Chapter 1

Introduction

Contesting the Authority of Science

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1

Introduction

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> An institution under attack must reexamine its foundations, restate its objectives, seek out its rationale. Crisis invites self-appraisal (Merton, 1973a [1942]: 267)

1. Marching for Science

On April 22, 2017, tens of thousands of people, scientists and concerned citizens alike, marched for science. In the pouring rain, media personality and science popularizer Bill Nye ('the Science Guy') addressed the crowd in Washington, DC: "We are marching today to remind people everywhere, our lawmakers especially, of the significance of science for our health and prosperity." In the shadow of the National Monument, close to the White House, he warned against political elites "deliberately ignoring and actively suppressing science." A participant interviewed by CNN pointed out the sea change in just half a century: "John F. Kennedy promised this nation that by the end of the sixties we'd land on the moon. Now almost fifty years later we have an American president disparaging the facts, denigrating science. And we are here to tell him that science matters."

The first March for Science in 2017 not only mobilized protest in a wide range of American and Canadian cities, but also in Australia (e.g., Canberra, Melbourne, Sydney) and all over Europe (e.g., Berlin, Stockholm, London, Brussels, Amsterdam, Budapest, Warsaw, Belgrade, Bucharest). The protests did not remain confined to the West either, as testified by marches in Asia (e.g., Ho Chi Minh City, Taipei, Hong Kong, Hyderabad, Dhaka, Seoul, Quezon), Africa (e.g., Accra, Abuja, Kampala), South America (e.g., Rio de Janeiro, Bogotá, Santiago, Buenos Aires), and even Antarctica. Doubtlessly encouraged by

the circumstance that the primary initiative was American and that the event took place on April 22, Earth Day, many participants all over the world marched in opposition to Donald Trump, who no longer prioritizes funds for scientific research ('Make America smart again'; 'Trust scientific facts, not alternative facts'; 'You can't grab science by the pussy!'; 'Next NASA mission: launch Trump to Uranus'), who relies on notions like 'alternative facts', and who considers climate change a mere hoax by the Chinese government ('Mother nature trumps alternative facts'; 'Ice has no agenda, it just melts'; 'We've lost our patience: the oceans are rising and so are we'; 'Climate change is real'; 'There is no planet B').

Disgust of Trumpean anti-intellectualism and concerns about climate change nonetheless merely epitomize the more general issue at stake, as revealed by many other banners and placards that insist that politics should take science seriously because of its promise of overcoming problems threatening humanity: 'Got polio? Me neither. Thanks, science!'; 'Science saves lives'; 'Science is magic that works'; 'Science: It works, bitches'; 'Society should worry when geeks have to demonstrate'; 'Physics makes the world go round.' Even granting the occasional placard voicing support for the humanities ('Humanities: Enlightening the world since the 4th century'), it is striking to note the preoccupation with natural science, its technological accomplishments and its further promises.

Indeed, the Marches for Science take place against the background of concerns within the 'harder' fields of science about an alleged postmodern 'anything-goes mentality' in the humanities and social sciences. Those concerned regard postmodernism a threat to neutral, empirically grounded knowledge, leading science to fall prey to unworldly leftist cultural identity politics, especially in the humanities and social sciences (e.g., Gross and Levitt, 1997). Responses to today's contestations of the authority of science as such tend to be framed in the moral terms of good and evil: trusting science and its truth claims is consistently construed as good, while its counterpart is routinely condemned as morally wrong and socially detrimental. This moralizing tendency is underscored by tendencies to push the issue at stake into the political binaries of 'right' versus 'left', 'authoritarian' versus 'democratic', i.e., to link contestations of the authority of science firmly to the Trump presidency.

This book seeks to bypass such moralizing tendencies by approaching the issue from a cultural-sociological perspective. Our aim is hence neither to morally condemn nor to praise the headwind faced by contemporary science, but rather to dig into the

explanatory mechanisms that account for the current situation. We do so not only because self-justifying political responses easily backfire, but also because such indignant responses conceal many an inconvenient fact. Indeed, cultural and intellectual history provide abundant evidence that contestations of the authority of science are not necessarily authoritarian and politically rightist. Earlier left-libertarian critics have also massively contested the authority of science, pointing out how the latter's mindless acceptance poses a threat to liberty and democracy.

In this introductory chapter we trace the latter argument in both intellectual discourse and cultural history to argue that contestations of the authority of science entail a rejection of scientism. This is an understanding of science as a sort of secular religion that conceives of science as 'superior' to alternative ways of relating to the world, because the 'facts' it produces do 'neutrally' and 'objectively' represent 'the world as it really is'. Highlighting the oft-neglected similarities between religion and scientism, we then introduce three theories from sociology of religion and explain why they offer fruitful points of departure for understanding contestations of the authority of science. This is why these theories inform the empirical contributions in the remainder of this book.

2. Scientism: Science as Secular Religion

2.1. Modern Science and Its Critics

Modern science emerged in the period from the fifteenth through the seventeenth centuries, coinciding with major scientific breakthroughs associated with the work of natural scientists like Copernicus, Kepler, Galileo, and Newton (Dijksterhuis, 1961; Toulmin, 1990: 5-44). It understood scientific truth as resulting from the combination of logical reasoning and systematic empirical observation. This point of view was popularized in the eighteenth century by Enlightenment thinkers like Voltaire, Condorcet, Hume, and Montesquieu. They paved the way for nineteenth-century pioneers of social science like Comte, Marx, Spencer, and Freud, who connected the quest for scientific knowledge about the foundations of human society with reformist political agendas. In that era the modern scientific worldview was in effect transformed into a major cultural and political force as part of "a struggle by new social and cultural elites to undermine aspects of the religious

culture that underpinned the institutions of the church, monarchy, and the ruling aristocratic elite" (Seidman, 1994: 10).

Central to eighteenth- and nineteenth-century Enlightenment thought was indeed a systematic critique of religion, tradition, and belief as sources of ignorance and tutelage, with science conceived as their superior successor, promising material and moral progress (Seidman, 1994: 20-26). In this Enlightenment understanding, scientific knowledge differs drastically from other types of knowledge and meaning in that it does not stem from the human imagination, but from the careful and systematic study of the world itself. This notion became one of the mainstays of the modern self-image, which embraced science, rationality and technology as superior modes of relating to the world that would increasingly marginalize tradition, religion and belief.

This modern self-understanding came to be viewed with skepticism from the end of the eighteenth century onwards – not only inspired by Christian worldviews, as Enlightenment critiques of religion would lead one to expect, but equally so by Romanticism. Against the imperatives of science and reason, Rousseau, Coleridge and many others defended the significance of feelings, experiences and emotions, while applauding the human capacity of imagining non-existing worlds against the mere systematic empirical study of existing ones. These Romantic critiques differ sharply from Christian ones in that they reject what Enlightenment science and the Abrahamic revelation religions (Judaism, Christianity, and Islam) do despite everything have in common, i.e., "belief in the existence of a unique truth, instead of an endless plurality of meaning-systems" (Gellner, 1992: 84). Romanticism as such dismisses an understanding of truth as rooted in either divine revelation, which makes it a matter of religious belief, or in logical reasoning and empirical observation, which makes it a matter of scientific reason. Rejecting the authorities of science and religion alike, it rather underscores the liberty and capacity of human beings to indulge in utopian fantasies about imaginary worlds and to experience reality in a strictly personal fashion.

2.2. Max Weber about Science and Its 'Objectivity'

In this climate of clashes between Romanticism and the scientific worldview, Max Weber crafted his *Wissenschaftslehre*, which later generations of sociologists have tried to tame and domesticate by foregrounding just one of its elements, i.e., the normative doctrine of 'value freedom' or 'value neutrality' ('science can only tell how the world is, so

researchers ought to refrain from making claims about how it ought to be'). This one-sided reception obscures how this doctrine is intimately bound up with a more fundamental account of science and its 'objectivity' that challenges scientist understandings of science. For just like the world religions and their theological doctrines, Weber brings forth, science and its truth claims are irretrievably culturally embedded, so that the notion of science as religion's superior successor is flawed.

Weber firstly acknowledges that "the belief in the value of scientific truth is the product of certain cultures and is not a product of man's original nature" (2014 [1904]: 137), so that by implication scientific truth is not that which is universally valid and as such binding to everyone, but rather "that which *claims* validity for all who *seek* truth" (idem: 121, emphases in original). The quest for scientific truth is hence just one particular way of relating to the world and there is no logical way in which it can be made superior to for instance religion, morality, or aesthetics. Critiquing scientist understandings of science as religion's superior successor, Weber distinguishes sharply between scientific reason on the one hand and values and morality on the other, confining the former to matters of fact and logic, i.e., to debates about how the world actually is. This leaves religious and political worldviews as the only available resource to endow the world with meaning – to answer human questions of meaning and purpose, to tell what is good from what is bad, what needs to be done and what needs to be avoided.

Rather than asserting the superiority of science, Weber thus aims to "adjudicate the tensions between two vital Western traditions: between reason and faith, between knowledge and feeling, between classicism and romanticism, between the head and the heart" (Gouldner, 1962: 212-3), "attempting to guard the autonomy of both spheres" (idem: 211). He acknowledges their incompatibility without ordering them in terms of superiority and inferiority (see also Koshul, 2005) and in doing so he robs science of its status of be-all and end-all, as in Comtean-style scientism. The result is an account of science that is more critical of claims about the latter's authority than it is about the value and significance of religion. Indeed, as Gouldner observes (idem: 211, see also 1973), "(Weber's) main campaign here is waged against science and reason and is aimed at confining their influence. To Weber, even reason must submit when conscience declares, Here I stand; I can do no other."

In tandem with this relativist account of the status of science Weber addresses the role of culture and values in the conduct of scientific research. His principal point here is not that values need to be ousted from science, but rather the opposite: that scientific

research inevitably addresses 'issues that matter' and that 'what matters' is inevitably informed by values and as such a normative moral issue. In this Weberian understanding scientific research cannot and should not collect 'the' facts. It cannot do so, because 'the' facts do not exist: due to the endless complexity of reality 'the' facts always and inevitably entail an intellectually arbitrary selection from a much broader set of potential facts. It should not do so, because "Any knowledge of infinite reality acquired by the finite human mind is (…) based on the tacit assumption that, in any given instance, only a finite *part* of [that reality] should be the object of scientific comprehension – should be 'important' (in the sense of 'worth knowing about')" (Weber, 2012: 114). This is what Weber calls the 'value relatedness' (*Wertbeziehung*) of scientific research.

In Weber's hands the conduct of scientific research thus comes to resemble value-informed social action by non-scientists, even though after having normatively defined what is 'worth knowing' methodological craftsmanship and conformity to standards of intellectual integrity take over. This role of values in directing empirical research implies that research findings are always partial and one-sided. Even though the researcher herself surely finds the registered facts 'meaningful' and 'relevant', they are logically speaking only so for those who share her value priorities. For all others they are less culturally significant than a series of potential alternative facts that the researcher has decided to bypass. This means that accusations of research being 'one-sided' are intellectually meaningless, because research is always and inevitably one-sided: "The belief that scientific work, as it progresses, should assume the task of overcoming (…) 'one-sidedness' (…) is flawed" (2014 [1904]: 111). Reproaches invoking 'one-sidedness' do as such merely assert a critic's own value priorities ('What about race / class / gender?'; 'Surely, you need to address the relationship with power, too'). These are normative issues of moral or political taste that can be neither dismissed nor justified on strictly intellectual grounds.

A simple example suffices to demonstrate that normative standpoints cannot be defended by invoking 'the' facts. It is for instance not too difficult to demonstrate in a methodologically sound fashion that condom use protects against HIV/AIDS, but it is quite another to invoke this 'fact' to defend the claim that condom use needs to be encouraged and unprotected sex discouraged. For the study's value-informed definition of sex as a health risk is clearly one-sided. An equally one-sided study that instead construes sex as a source of pleasure will arguably produce a different 'fact', i.e., that both men and women find sex without condoms more enjoyable than protected sex. While the former study

manoeuvers reasons to abstain from condom use out of sight, the latter does the same with reasons to protect oneself. Clearly, then, none of these studies can be used to defend 'policy implications' on strictly logical and empirical grounds. This is all the more so, because there are of course many additional reasons for using contraceptives or not. Men may for instance define condom use as 'un-manly' and deny women's right to go against their male wishes and desires, perhaps especially so in non-western settings.

In Weber's understanding, in short, it is inevitable that data are collected and facts arrived at on the basis of intellectually arbitrary values, so that facts do not have logically compelling implications for policies. So while science can surely produce facts, the latter can only inform policies after they have been interpreted as either 'good' or 'bad'; a 'pleasure' or a 'nuisance'; a 'healthy' condition or an 'unhealthy' one; a 'social problem' to be wiped out or a 'blessing' to be cherished. This is the underlying rationale of Weber's normative doctrine of value neutrality: empirically established facts have no 'intrinsic' meaning, so there is no such thing as a 'neutral', 'scientific' or 'logical' path from facts to moral evaluations and policy measures.

Critics of scientism have time and again invoked similar arguments since Weber's days, albeit more often than not without observing the marked continuity with the Weberian account of science. Science, these critics have observed like Weber before them, is not logically superior to alternative ways of relating to the world and research does not simply represent the world as it 'really' is, i.e., in a strictly 'neutral', 'objective' and culturally unmediated fashion.

2.3. The Counter Culture of the 1960s and the Postmodern Turn

Indeed, these notions were among the mainstays of the so-called 'counter culture' of the 1960s and 1970s, which critiqued not only religion and tradition, but also reason and science for standing in the way of personal liberty and dreams of a better world. Budding young academics and students with middle-class backgrounds and leftist-liberal political profiles back then accused science of being basically conservative politics in disguise. They critiqued science as the handmaiden of 'technocracy' or 'the system', both understood as forcing people into slave-like existences as futile cogs in the rationalized modern machine (see Marwick, 1998; Roszak, 1969; Musgrove, 1974; Zijderveld, 1970).

The young critics found much of their intellectual ammunition in the works of the philosophers and sociologists of the Frankfurt School. Adding sizable doses of Weber and

Freud to Marxism, and no longer seeing the cultural sphere as a mere superstructure that reflects an economic infrastructure based on class power, authors like Fromm (1941), Horkheimer and Adorno (2002 [1944]) and Marcuse (1964) exchanged faith in an inevitable socialist revolution for the necessity of liberation from ideological indoctrination. This entailed a profound transformation of the old-school Marxism that claimed an objective scientific status for itself. Whereas the latter 'scientific Marxism' charged its bourgeois critics with betraying ideals of objectivity and impartiality and with legitimizing the existing order and reigning interests, the Frankfurters rejected "the cult of objective fact as such, and not merely its alleged misapplications" (Gellner, 1992: 33).

Thus, in *Dialectic of Enlightenment* (2002 [1944]), indeed a telling title, Horkheimer and Adorno argue that reason had changed from an emancipatory force into an oppressive one because it had gradually been reduced to pure instrumentality and calculability. This had gone hand in hand with the scientific reduction of 'the world' to a mere ensemble of facts, studied by a positivism that equates reality with 'that what is' and as such excludes the dimension of possibility or 'that what could be'. Marcuse (1964) unfolds a similar argument in *One-Dimensional Man*, also critiquing the limitation of science, reason and truth to 'that what is' and underscoring the importance of a thinking that dares to speculate and open up new, emancipatory vistas. With this emphasis on the necessity of conceiving attainable utopias that counter the weight of seemingly neutral descriptions of existing reality, the Frankfurters targeted empirical science's 'fact fetishism' and gave a social twist to Romanticism's belief in the blessings of the faculty of imagination.

In line with the foregoing the Frankfurters underscored that people in the West do not at all live free and happy lives in tolerant and democratic societies, but are merely made to believe they do. Hence Marcuse's (1964) argument that consciousness-raising and freeing one's mind are both the conditions and the goals of genuine political action. Horkheimer and Adorno (2002 [1944]) similarly critiqued the 'culture industries' for keeping people in a shiftless, complacent and uncritical state of half sleep that veils harsh realities and seduces them into mistaking their alienation for a state of satisfaction and happiness. These are indeed Romantic notions that differ profoundly from old-school Marxism (Campbell, 2007: 294-295; Josephson-Storm, 2017: 209-39), even though other Frankfurters had doubts about whether such a 'mind-switch' was effectively possible within the confines of existing society. Yet, these ideas sounded like music in the young protesters' ears, witness countercultural slogans like "Power to the imagination!" and "If

the theory doesn't fit the facts, then that's too bad for the facts!" Slogans like this still sound familiar today, even though they now tend to come from the Trumpean right (Duncombe, 2007).

The period from the 1980s onwards then witnessed a cross-fertilization of the heritage of the Frankfurt School with newly emerged French post-structuralism (Derrida, Foucault, Lacan, Deleuze, Baudrillard, etcetera). This produced the so-called postmodern turn in the humanities and social sciences, meanwhile firmly institutionalized in the new transdisciplinary field of cultural studies (Inglis, 2007). This postmodernism rejects the epistemic privilege of science. It underscores that there is no way to 'neutrally' or 'objectively' decide on the validity of competing knowledge claims, because the latter are inextricably bound up with incommensurable cultural frames. Much like Weber much earlier, then, postmodernism denies the possibility of a 'neutral' or 'objective' representation of reality and understands cultural pluralism as an inescapable condition that cannot be solved by science. The postmodern worldview entails "the dissipation of objectivity," as Bauman (1992: 35) puts it: "The element most conspicuously absent is a reference to the supracommunal, 'extraterritorial' grounds of truth and meaning" (see also Aronowitz, 1992: 258). Culture is here hence regarded as consisting of heterogeneous 'language games' (Lyotard, 1984) or incommensurable 'vocabularies' (Rorty, 1979, 1989) that compete and clash with each other without the possibility of a fair and neutral settlement. "Once the veil of epistemic privilege is torn away (…), science appears as a social force enmeshed in particular cultural and power struggles. The claim to truth, as Foucault has proposed, is inextricably an act of power – a will to form humanity," as Seidman (1991: 134-135) summarizes the postmodern position.

Postmodernism moreover conceives itself as a 'philosophy of difference' that positively appreciates the postmodern condition of radical and irresolvable cultural pluralism. It defends the latter against totalizing claims informed by 'meta-narratives' that articulate science's presumed epistemological exceptionality in terms of societal progress (through technology) or individual emancipation (through Enlightenment) (Lyotard, 1984). This defense of cultural pluralism and difference informs the political engagements of 'the academic left', to borrow a phrase from its critics (e.g., Gross and Levitt, 1994), i.e., an engagement with the left-libertarian identity politics of social movements like the women's and gay and lesbian movements. This engagement has helped postmodernism travel beyond the academy and has as such facilitated the emergence of what one might call an 'everyday postmodernism'.

Such everyday postmodernism nowadays even informs populist rightist-authoritarian identity politics. For despite, or rather precisely because of, its marked nationalism and dreams of cultural sameness, the latter also embraces radical notions of insurmountable cultural difference and likewise rejects the authority of science. In doing so it much like its left-libertarian counterpart privileges non-existing imagined worlds and everyday experience over the rational scientific analysis of the sorry, alienating and miserable state of actually existing society (Canovan, 1999). Informed by everyday experience, it celebrates the practical knowledge and understandings of 'the common people' (Taggart, 2000: 95-98), as epitomized by figures like 'Joe the plumber' (USA) or 'Henk and Ingrid' (the Netherlands). 'What every person with just a modicum of common sense knows' is here deemed superior and more practically sound than the rationalist, science -informed understandings of the world held by intellectual and political elites.

What is nowadays critiqued and rejected as populist rightist-authoritarian 'post-truth politics' by those identifying with the political left, in short, has much in common with its left-libertarian counterpart, with the left-libertarian counter culture of the 1960s and 1970s, and with the Romantic movement from the late-eighteenth century onwards. Despite the political-cultural shift to the right, the basic complaint has moreover remained much the same: that it is intellectually misguided and morally wrong to conceive of science as a privileged source of knowledge, i.e., as superior to non-rational and non-scientific ways of understanding the world. The more the postmodern temper disseminates, both within the academy and beyond it in politics and everyday life, the more distinctions between knowledge and belief; between trained scientific experts and ordinary citizens; between empirically grounded accounts and wishful thinking; and ultimately between fact and fiction, become blurred and obscured. The booming market for psychological and spiritual self-help books, often of debatable scientific repute, exemplifies today's openness to and tolerance of 'alternative' ideas (e.g., Furedi, 2003). In the process, such alternative and deviant ideas become less and less likely to be taken down and discredited as 'unscientific', 'delusional', or 'irrational' – except by rationalist academic diehards.

2.4. Sociology of Science and Sociology of Religion: Convergences

Critiques of science as be-all and end-all have since the 1970s transformed the sociology of science. The latter traditionally limited itself to the social conditions that facilitate or impede the conduct of modern science (e.g., Merton, 1973b), shying away from a

sociological explanation of scientific practices themselves. Under the labels 'Sociology of Scientific Knowledge' (SSK) and 'Science and Technology Studies (STS)' sociology of science has since the 1970s begun to address precisely such practices, not least the acceptance or rejection of truth claims as either 'true' or 'false' by scientists themselves. This entails a marked shift away from sociologically unsatisfactory distinctions between scientists and non-scientists, as if only the latter are influenced by social and cultural forces and hence in need of sociological analysis. The sociology of science has thus come to dismiss the notion that the production of scientific truth merely entails following impersonal and neutral methodological rules, without extra-scientific social and cultural influences playing any role in the process (Barnes, 1974; Bloor, 1976; Callon et al., 1986; Latour, 1987).

This new sociology of science has meanwhile done much to unmask scientist understandings of 'objective' and 'neutral' science as a modern myth. 'Science in action', as Latour (1987) calls it, features a good deal more than the mere deployment of methods and technical instruments to register 'the facts'. It entails precisely the sort of extra-scientific social and cultural dynamics that scientism denies and that cannot be reconciled with its rhetoric of the strict objectivity and autonomy of science. While in presenting their research findings scientists typically pretend to have merely registered 'the facts', this obscures the role of all sorts of hoped-for and aimed-for findings in shaping their research. For the theories or models that have led them to their findings are inevitably shaped by all sorts of influences, not least work done by competing research groups, priorities of funding agencies, and needs and concerns of policymakers and politicians. Like other types of social action, then, 'science in action' entails a human and social activity that cannot be understood without reference to the wider societal and cultural environment.

Contemporary students in the sociology of science in effect no longer take the aggrandizing scientist portrait of science as producing 'absolute' or 'neutral' knowledge about 'reality as it really is' for granted. They have rather come to understand it as intimately connected to, and influenced by, all sorts of political, economic and cultural interests – a shift epitomized by the Foucauldian adage that 'knowledge is power'. The scientist notion that scientific knowledge can 'neutrally' guide humanity in solving whatever kind of problem has in the process been exposed as a genuine ideology. For in addressing opportunities for knowledge application, science bluntly oversteps the distinction between 'what is' and 'what ought to be', between scientific facts and moral values, notwithstanding its self-understanding as a neutral and objective, culturally

unmediated fact-finding practice. In the process scientific experts mediate between scientific knowledge on the one hand and values and interests on the other. They do as such not simply represent scientific knowledge, but calibrate the latter in function of various non-scientific parameters that define phenomena as problems in need of solution, informed by stake-holders ranging from government agencies to social movements (e.g., Beck, 1992).

The scientist pretension of being able to objectively grasp the 'real' truth about reality – 'reality as it really is', so to say – exposes an oft-neglected similarity between scientism and religion, especially religion in the more orthodox strains of western-style Abrahamic revelation religions like Judaism, Christianity, and Islam. This is because scientism and this type of religion alike assume the existence of a culturally unmediated truth, unpolluted by human understandings and prejudices: 'real' truth about reality as it 'really' is, that is as such taken to be universally binding. Both do as such understand what people *believe* to be true as potentially misguided and standing in the way of 'real' truth. In both cases this invokes an urge to authoritatively assess the validity of lay beliefs: their scientific legitimacy in the case of scientism (i.e., their '(ir)rationality', their truth or falsity according to scientific standards) and their sinfulness or moral rightness in the case of orthodox religion (i.e., whether or not they are in keeping with God-revealed truth).

This does of course not mean that science and religion are identical, for they are obviously not – neither in terms of ontology (a supernatural reality is not the same as an empirically observable reality), nor in terms of epistemology (belief is not the same as reason). Nonetheless, despite these differences, they both assume the existence of a 'real', culturally unmediated and hence universally binding truth: "(T)he (…) cognitive ethic of the Enlightenment (…) shares with monotheistic exclusive scriptural religion the belief in the existence of a unique truth, instead of an endless plurality of meaning-systems; but it repudiates the idea that this unique vision is related to a privileged Source, and could even be definitive. (…) Only a procedure, but no substantive ideas, is absolutized" (Gellner, 1992: 84).

In the new sociology of science and in sociology of religion alike this oft-neglected similarity between scientism and religion informs strategies of preventing researchers from 'going native' by accepting and reproducing emic understandings of truth and falsity. Sociology of science boasts the so-called principle of 'symmetry', according to which a sociology worth its salt needs to explain the embracement of successful ('true') knowledge claims by scientists and unsuccessful ('untrue') ones by non-scientists by means of the

same interpretative vocabulary and explanatory principles (Barnes, 1974; Bloor, 1976), thus bracketing issues of ('real') truth. Because sociology of religion, like sociology of science and unlike theology, is not interested either in whether religious beliefs (e.g., about the existence or ontological qualities of God) are 'really' true or not, it adopts a similar strategy. All that sociologists of religion study is the 'human' side of religion, i.e., how people conceive of the sacred and how they give shape to their relationship with it. In doing so, sociology of religion embraces a 'methodological agnosticism', according to which metaphysical claims about the truth of religious doctrines need to be abstained from (e.g., Furseth and Repstad, 2006: 197-198; Wilson, 1982: 1-26).

Sociology of science's principle of symmetry and sociology of religion's methodological agnosticism do hence both bring forward that truth claims need to be studied without privileging some of them while discrediting others. Even if one doubts the intellectual merits of this strategy, it is important to realize that the only alternative comes down to accepting and reproducing particular 'native' or 'emic' understandings of truth, which can then only inform 'explanations' in terms of people's alleged misguidedness or thoughtfulness – or, more prosaically put: their 'stupidity' or 'smartness'. That sort of explanation is however more morally than empirically informed and does as such not help much in understanding why people so often hold deviant and unconventional beliefs in the first place. Yet, it is precisely such an understanding that sociologists of science and sociologists of religion – or, more generally, cultural sociologists – are after. Informed by sociology of religion and the new sociology of science, then, this book also adopts this cautious and agnostic stance vis-à-vis the validity of truth claims: we do not study what *is* true, but what people *take to be* true.

The often overlooked similarities between religion and scientism, and between sociology of religion and sociology of science, point out that there are no good grounds either to theoretically disconnect the study of the authority of science from that of the authority of religion. Indeed, three sociological theories about religion can be fruitfully applied to the endorsement or rejection of the authority of science and its truth claims. First, there is the theory of *secularization*, according to which the emergence of a pluralist situation with competing worldviews erodes the authority of religion. Second, there is the theory of *religious purification*, according to which the same pluralist situation directs religious energies away from religion's institutional bulwarks and foregrounds spiritual experience. Thirdly, there is what we here call the theory of *religion's cultural significance*, which constitutes the common theoretical backbone of the classical

sociologies of religion of Weber and Durkheim. We elaborate these three theories in what follows and explain how each of them informs one of the three parts of this book.

3. Secularization and the Authority of Religion and Science

3.1. Secularization and Pluralism

The secularization theory that became dominant in postwar sociology is not one single and unitary thing, but not a hopelessly unstructured mess either (Casanova, 1994; Dobbelaere, 1981, 2007; Tschannen, 1991; Wallis and Bruce, 1992). Its virtually uncontested backbone is a thesis of structural differentiation, according to which the modern constitution is defined by various institutional realms that follow their own particular cultural logics. Religion in effect no longer morally 'overarches' all of society as a sort of 'sacred canopy', as Peter Berger (1967) has famously put it. While medieval art was still basically religious art, and while religion and science were still inextricably intertwined during the Renaissance, for instance, institutional realms like art, science, politics, and the economy have meanwhile transformed into coexisting subsystems that each follow their own cultural logic (e.g., Wilson, 1982). According to this theory of secularization, religion has transformed into a realm in and off itself, representing one cultural logic besides others and like its competitors lacking any domain-transcending authority or privileged status. This situation entails a 'crisis of credibility' (Berger, 1967: 151) that erodes religion's former authority.

This influential account of the fate of religion under conditions of modernity raises the often overlooked question whether science, unlike religion, is capable of escaping the plausibility-corroding consequences of cultural pluralism. For much like religion, science of course also faces a range of competing moral, political and aesthetic logics which are logically speaking inferior to neither religion, nor science, but merely radically different from both of them. The question is indeed whether science may not be *more* vulnerable than religion to such a condition of pluralism. For precisely science's marked aversion to dogma and unassailable truth claims (Gellner, 1992: 84), i.e., its commitment to intellectual openness and tolerance of critique, debate and disagreement, impedes its opportunities of imposing its superiority over competing cultural logics, as Colin Campbell (2002 [1972]: 24) has observed at a remarkably early stage:

> The changeover from a dominant religious orthodoxy to a dominant scientific orthodoxy does not seem to correspond to any greater control of heterodox beliefs, for while the decline in power of organized ethical religion appears to have removed the most effective control over heretical religious beliefs, a growth in the prestige of science results in the absence of control of the beliefs of non-scientists and in an increase in quasi-scientific beliefs.

Explaining why cultural pluralization undermines the special status of religion as a privileged and overarching 'meta-logic', then, the secularization theory provides no compelling arguments why science, unlike religion, could escape a similar corrosion of its authority. This is precisely what is wrong with the notion that religious authority in the course of secularization gives way to authority of science, a notion enshrined in theories of modernization and the modern self-image alike. Indeed, the blunt fact that nowadays science, much like religion before it, finds its authority under siege provides evidence to the contrary. In short, the theory of secularization as cultural pluralization suggests that the authority of science, much like that of religion before it, is incapable of escaping the authority-corroding consequences of cultural pluralism.

3.2. Part I of the Book: Authority of Science in the Face of Cultural Pluralism

The first part of this book, 'Authority of Science in the Face of Cultural Pluralism', further addresses how pluralism erodes the authority of science. Dick Houtman (Chapter 2) studies how cultural pluralism has led to the dissolution of the notion of 'real' or 'objective' truth in sociology in the post-war period, focusing on the crisis of sociology that broke out in the 1960s. Whereas the Protestant Reformation robbed the world of 'objective' meaning in the sixteenth century, he maintains, sociologists have likewise come to reject the positivist notion that social life can have such a thing as a 'discoverable', 'objective' meaning. Disenchantment in the classical sense of Max Weber, then, has meanwhile transformed the intellectual realm as much as the religious one.

Stef Aupers and Lars de Wildt (Chapter 3) then address the role of the Internet in undermining the authority of science. They demonstrate how its open, decentralized, and non-hierarchical structure empowers non-academic audiences to construct their own truth claims, often in marked contrast to established scientific ones. This is because the Internet

enables non-scientists to collect their own 'data', formulate their own 'truths' and ultimately 'scientifically' defend the latter online, often in virtual 'echo chambers' that offer social consolidation rather than skeptical counterarguments and critique. This situation on the Internet, the authors argue, both exemplifies and contributes to a culture of epistemological insecurity.

Rudi Laermans (Chapter 4) then addresses how science is also losing ground in its traditional institutional stronghold, the university. For many a university today opens up to the arts, e.g., by introducing PhD programs in the arts and embracing art-based research. He demonstrates how articulations of 'artistic research' hover between a more traditional science-informed view and a stance defending the particularity of artistic practices. While such practices are obviously contested, especially among those who stick to traditional conceptions of 'science' and 'truth', it is nonetheless quite clear that the latter are losing ground in academia.

Finally, Marleen Brans and Sonja Blum (Chapter 5) discuss the profound changes that have occurred in the realm of policy research, where the hierarchical relation between scientific experts and non-scientific stakeholders of the past has largely dissolved. The latter's understandings are no longer downplayed as basically irrelevant, irrational, and in need of correction by expert knowledge, but have come to be taken very seriously.

4. Religious Purification and the Authority of Religion and Science

4.1. Religious Purification

Since the end of the twentieth century sociology of religion has witnessed the emergence of a theory about a profound transformation of religion since the 1960s. Acknowledging that religion's customary institutional aspects (i.e., organization, doctrine, ritual and the like) have lost much of their former traction (e.g., Davie, 1994), this theory holds that this has coincided with a quest for purification that has resulted in a 'spiritual turn' in religion (Heelas and Woodhead, 2005; Houtman and Mascini, 2002; Houtman and Aupers, 2007). The theory accounts for the increasing numbers of westerners who self-identify as 'spiritual but not religious', producing utterances like, "No, I am not religious; I want to follow my personal spiritual path" or "I do not believe in God, but I do believe that there is 'something'." On the basis of such evidence Heelas and Woodhead (2005) have suggested

that a 'spiritual revolution' may be underway, consisting of a major transition from 'religion' to 'spirituality', while Campbell (2007: 41) even goes so far as to observe "a fundamental revolution in Western civilisation, one that can be compared in significance to the Renaissance, the Reformation, or the Enlightenment."

This spiritual turn entails the dissemination of a specific type of religious discourse that does not want to be mistaken for the Christian religion of the past and that as such sets itself apart from religion's traditional organizational-institutional entrapments. Among those who self-identify as 'spiritual, but not religious' this spiritual discourse is commonly accepted and basically uncontested. It dismisses firmly established religious traditions and institutions to instead underscore the need of 'following one's personal spiritual path' by taking one's own experiences, feelings and intuitions seriously. This common discourse does as such give birth to the practices of personal bricolage, syncretism and spiritual seeking that Luckmann (1967) and many others in his wake have misconstrued as strictly privatized (see for critiques: Aupers and Houtman, 2006; Besecke, 2005; Woodhead, 2010). For in fact this is an excellent illustration of religion in the classical Durkheimian sense, i.e., religion as a shared cultural discourse organized around a binary distinction between 'the sacred' (here: the free and authentic person that one 'at deepest' is) and 'the profane' from which it needs to be set apart (here: the institutions and traditions that reduce one to a mere puppet on a string) (Alexander, 1988; Durkheim,1995 [1912]).

A cultural-sociological understanding of the spiritual turn in religion thus highlights how the spiritual discourse construes the institutional idiosyncrasies of religious traditions as basically human-made, 'invented' side issues that distract from what religion is (or rather: should be) 'really' about: engaging in a personal contact with the sacred (Roeland et al., 2010). Articulating ideals of 'pure' religion and 'real' sacrality, this spiritual discourse thus posits that the sacred can neither be captured in human-made institutions nor reduced to religious doctrines, which leads it to dismiss religious institutions and doctrines as false, shoddy, mundane and ultimately profane. It does as such not unequivocally reject religious traditions, but rather understands them as placing too much emphasis on ritual conformity and institutional and doctrinal side issues. Religious traditions are in effect understood as 'basically', 'deep down' referring to the same spiritual source and hence as more flawed and misleading to the extent that they define themselves as different from, conflicting with, and superior to others. This spiritual notion that what religious traditions have in common is more important than what sets them apart is known as 'polymorphism' (Campbell, 1978: 149) or more typically 'perennialism' ('There are many paths, but there is just one truth').

The spiritual turn in religion, in short, entails a quest for 'pure' religion that dismisses religious institutions as standing in its way, in effect conceiving the latter as 'impure'. 'Real' religion is here hence construed as religion that goes beyond humanly invented institutional side issues, that foregrounds the importance of a personal connection with the divine, and that underscores the need to take the resulting experiences seriously in organizing one's life and making personal decisions about what to do and what to avoid.

4.2. Part II of the Book: Vexations about Scientific Impurity

Such purification processes do not remain confined to religion, as can for instance be seen in populist rejections of contemporary politics as lost in the institutional side issues of party-centered politics, while neglecting what ought to be central to democratic politics, i.e., the interests of 'the people' (e.g., Canovan, 1999; Houtman et al., under revision). Within the realm of science, similar tendencies testify of a profound anti-institutionalism that plays off ideals of 'pure science' against debatable practices identified with science's traditional institutional bulwarks, i.e., universities and research institutes. The latter are critiqued for obstructing scientific ideals of democratic and critical openness and for tending towards submissive 'Big Science', selling out to 'Big Corporations' and 'Big Government'. Similar complaints about the 'impurity' of today's science can be heard from within the academy itself, where they are expressed as discontents about the ways in which competition between universities and neoliberal funding regimes straightjacket, trivialize, and commodify the results of scientific research.

The three contributions that make up Part II of this book explore such vexations about the impurity of science. Peter Achterberg, Willem de Koster and Jeroen van der Waal (Chapter 6) analyze survey data to demonstrate that, unlike what is often believed, the lower educated embrace unbiased scientific research as much as the higher educated do. They also show, however, that the lower educated are more skeptical than the latter about whether everyday scientific practices do actually live up to this ideal. Distrust of science among the lower educated does as such not stem from a rejection of the scientific endeavor *per se*, but rather from a lack of generalized social trust that does not remain limited to scientific institutions but extends beyond it to institutional realms like politics.

Jaron Harambam and Stef Aupers (Chapter 7) present similar findings from an ethnographic study of conspiracy theorists, who are a vociferously present among today's critics of science. Branded as dangerous, irrational and deluded loonies by scientists, they

do again not reject the scientific endeavor *per se*, but accuse modern science of being insufficiently scientific itself. In their eyes, science has increasingly lost its skeptical edge and has become dogmatic. The scientific endeavor, they argue, is consistently sacrificed to corporate and political interests, while scientists have allegedly become part of a global power elite whose practices cannot stand the light of day. These critics of science do indeed pride themselves on being more skeptical and critical than the typical academic scientist.

Massimiliano Simons (Chapter 8), finally, discusses the Do-It-Yourself biology movement, also known as 'biohacking', 'biopunk', or 'garage biology', which aims to make synthetic biology accessible to all. Much like the conspiracy theorists discussed by Harambam and Aupers, DIY biology accuses the universities of having killed 'the free spirit of science' and having degenerated into dull and routinized research factories: lost in bureaucratic and economic side issues, enlisted by powerful states and corporations, and in effect no longer hospitable to 'real' science, driven by idle curiosity.

5. The Cultural Significance of Religious Worldviews

5.1. Max Weber and Emile Durkheim about Religion and Meaning

Despite their otherwise major differences, the classical sociologies of religion of Max Weber and Emile Durkheim both address religion's significance beyond a strictly defined religious realm. More specifically, they both foreground the role of religious worldviews in endowing the world with meaning, i.e., in distinguishing between what is 'good' and what is 'bad' and in pointing out the action repertoires that the religiously pious should pursue or rather stay away from.[1] This third theory about religion does as such not explain the endorsement or rejection of the authority of science generally, but rather why groups differ as to the types of truth claims they tend to accept as unbiased and valid or reject as false and invalid.

Weber's most famous study, *The Protestant Ethic and the Spirit of Capitalism* (2005 [1904/05]), addresses just one single link within a much more extensive account of the economic consequences of the world religions (Collins, 2007). For from other-worldly Buddhism or Sufi mysticism to the stratified caste system of Hinduism to the harmonious worldview of Confucianism to the rationalist, inner-worldly tradition of sixteenth-century

Calvinism, Weber maintains, all of these religious worldviews motivate particular modes of conduct, not least within the economic sphere (Weber, 1946 [1921]; 1963 [1922]). Whereas according to Weber religions like Buddhism and Confucianism discouraged mundane economic activities, Protestantism's combination of inner-worldliness and asceticism rather motivated active entrepreneurship. Especially in its more orthodox and puritanical renditions, Protestantism as such did much to stimulate the rise of modern capitalism in the sixteenth century.

Weber hence observes a cultural 'resonance' between the Calvinist ideal of a sober, disciplined and economically active lifestyle on the one hand and the spirit of modern capitalist entrepreneurship, defined by its incessant, calculated, goal-rational dealing with capital and other production factors, on the other. Weber refers to such a selective cultural 'resonance' that leads two phenomena to attract each other as *Wahlverwandtschaft* ('elective affinity') (Howe, 1978; Löwy, 2004). While *The Protestant Ethic* famously addresses a case of *positive* elective affinity, culturally meaningful phenomena can of course also repel each other due to *negative* cultural resonance, which would be an instance of *negative* elective affinity. Positive and negative *Wahlverwandtschaften* between religious or cultural worldviews on the one hand and particular types of scientific truth claims on the other do as such provide an explanation of why the latter are either accepted as true or rejected as false.

In *The Elementary Forms of Religious Life* (1995 [1912]) the late, cultural-sociological Durkheim similarly addresses religion's consequences beyond a strictly defined religious realm. In doing so, he came back full circle to the position that he had initially dismissed in *The Division of Labor in Society* (1964 [1893]). For the early, positivist Durkheim still argued that religion could only provide cultural cohesion and solidarity in pre-modern societies ('mechanical solidarity'), so that their modern counterparts could only be based on 'organic solidarity', brought about by an awareness of the interdependencies that come with the modern division of labor. The late Durkheim, however, maintains that all societies, pre-modern and modern alike, are held together by a common religion. In making this argument Durkheim understands religion as a group-based "unified system of beliefs and practices relative to sacred things, that is to say, things set apart and forbidden" (1995 [1912]: 44). Religion here does hence not necessarily entail supernatural beings, but rather something deemed so special and so important that it needs to be set apart, celebrated, and protected against pollution by the mundane and the everyday. Religion here thus pertains to beliefs about what is 'sacred' and what is

'profane' and to the ritual practices that sustain this distinction and protect the former from pollution by the latter.

Much like Weber's *Wahlverwandtschaft* approach, then, Durkheim's cultural-sociological approach also invokes distinctions between phenomena that do and that do not resonate positively with a cultural worldview. Here this is because cultural worldviews are informed by distinctions between the sacred and the profane, with the sacred defined as in need of protection against pollution by the profane. Cultural worldviews hence define what types of scientific truth claims sustain the sacred and what types threaten to harm, pollute or invalidate the latter as manifestations of the profane. In other words, cultural worldviews lead the former truth claims to be embraced and the latter to be neglected, discarded and dismissed. Whereas Weber's and Durkheim's sociologies of culture and religion differ profoundly in other respects, in short, they do nonetheless both suggest that cultural worldviews matter a lot when it comes to the acceptance or dismissal of scientific truth claims.

Indeed, theories based on a positivist distinction between 'reality as it really is' and 'culture and belief' lead to much the same expectations for basically the same reasons. The most prominent examples are theories about 'confirmation bias' (Nickerson, 1998), 'motivated reasoning' (Kunda, 1990), and their logical counterpart, 'avoidance of cognitive dissonance' (Festinger, 1962). For like positive elective affinity in the Weberian sense and celebration of the sacred in the Durkheimian sense, 'confirmation bias' and 'motivated reasoning' do also refer to the tendency to positively appreciate information that appears compatible with pre-existing beliefs. 'Avoidance of cognitive dissonance', on the other hand, constitutes the logical counterpart of confirmation bias and motivated reasoning, i.e., the tendency to try and avoid feelings of discomfort invoked by information that appears to challenge one's pre-existing beliefs (see, e.g., Manjoo, 2008). This can as such also be understood in terms of either negative elective affinity (Weber) or protection of the sacred against pollution by the profane (Durkheim). Yet, despite these convergences there remains one major difference between Weber's and Durkheim's cultural-sociological theories and these positivist ones. For the former raise doubts about the very likelihood (or even: the sheer possibility) of 'unbiased' or 'strictly objective' knowledge and 'non-motivated' reasoning, which is precisely why Weber and Durkheim do not construe deviations from the latter as 'irrational' or 'morally reprehensible'.

5.2. Part III of the Book: Cultural Allures of Scientific Evidence

The third and final part of this book addresses these classical theories about how different worldviews lead to differences in the acceptance or rejection of scientific truth claims. Liza Cortois and Anneke Pons (Chapter 9) demonstrate that even though orthodox Protestants and spiritual adherents of mindfulness share an interest in research that demonstrates the plasticity of the brain, they differ profoundly in terms of the specific types of knowledge claims they feel attracted to. Whereas the spiritual group gravitates toward claims that the brain can be 'improved' by means of meditation, the orthodox Protestant group is primarily interested in how modern media use 'damages' the brain. These diverging interests, the authors argue, stem from different elective affinities sparked by different worldviews.

Paul Tromp and Peter Achterberg (Chapter 10), finally, present experimental evidence of the role of cultural worldviews in understandings of truth and falsity. Using news messages about the findings of a fictitious study on climate change they demonstrate that laypersons' interpretations of the reported findings can be attributed to their worldviews. This goes even further than the findings reported in the previous chapter, because it shows that people with different worldviews do not only have their own particular pet research findings, but even interpret the very same 'facts' in terms of their own worldview.

6. Conclusion: Science under Siege

Today's contestations of the authority of science are too interesting and too intellectually significant to be merely mourned and protested against. For it is clear that they sit quite uneasily with the long-standing notions of a fundamental dissimilarity and conflict between religion and science (Evans and Evans, 2008) and of social change as resulting from a 'warfare of science with theology' (White, 1960) or a 'religion/science conflict' (Sappington, 1991). According to the latter understanding, the unfolding of modernity results in a displacement of religion by science, i.e., a transition from authority of religion to authority of science. In sociology, this notion informs theories of modernization and secularization, with sociologists of religion maintaining that science has increasingly taken over from religion, so that nowadays particularly for young people "problems of any kind have technical and rational solutions" (Wilson, 1982: 136).

One needs to be skeptical about such claims. Although the authority of religion has since the 1960s surely declined significantly in most Western-European countries (e.g., Brown, 2011; Bruce, 2002; Norris and Inglehart, 2004), and also – though less typically acknowledged – in the United States (Voas and Chaves, 2016), not much systematic research (if any) has addressed changes in the authority of science during this period (see for an exception Gauchat, 2012). This indicates that (at least until very recently) the notion of an increase in the authority of science at the cost of religion has enjoyed the status of an article of faith rather than a scientific hypothesis in need of critical empirical testing.

Indeed, increased contestations about the authority of science suggest that accounts of the declining authority of religion may tell only half the story. What seems to have eroded instead is something more general and more fundamental, i.e., the acceptance of universally binding truth claims, be they religiously or scientifically informed. Such a dual decline of the authorities of religion and science alike does in effect not signal a process of 'modernization', but rather one of 'postmodernization' in which religion and science alike lose their former authority (e.g., Bauman, 1987, 1992; Inglehart, 1997). Precisely because such a process entails a major rupture with how the modern West has traditionally understood itself as well as its further development, there is ample reason to open up these and related issues for systematic empirical study.

Yet, as we have seen, lamentation, disapproval and political protest are more typical responses, with scientists, politicians and journalists bemoaning 'anti-intellectual' currents and critiquing those who 'irrationally' refuse to accept the authority of science. These are textbook examples of 'boundary work' (Gieryn, 1972; 1999) that create an asymmetrical divide between 'us' and 'them' and re-assert precisely the pretensions of modern science that are so heavily contested nowadays. Such boundary work moreover obscures that critiques of contemporary science are also expressed from within academia itself, not least from within the humanities and social sciences, and not least about science's instrumentalization and subordination to political and economic interests. Indeed, unlike academic prophets of doom have it, eradicating misplaced pretensions of strictly objective and unmediated truth may not so much lead to the end of science, but rather open the door to better science – science that is more critical of long-standing scientific practices and self-understandings that impede the quest for truth.

We are indeed quite skeptical about un-reflexive moralistic dismissals of public discontents about science. We are equally skeptical about lukewarm attempts at restoring public trust in science by getting citizens involved in scientific research (e.g., Riesch and

Potter, 2014).[2] To the extent that today's discontents about science pertain to misplaced scientist pretensions and science's intimate connections with vested political and economic interests, a more fundamental reflection is called for. Indeed, as one of the sociological pioneers of the study of science already pointed out amidst World War II, long before the unrest that would break out at the academic front in the 1960s: "An institution under attack must reexamine its foundations, restate its objectives, seek out its rationale. Crisis invites self-appraisal" (Merton, 1973a [1942]: 267). With this volume, we hope to make a modest contribution to such a more fundamental reflection.

Notes

[1] Precisely this common notion that religion informs people's cultural understandings of the world, and in effect drives their lifestyles, too, makes the classical sociologies of religion of Weber and Durkheim such valuable blueprints for cultural sociology (e.g., Alexander, 1988; Houtman and Achterberg, 2016).

[2] Giving voice to democratic and participatory ideals, this so-called 'citizen science' entails initiatives by universities and governmental bodies to get citizens involved in the research process (Riesch and Potter, 2014). Examples are amateur archeologists, astronomers, biologists, hackers, and other lay volunteers collecting data in co-operation with professional scientists, sometimes on a worldwide scale. It remains to be seen whether such citizen science can actually help restore public trust in science by wiping out excesses of scientism, not least the intertwinement of academic research, governmental policies and profit-driven corporations. On a skeptical note, citizen science may in practice entail not much more than the instrumentalization of citizen scientists in large-scale unpaid data collection for state-sponsored research projects that align seamlessly with hegemonic political and/or commercial agendas.

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