, there can be no doubt about the objectively existing close interrelationship between scientific knowledge and values. Epistemic, ethical and social values enter into the process of scientific cognition, which in turn influences and in part also triggers the formation and change of these different types of values.³² Processes of value formation and change are not exclusively the subject matter of the humanities, but increasingly also of empirical disciplines such as psychology, research on evolution, anthropology and neuroscience. These types of empirical research systematically adhere to a scientific program according to which the world of experience, including mental and cultural phenomena, can be scientifically described, explained or understood, and changed.

The naturalistic variants of this program strive to overcome the object-subject split by trying to grasp all phenomena as natural phenomena. Reductive naturalism attempts to reduce semantic phenomena to material processes and trace processes of understanding back to explicable physio-chemical mechanisms. Weber's concept of explanation lends support to reductive naturalism through its restriction to causal explanations, which he regards as

Weber-Handbuch: Leben—Werk—Wirkung, eds. Hans-Peter Müller and Steffen Sigmund (Stuttgart and Weimar: Metzler, 2014), 102; and Karl Löwith, "Die Entzauberung der Welt durch Wissenschaft. Zu Max Webers 100. Geburtstag," *Merkur* 18.196 (1964), https://volltext.merkurzeitschrift.de/journal/mr_1964_06.

31 That subjectivity and objectivity—or, similarly, values and facts—cannot be distinguished in a uniform way is a widely held view in contemporary philosophy of science. Relevant discussions are: Richard Rudner, "The scientist qua scientist makes value judgments," *Philosophy of Science* 20.1 (1953): 1-6, Helen E. Longino, *Science as Social Knowledge: Values and Objectivity in Scientific Inquiry* (Princeton: Princeton University Press, 1990), Hilary Putnam, *The Collapse of the Fact/Value Dichotomy and Other Essays* (Cambridge/London: Harvard University Press, 2002).

32 A relevant introduction to the relationship between science and value is provided by Martin Carrier, *Wissenschaftstheorie zur Einführung* (Hamburg: Junius, 2006).

the epitome of the destruction of meaning:

The tension between religion and intellectual knowledge definitely comes to the fore wherever rational, empirical knowledge has consistently worked through to the disenchantment of the world and its transformation into a causal mechanism. For then science encounters the claims of the ethical postulate that the world is a ... somehow *meaningfully* and ethically oriented cosmos. In principle, the empirical as well as the mathematically oriented view of the world develops refutations of every intellectual approach which in any way asks for a ‘meaning’ of inter-worldly occurrences.³³

With the phrase “meaningfully and ethically oriented cosmos,” Weber is referring to values and norms. It expressed the idea that the world is worth preserving and is part of a natural order which prescribes norms to action. Science, according to this conception, is not only independent of values, but also rejects their thematization. It creates a world without meaning.

In order to understand epistemic transparency as a scientific form of disenchantment, we must reject the postulate of value freedom as formulated by Weber. The production of epistemic transparency also includes values and exerts effects on scientific knowledge itself insofar as it depends on values.

4. The objectivity of transparency – The relationship to other ways of understanding transparency

The foregoing reflections have shown that, while Weber’s concept of disenchantment and the concept of transparency ex-

33 Weber, “Religious Rejections of the World and Their Directions”, 350–351. The expression “causal mechanism”, which Weber uses to characterize the scientific comprehension of the world, has preserved its outstanding importance in the philosophy of science to the present day, as is shown by the growing influence of the New Mechanism. See Stuart Glennan and Phyllis Illari, eds., *The Routledge Handbook of Mechanisms and Mechanical Philosophy* (Abingdon and New York: Routledge, 2017).

hibit differences, they overlap, or can be brought to overlap, in their meanings. Like disenchantment, transparency leaves no room for magic, miracles or secret knowledge and disenchantment can generate transparency. Thus far, disenchantment and transparency have destroyed existing cultural meanings without replacing them with anything. In order to analytically grasp the leading role of science in this process, I have introduced the concept of scientific-epistemic transparency, which, with its positive feature of being the result of explanations actually undertaken or of processes of understanding actually carried out, is more clearly marked off from non-scientific knowledge than disenchantment. Moreover, the potential scope of this knowledge is larger than that of potential disenchantment knowledge, if the latter is restricted to calculating knowledge and is tied to the postulate of value freedom.

Epistemically transparent scientific explanations and processes of understanding are rich in theoretical presuppositions; they exist in specialized form and, in spite of these peculiarities, are generally verifiable and capable of being learned. They satisfy criteria of objectivity according to which the truth is independent of personal factors such as individual attitudes, opinions and convictions. In this respect, the meaning of transparency introduced here can be rendered more precise by distinguishing it from other modes of understanding. I will confine myself to two influential types of transparency discourse that are also relevant for understanding disenchantment. On the one hand, there is the ideal of pure subjective knowledge, as this was given paradigmatic expression by René Descartes and Jean-Jacques Rousseau, two authors whose ideas still shape large parts of the philosophical discourse.³⁴ The restriction of transparency to subjectivity limits the possibilities of understanding it in objective terms (4.1). On the other hand, the objectivity of transparency as such has also been disputed.

34 Two still influential monographs on the topic of transparency in Rousseau and Descartes respectively are: Jean Starobinski, *Jean-Jacques Rousseau, Transparency and Obstruction*, trans. Arthur Goldhammer (Chicago: University of Chicago Press, 1988) and Bernhard Williams, *Descartes: The Project of Pure Enquiry* (New York: Routledge, 2014).

Conceptions based on a critique of culture regard transparency as an expression of misguided scientific ideas allied with dangerous social developments (4.2).

4.1 Transparency as subjective knowledge

Without using the term “transparency” in the sense of the idea of a world that is transparent for human beings, Descartes’ epistemology contains some features that coincide with the concept of scientific-epistemic transparency. In Descartes, clarity and distinctness serve as criteria of truth that guarantee knowledge of the world. But nothing is as clear and distinct as one’s own thinking.³⁵ Since the claimed unsurpassable transparency and absolute immunity to error of one’s own thought can only be experienced introspectively by a single subject, it is only suitable in a qualified sense as a candidate for objectivity (as implied by the concept of transparency advocated here).

Descartes accords the explanations of empirical phenomena merely a hypothetical character. Assuming that the clear and distinct truth of thought provides the yardstick, the explanation of the world of experience achieves only a diminished level of transparency.³⁶ However, the hypothetical element of the scientific representation of reality does not necessarily have any enduring validity. There are reasons to believe that Descartes assumed that the hypotheses for explaining the external world could be replaced by true, intersubjectively verifiable and hence objective statements as research progressed.³⁷

35 René Descartes, *Meditations on First Philosophy: With Selections From the Objections and Replies*, ed. John Cottingham (Cambridge: Cambridge University Press, 1996), 16 ff.

36 The epitome of non-transparency is the obviously existing interaction between thinking and the extended world. As Margaret Dauler Wilson correctly points out, Descartes’ explanations of these relationships between body and soul are replaced by the “rather obscure and difficult to interpret” expression “nature teaches me that” (“natura docet”) (Margaret Dauler Wilson, *Descartes* [London and Boston: Routledge & Kegan Paul, 1978], 209).

37 Gregor Schiemann, “Descartes’ Hypothesenbegriff im ‘Discours de

In contrast to Descartes (and Aristotle), Rousseau's contribution to the philosophy of science resides in critique rather than justification. He criticizes the claim to truth and the general validity of scientific knowledge. The sciences owe their emergence to human vices, according to Rousseau; with their findings they also conceal truths and they represent a social danger.³⁸

Like Descartes, Rousseau is committed to the ideal of a purely subjective knowledge that satisfies the requirements of universally accessible objectivity only in a limited sense. But, in contrast to Descartes, he does not regard his own rationally constituted thinking, but instead the "inner voice of nature," which expresses itself in everyday practice as individual conscience, as the epitome of truth.³⁹ Inner nature has not been destroyed in the course of the process of civilization, but its effectiveness has been changed by human action. The conscience that is inherent in every human being contains the residua of a nature that has not been deformed by culture. With this Rousseau affirms a power of judgment that is independent of scientific knowledge and is able to make contributions on the topic of nature in public space. In this context, "transparency" becomes the guiding principle for an orientation to the fiction of an as yet unobstructed access to the world.⁴⁰

This meaning of epistemic and public transparency as immediate intelligibility is not part of the concept defended here insofar as it is restricted to the scientific knowledge of the world. The theoretically mediated character of the explanations and processes of understanding typical of this knowledge contradicts the Rousseauian concept. However, Rousseau rightly points to the spaces of experience that are still founded on the naturalness of human life. I understand the lifeworld, which in its structure of perception and action takes up elements of the immediacy described by Rous-

la methode' und in den 'Principia philosophiae', in *XVII. Deutscher Kongreß für Philosophie Leipzig 23.–27. September 1996, Kongreßband: Vorträge und Kolloquien*, eds. Christoph Hubig and Hans Poser (Leipzig: Institut für Philosophie, 1996).

38 Jean-Jacques Rousseau, *The Social Contract and The Discourses*, trans. George Douglas Howard Cole (New York: Sovereign, 2016), 83.

39 Rousseau, *Contract*, 87.

40 Starobinski, *Rousseau*.

seau, as one type of this experience.

4.2 Transparency as an object of cultural criticism

I understand “cultural criticism” in a broad sense. Its object is the critical assessment of cultural phenomena, where—following its predominantly pejorative meaning in actual usage—I limit myself to the disapproval of transparency as a cultural phenomenon in philosophical discourse.⁴¹ In this discourse, the term transparency is used to refer to both epistemic and public forms, without a sharp distinction being made between these applications. In substance, the selected authors thematize the phenomenon of transparency they criticize as part of a process of disenchantment, albeit without reference to Weber. The concept of transparency proposed here is distinguished from cultural criticism by its descriptive character, which coheres with Weber’s universalist understanding of disenchantment.⁴² Although Weber takes a negative view of the cultural nihilism concerning the meaning of disenchantment, he describes it as a factual process that is beyond human control.

Manfred Schneider considers modernity’s “dream of transparency” to be an omnipresent, but unrealizable and therefore all the more dangerous project that was formulated in programmatic terms by Descartes and Rousseau.⁴³ Schneider defines transparency so narrowly that it is in fact impossible to realize. Following Descartes and Rousseau, he defines it as knowledge that has immediate and unquestionable access to its object.⁴⁴ But scientific knowledge, to which my concept of scientific-epistemic transpar-

41 The concept of culture refers to identity-forming and unifying achievements of localized communities, where the achievements in question transcend the natural conditions of life of these communities by forming traditions.

42 See footnote 10.

43 Manfred Schneider, *Transparenztraum: Literatur, Politik, Medien und das Unmögliche* (Berlin: Matthes & Seitz, 2013).

44 Schneider, *Transparenztraum*, 11–16.

ency refers, is not based on self-evidence, but on experience, which is for the most part acquired by technical means, and on the theoretical reconstruction and prediction of data.

For *Byung-Chul Han*, the discursive dominance of the catchword “transparency” demonstrates that “the moral foundation of society has become brittle.”⁴⁵ The “transparency society” does not rely on trust, but on control. The crazy attempt to implement the idea of transparency completely (whose exemplary expression he finds in Rousseau) leads, according to Han, “necessarily ... to tyranny,”⁴⁶ since a human life without areas of obscurity is not possible. Han polemically highlights how transparency destroys meaning. Only machines and emptiness, he argues, are completely transparent.⁴⁷ In keeping with the theme of social criticism, he is primarily concerned with public transparency, which, in contrast to epistemic transparency, actually requires social limitation, as I will explain below. As an antidote to the threat of the dominance of transparency, Han recommends Nietzschean “pathos of distance.”⁴⁸

Both Jean Baudrillard and Gianni Vattimo discuss the epistemic and public aspects of transparency but, for opposite reasons, do not accord central importance to resistance to the social influence of transparency. For *Baudrillard*, the complete transparency of all conditions and processes is the characteristic expression of the supremacy of nihilism, which he attributes to the advanced scientific representation and technical controllability of the world. After disenchantment had destroyed the world of appearances in the nineteenth century, he argues, meaning was annihilated by the transparency that leads to “indifference and lack of conviction.”⁴⁹

45 Byung-Chul Han, *The Transparency Society*, trans. Erik Butler (Stanford, CA: Stanford University Press, 2015), 48 (translation amended).

46 Han, *Transparency Society*, 44.

47 Han, *Transparency Society*, 3 and 40.

48 Han, *Transparency Society*, 4.

49 Jean Baudrillard, “Transparenz,” in *Probleme des Nihilismus: Dokumente der Triester Konferenz 1980* (Berliner Hefte 17), eds. Volker Braunbehrens et al. (Berlin: Verlag Kantstraße, 1981), 30 ff. On the nihilistic character of transparency in Baudrillard, see Gregor Schiemann, “Nihilismus der Transparenz:

Although Baudrillard's description of the transparent society at times reads like that of a hopeless catastrophe, his work also contains calls for resistance. Thus he pleads for a return to the phenomena: "I believe in the immortality of appearances and that they are immune to the nihilism of meaning and nonsense."⁵⁰

While Baudrillard's description of transparency is in part accurate but grossly exaggerates its importance, Vattimo underestimates transparency. Vattimo agrees with Baudrillard that transparency follows the model of scientific objectivity, but claims that the influence of this model is dwindling and that it is itself undergoing a crisis.⁵¹ The plurality of the real conditions and of the possible conceptions of reality, not just those geared to scientific objectivity, is rendering the world less transparent. According to Vattimo, the scientific knowledge that aims at transparency is not able to grasp the world in its diversity. Opacity is not only a hallmark of reality and the ways of understanding it, but corresponds to human needs.

The negative evaluations of transparency in the critique of culture remind us that scientific objectivity, which claims that its subject matter are phenomena that transcend cultures and epochs, is also a culturally dependent and historical phenomenon that is subject to change and can be made to disappear. However, the striving for transparency that reaches as far back as antiquity has established and proven itself as a distinguishing feature of scientific objectivity, so that there are reasons to assume that this connection will remain in place for the time being.

5. Limits of scientific-epistemic transparency and of nihilism concerning meaning

In scientism, epistemic transparency follows the idea that Grenzen der Medienphilosophie Jean Baudrillards," in *Paradoxalität des Medien*, eds. Jan-Henrik Möller, Jörg Sternagel and Lenore Hipper (Paderborn: Wilhelm Fink, 2013).

50 Baudrillard, "Transparenz," 37.

51 Gianni Vattimo, *The Transparent Society*, trans. David Webb (Baltimore: Johns Hopkins University Press, 1992), 8.

all phenomena in the world can be grasped by science. It assumes that there are no methodological limits to science, only those set by its perhaps finite set of objects. For the present, we can only speculate about possible limits to transparency. The observable universe is spatially limited; moreover, its accelerated expansion will in the distant future limit the scope of the objects that can be experienced.⁵² It will probably continue to be possible to study the domain of the very small on earth only if we succeed in making particles collide with much higher energies than those employed up to now. But it may not be practically feasible to produce the required energies. Furthermore, we cannot rule out that causal connections, which are indispensable for several explanations, will run up against a limit in irreducibly chance occurrences, such as are already asserted today for the world of the very small. From a causal perspective, chance necessarily remains opaque.

Today scientific explanation and understanding are always restricted insofar as they are conducted with reference to specific fields or layers of reality.⁵³ Thus, for example, we distinguish between physical, chemical and biological explanations, each of which draws upon specific concepts and rules. The difference between explaining objects of the material world and understanding objects with meanings can also be understood as a product of the differentiation and autonomization of scientific knowledge. Contemporary scientific knowledge is fragmented and often does not even allow experts from neighboring disciplines to communicate with each other about their research.

Under these conditions, lack of transparency arises where phenomena simultaneously fall within the object domain of different concepts and rules. Examples of this are transitional phenomena between atomic and chemical, chemical and biological, and

52 Gregor Schiemann, "The Coming Emptiness: On the Meaning of the Emptiness of the Universe in Natural Philosophy," *Philosophies* 4.1 (March 2019), <https://doi.org/10.3390/philosophies4010001>.

53 On the conception of world as comprising levels of reality, see Gregor Schiemann, "Levels of the World: Limits and Extensions of Nicolai Hartmann's and Werner Heisenberg's Conceptions of Levels," *Horizon: Studies in Phenomenology*, 8.1 (2019): 103-122.

biological and mental objects. In other words, it is not yet possible to represent the relationships between the concepts and rules of the object domains of physics, chemistry, biology and psychology in a transparent way. Even more problematic is the relationship between scientific explanation and understanding. Can phenomena of meaning be explained by material processes? Can the explanation of material processes dispense with the understanding of meaning?

In the past, progress in explanation and understanding was not only achieved through differentiation, but conversely also by merging areas of knowledge. In physics, different effects of forces were represented by unified laws, chemical processes were explained in physical terms, and so forth. Furthermore, certain variants of scientism strive to unify all scientific knowledge by explaining all phenomena as objects of a single comprehensive theory. If this were successful, it might not just involve the elimination of ambiguities between different concepts and laws. In their unified description, scientific knowledge, assuming that it was generally intelligible, and the production of cultural meaning might once again come closer together. To the extent that the separation between objectivity and subjectivity or between facts and norms would be overcome, science might develop norm-setting and hence meaning-endowing dimensions. In that case, which is admittedly quite unlikely, the nihilism of transparent knowledge would at least be relativized, if not completely obviated.

6. Limits of public transparency

Transparency is a ubiquitous catchword, less so because of its epistemic importance for science than because of its relevance in public debates. Whereas in the foregoing discussion public transparency served primarily to better define epistemic transparency, here I would like to contrast the non-self-limiting character of epistemic transparency with the need to set limits to public transparency. Where scientific knowledge acquires public relevance, it is

also exposed to the demands for public transparency.

With regard to the requirement that information should be generally available and the need to place limits on it, a rough distinction must be made between two kinds of cases. On the one hand, the requirement is addressed to social institutions and actors to disclose the relevant information underlying their procedures, decisions and actions. In order to facilitate public judgments, political, economic and legal processes should be rendered intelligible in this sense. Fulfilling this requirement is not always unproblematic, since determining the criteria of relevance is often beset with ambiguity, the disclosure of information can hinder the organization of social processes and it can also be politically, legally or morally questionable. Therefore, procedures are required to set limiting regulations.

On the other hand, social institutions also call conversely for the creation of transparency in public and private space. For example, public spaces are monitored or people's private data are recorded for security purposes. Since control over not generally accessible information is constitutive of the private sphere, this transparency requirement is also not uncontroversial. It calls for a complex counterbalancing of the social good of security against the individual good of privacy. In order to protect the private domain, limits must be placed on public transparency.

Every restriction of public transparency—be it in order to protect social institutions and their actors or to protect the private sphere—is also a restriction of the disenchantment generated by scientific-epistemic transparency. What is not generally accessible is also not accessible to the scientific comprehension of the world and, as long as human beings have control over it, it is not generally transparent.

7. Conclusion

A world that had been completely explained and understood would be epistemically transparent. All obscurity with re-

gard to phenomena would have been eliminated in this world and scientific knowledge would be no longer be subject to any hindrances or limits. From all that we know today, such a world will probably never exist. But the scope and transparency of knowledge are increasing over time and in future they could achieve such a degree of completion that there would be no room for significant improvement.

In the modern world, transparency is primarily created by scientific knowledge on a global scale. Not only is it not essentially dependent on cultural meaning, but until now it has also eliminated existing cultural meanings without replacing them with alternatives. Cultural meaning contains comprehensive systems of relevance and practical orientations such as were traditionally offered by religions. The inability of science to create comprehensive meaning is currently a function of its differentiated and autonomous character.

The transparency generated by science stands in the tradition of disenchantment (*Entzauberung*) as described by Max Weber. Weber uses the term “enchantment” or “magic” (*Zauber*) in its narrow sense to refer to the recognition of not rationally demonstrated claims and non-sensually experienceable realities that nevertheless have relevance for action. However, the successful historical reception of the concept of disenchantment can be traced back to the broad meaning of “enchantment” or “magic.” Disenchantment then means that the phenomenal world loses its fascination and unquestionable relevance for human beings.

In modernity, disenchantment increasingly assumes the form of the creation of scientific-epistemic transparency. The world that science recognizes, and which is in this respect transparent for it, is not only one devoid of comprehensive meaning, but also one whose details have lost their enigmatic character and their mysterious radiance (section 1). If science were to succeed in overcoming the specialized character of its knowledge and subsuming it into a uniform and generally comprehensible system, it could develop a meaning-generating force within its limited scope, although this can hardly be expected (section 5).

In order to understand scientific-epistemic transparency as advanced disenchantment, some conceptual work needs to be done and this is a task for philosophy. On the one hand, Weber's concept of disenchantment is in need of correction. It must be conceived more narrowly through a more precise reference to the sciences, which means that it must be demarcated from non-scientific forms of transparency, such as are primarily found in the lifeworld (section 2). At the same time, however, it must also be expanded by incorporating the value-laden character of scientific knowledge rejected by Weber (section 3). On the other hand, the concept of scientific-epistemic transparency must be clearly distinguished from other conceptions of transparency. Scientific-epistemic transparency must not be conceived as essentially a result of subjective cognitive processes and its objectivity must not be disputed (section 4). Finally, epistemic transparency must be contrasted with the public transparency that is at the forefront of the current discourse (section 6).

The process of disenchantment has already reached an advanced stage due to the dominance of its transparent form. An excellent way of characterizing this condition is through Weber's observation that the extent of the scientific knowledge achieved so far justifies the general assumption that in principle nothing experienceable can elude it. Even if the world is still far from having reached the presumed limits of its transparency, hardly anyone in science doubts that we could make it transparent to a large extent "if we wished to" (Weber). The taken-for-grantedness with which the possible transparency of the world is already assumed and accepted is, however, itself a feature of transparency.