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1. Introduction

Arguments are said to be valid/invalid, sound/unsound, good/bad, strong/ weak, convincing/ unconvincing. Normally without great concern for metaphysics, a *persuasive force* might be ascribed, either as an additional feature or perhaps entirely based on dialogical circumstances. Following Rehg, such terms remain somewhat useful, but their use can be recovered and improved by adopting 'cogent' and its cognates, especially when dealing with scientific argumentation which bears on public policy. In his critical contextualism, cogency links

> a normative idea, the strength or logical character of good reasons, with a psychological effect on audiences, namely, the perception of a persuasive force that is not easily resisted. Thus the idea of cogency sits at the boundary between psychological effect and rational content. Moreover, the broad association of 'cogency' with persuasiveness suggests that cogent arguments include not only logically valid deductions but also inductive arguments with sufficient probability (or plausibility) to persuade. (p. 6f.)

The central question of the book: "[W]hat is it that makes scientific arguments cogent, and how ought we reasonably to assess that cogency?" (p.

3f.) is an invitation to follow a prolific, well-read and integrative author into the details of cases studies (rather than their idealizations), while engaging critically with discourse theory. On occasion of Habermas's 80th birthday this year, Rehg's book is less a present than a comprehensive account of how to describe and assess, in an interdisciplinary manner, the quality of socially relevant scientific argumentation *without* invoking transcendental or *a priori* categories.

Comprising nine chapters, two postscripts and an introduction, the book is organized into three parts: Part I treats the social factor in argumentation and the post-Kuhnian rationality debates, a.k.a. "the science wars" (e.g., global warming, creationism), particularly their relativistic inclination. As a possible response to Kuhn's challenge, part II engages critically with the discourse theory of Habermas whose dialogical ideals, particularly their status as necessary but counterfactual idealizations, are found wanting. Part III contextualised these ideals (metaphorically speaking: pulling them down to institutional earth) and elaborates "a multidimensional conception of cogency that pulls (…) different approaches together, integrating logical, rhetorical, and sociological tools for purposes of cooperative critical assessment of scientific arguments" (p. 8), to be applied in what Rehg calls *critical science studies*.

Mostly based on excerpts, the following summarizes and provides elaboration of Rehg's ideas. Anticipating the evaluation (sect. 3): Rehg delivers on all accounts. If you have recently used the term 'relativism', perhaps with an attitude of joy, disgust or honest incomprehension, then this book is worth reading carefully. Its content is at least equally important to a number of fields, amongst them: argumentation theory, philosophy of science, political science, rhetoric, sociology, science studies and science journalism.

2. The chapters

In chapter 1, *Science as Argumentative Practice*, Rehg seeks to establish an understanding of (natural) scientific inquiry according to which

> the daily struggle with the physical world in the laboratory of in the field is (…) *oriented towards* the development or construction of an argument

> – indeed is part and parcel of the constructive process, where 'construction' simply refers to putting together the evidence required to support a publishable result. (p. 19)

The claim is based on a rejection of the logical-empiricist 'discovery-justification distinction' and is to the effect that "the notion of argumentation I employ here takes in, as part of its substance, the discovery process itself" (p. 20). Rehg adopts a broad view of rhetoric, according which it studies "all the ways by which meaning is created symbolically among people (Wenzel 1987, 106)" (p. 21). Consequently, he can claim that "rhetoric need not be at odds with ideals of objectivity" (*ibid.*). At the same time, he is careful not to equate the terms 'rhetoric' and 'argumentation studies'. The idea is to "use the term rhetoric to designate a specific perspective on science, albeit a perspective whose interpretation, scope, and relation to other perspectives vary according to different theories of science (…)" (p. 22). And "[t]to use the term 'argumentation studies' (…) as an umbrella to cover the multidisciplinary complexity" (p. 22) which to adequately address, theorize and understand – or so Rehg may be understood– will at least be aided by his (boundary-)concept of 'cogent argument'. In first approximation, the term 'cogent' may be understood as a "broad synonym for argument strength and/or persuasiveness" (p. 7).

Building the heuristic framework for his inquiry, Rehg interprets Wenzel's (1990) distinction between a *rhetorical*, a *dialectical* and a *logical* (normative) perspective and places these terms alongside 'arguing' as social process, 'argumentation' as cooperative procedure (or method) and 'argument' as product (p. 24), such that "each row represents one dimension of, or perspective on, argument that interpenetrates the other two" (*ibid.*). Here, "[t]he term 'argument' has both a narrow and comprehensive usage (…). As one dimension, 'argument' refers to the package of reasons supporting a conclusion; as a multi-dimensional social practice, 'argument' takes in all three dimensions" (p. 25). In this "loose alignment of (…) triads" (*ibid.*), he finds a "multidimensional framework" (p. 24) or a

> perspectivism, as I shall designate it, [the value of which] lies in its hermeneutic and evaluative breadth, and thus in its serviceability as a heuristic open to a range of approaches and foci that make up argumentation stud-

> ies as a field. Although the three perspectives do not exhaust the approaches, they do seem to capture the central normative perspectives on argumentation. Perspectivism thus provides a kind of heuristic for reading developments in science studies over the last half-century (…). Moreover, as a set of normative perspectives on argument evaluation, this framework might be taken as a multidimensional account of cogency: the different ways one can understand or assess the cogency of arguments (p. 25).

Rehg then submits these well known triads to criticism (pp. 25-28), foremostly noting complications with respect to the neatness of the above distinctions. "These complications – above all the slippage between the two triads lead me to suggest that we simply break up the one-to-one alignment between product-procedure-process and logic-dialectic-rhetoric" (p. 28).

The reader is led to understand that "perspectivism as a heuristic framework does not function as an architectonic, a predefined grid into which we squeeze the various initiatives in science studies" (p. 30). Rather, by making heuristic use of old terms, and allowing in new ones, e.g., "social-institutional perspective" (p. 29), we may pose "direct specific questions to the theories, case studies, and proposals in science" (p. 30). Over and above a commitment to a (non-sceptical) critical evaluation (p. 31), the basic idea is that scientific inquiry at least *centrally involves*, perhaps *crucially depends upon* argumentative practices, while "sceptical approaches that dismiss or reduce the logical perspective to the rhetorical, or to sociological explanation, are at odds with the argumentation studies framework I propose" (*ibid.*).

As for constraints, the "theorist must take a hermeneutic approach oriented toward disclosing the norms operative within scientific inquiry" (*ibid.*), while "hegemonic claims for a particular discipline of perspective are counterproductive" (*ibid.*) Thus, one might generally say, Rehg's interdisciplinary project studies the *argumentative factor* in scientific inquiry. This meta-inquiry into standards uses argumentation theoretic categories without, from the start, claiming that argumentation studies shall serve as the master discipline (*ibid.*).

In chapter 2, *Kuhn's Gap: From Logic to Sociology*, Rehg contrasts what he identifies as the logical empiricist vs. Kuhn's (and, in extension, the sociology of scientific knowledge [SSK]) perspective on scientific argumenta-

tion. The logical empiricist perspective is presented as a normative (or: prescriptive) and primarily syntactical formal calculus of hypothesis-confirmation by evidence(-statements). This, however, cannot be directly applied to scientific discourse without considering the pragmatic choices of particular contexts. Crucially, formal rules for hypothesis (dis-)confirmation do *never fully* translate into rules for the scientist's rejection or acceptance of a theory. Nevertheless, from Hempel's and Carnap's early 20th century work on a confirmation theory (viz.: inductive logic), Rehg draws implications for the evaluation of cogent evidential argument. Here, so called "intrinsic formal merits" (p. 42) –"relevance, support, strength of support, and valid structure" (p. 41)– play the greater role, but are always *enriched* by pragmatic considerations:

> By making the acceptability of premises a pragmatic or conventional matter, Hempel, like other logical empiricists, injects a context-dependent, sociological element into his account of scientific inquiry. He thereby introduces a division between the logical and pragmatic aspects of cogency. (…) So long as the language in which the observational premises were formulated was neutral vis-á-vis competing hypotheses, and so long as the logical framework of comparison remained purely formal, then the pragmatic side of inquiry did not undermine the possibility of an impartial comparison of the relative strength of the arguments for one hypothesis over its competitors. By vividly displaying the fragility of these assumptions, Kuhn turned this division into a contentions gap in the analysis of scientific argumentation. (p. 42)

In contrast, Kuhn's perspective amounts not merely to an enrichment of formal by pragmatic evaluative criteria, but to "substituting a social-institutional perspective on the process of argumentation for the logical perspective, whether formal or informal, on its products" (p. 49). As Rehg outlines, this replacement has given rise to two research strands within SSK: "the rule sceptical approach of the Strong [Edinburgh] Program and the particularist approaches of certain ethnographers, above all ethnomethodologists" (p. 50). As for the first, "[t]he rule sceptics downplay the normative dimension in theoretical development as explanatory of theoretical development in science" (p. 52). On their perspective:

> [H]ow one ought best to extend [current] science is underdetermined by inherent theoretical content, past usage, and evidence (natural phenomena). To explain theory change, (…) one must look to sociological models of causality: interest constellations, distributions of power, social networks and the like" (p. 51).

Similarly, "[p]articularists agree with Strong Programmers that the normative standards that guide the science community cannot be fully represented by general norms of rationality (…)" (p. 52). However, rather than replace (what are identified as) the logical empiricist's epistemic norms by social ones in order to explain theory change, the ethnomethodological particularist sees "no need to go beyond the normative self-understanding of practitioners and invoke a causal explanation of the development of science" (*ibid.*). Although not rule sceptical, but aiming at descriptions of "various rationalities (…) [that are] more or less unique to each local context" (*ibid.*), or so Rehg claims, particularism's "restriction to the participant level leads to a principled 'indifference' (…) [with respect to] standards of reasonableness for science" (p. 53).

Thus, what Rehg calls "Kuhn's Gap" refers to the "unmediated opposition between two perspectives on scientific argumentation" (*ibid.*). One favours "analyses of cogent argument in terms of formal or substantive properties of the product" (*ibid.*), while the other focuses on "the social-institutional contexts and processes from which these arguments emerge" (*ibid.*). Here, each perspective names as a condition for the cogency of argument that which the other finds irrelevant or, at least, less relevant. Faced with this gap, Rehg's concept of cogency shall primarily serve to mediate, insofar as "these different accounts [logical empiricism, Kuhn's theory of science, SSK] all want to say something illuminating about the actual practice of scientific inquiry" (p. 56). Moreover, "the appeal to praxis [as opposed to calculus] allows us to regard theories of cogency as attempts to explicate the 'social practice of cogency,' so to speak – the social-practical structures that underwrite the ascription of cogency in scientific argument-making" (*ibid*). Consequently, in Rehg's terms, the challenge is to construct a broader framework to "bring these different conceptions of cogency together in fruitful cooperative exchange" (p. 56) in order to "overcome Kuhn's gap" (*ibid.*).

On Rehg's diagnosis, we currently cannot make a *smooth* transition be-

tween (not to speak of integrating) a logico-methodological and a sociological-institutional perspective on theory change, broadly construed. When trying, we always project our slipping into a gap, the depth of which is uncertain, and which is intimately associated with relativism. In Rehg's metaphor, his project is an attempt at *treating* this gap.

In chapter 3, *Closing the Gap: Three Rhetorical Perspectives on Science*, "rather than cover the rhetoric of science as a field (…), much less the rhetorical perspective in general" (p. 57), Rehg focuses "on three particular ambitious theoretical initiatives (…)" (p. 58) which seek to fill out "the microdynamics of persuasion and theory change" (*ibid.*), namely that of Marcello Pera, Lawrence Prelli, and Bruno Latour. Their contributions are read as gap-closing approaches *en route* to a *comparative* concept of cogency in scientific argument. Latour's is gap-*closing* in a special sense (see below).

Pera's primarily dialectical conception of comparative argument cogency is said to replace the logical empiricist methodological rules as the normative arbiter with the science community and the tradition it carries on, although "the community's sense of procedural and substantive demands of rational debate" (p. 63) are ultimately understood as historically contingent. According to Pera:

> [A]n argument A is more cogent than B just in case (a) the community judges A to be stronger than B after rational discourse, as defined by the accepted dialectical factors, and (b) that judgement is not reversed at a later stage of rational discourse (although A might be superseded by argument C). It follows (…) that at any stage of discussion and inquiry, successful arguments can enjoy *at most a presumption* of being more (or less) cogent than their competitor. (p. 64, *italics added*)

However, so is Rehg's main criticism, specifically social aspects (How to organize the community?) remain largely outside of Pera's analysis, resulting in an "'intersubjectified' [rather] than a 'socialized' account of scientific progress" (p. 64).

Next, Prelli's rhetorical criterion (see below) is presented as a partial, though ultimately insufficient supplement to Pera's analysis, by virtue of "elucidating the rhetorical substance of the rational discourse referred to in

Pera's dialectical model of cogency" (p. 69). Although, by "linking a normative conception of cogency with audience psychology [persuasion], Prelli's rhetoric adds a social layer not found in Pera (…), he does not [as, in Rehg's opinion, he should] link persuasion with specifically sociological aspects of science" (*ibid.*), for example: "institutional mechanisms such as peer review, funding structures, gate keeping, and so on" (*ibid.*). Prelli's "rhetorical, pragmatic criterion governing the logic of reasonable scientific discourse" (p. 67), if perhaps well applicable to scientific discourse, remains – for Rehg problematically so – confined to community-relative (or: communitarian) standards. It runs as follows:

> [T]o be judged reasonable and persuasive in any specific situation, scientific discourse must be perceived as identifying, modifying, or solving problems that bear on a specific scientific community's maintenance and expansion of their comprehension of the natural order. (p. 67, cited as Prelli 1989a: 122-13)

On Prelli's account, an argument "becomes better – actually persuades, is more cogent than competitors – only if it responds insightfully to the actual constellation of positions held by members of the audience" (p. 68). *Pace* the criticism that this account of the "microdynamics of persuasion" – the analysis part of which proceeds on a *topoi cum stasis* model around four "rhetorical exigencies" (from *evidence* over *meaning*, *significance* to *action*; p. 66) –, is mechanical rather than informative, Rehg praises it for being "more substantial and contextual than formal logic and more normative than psychology and sociology" (p. 67). Moreover, he explicitly accepts "the three main rhetorical tasks – selecting an exigence and specific issues and developing situationally reasonable lines of argument" (p. 70) as helpful in the analysis of cases.

Nevertheless, "[t]he danger lurking in such a communitarian approach is that it 'underestimates the potential ideological functions of science in contemporary culture' (Taylor 1996: 106)" (*ibid.*). With reference to Habermas and the chapters to come, this danger is characterized as a conventionalism that "eschew[s] universal norms of cogent argumentation" (p. 71). Along with Pera's and Prelli's, also Toulmin's work (as Habermas reads it), in particular his *field dependent* standards of argument validity, are said

to disqualify on account of staying "science-internal", i.e., drawing "norms of cogency from conventions specific to each disciplinary field of argument" (p. 71).

Lastly, Latour's attempt to address Kuhn's gap by an actor network theory (ANT) is presented. Rather than fill it, Latour's strategy is to level the gap. Along with rejecting "intrinsic and process-independent notions of cogency" (p. 76), Latour "rejects any prescriptive view of cogency" (p. 77), as his main methodological assumption keeps him from distinguishing knowledge and power. Consequently, on his view, "[t]he more cogent argument is simply the one that de facto succeeds in 'trials of strength'" (p. 77). Catchphrase: "The strongest reasons always yield to the reason of the strongest (Latour 1988: 186)" (*ibid.*). Taking cogency to be entirely factual, and with particular respect to the journal article as a scientific product,

> Latour thus explains the apparent cogency of arguments in terms of networks of actants (human and nonhuman) with which arguments are allied and through which they can successfully travel (…). So we might say that the cogency of an argument – the article as a product of inquiry – is constituted by its ability to enlist in its support, and travel (translate) through, heterogeneous material, social and political networks. The greater its power of travel, the more cogent the argument. (p. 77f.)

Thereby, Kuhn's distinction between "normatively sound argumentation [and] institutionally effective rhetoric" (p. 78) is said to be levelled. Therefore, in Rehg's opinion, like Pera and Prelli, also Latour fails to bridge the gap, although already in a trivial sense of failing, since Latour principally rejects the normative perspective. In contrast, Rehg reads Prelli to have tied the above distinction together, such that effectiveness becomes part of a normative criterion of cogency (*ibid.*), to yield a "normative rhetoric of science in the thick sense (…) [attending to] specific demands of rhetorical invention in relation to features of the concrete audience" (p. 79), while Pera "assimilates the logical and the social within a *dialectical perspective* on science as a conceptual process" (*ibid.*).

All the same, Rehg finds a particular merit in Latour's (politically motivated) "use of SSK methods to study 'science in the making'" (*ibid.*) for the purpose of "dismantling the Enlightenment dichotomies that legitimate

Western science" (*ibid.*), without succumbing to a principled relativism, here ascribed to Bloor (Strong SSK Program).

> [B]y giving natural phenomena [i.e., nonhuman actants] a constitutive role in persuasive argumentation, Latour acknowledges, in a backhanded sort of way, the rationalist, empirical side of Kuhn's Gap, which highlights empirical adequacy as the primary consideration in an account of argumentative cogency. His analysis thus ties the empirical adequacy of arguments with their ability to spread materially, socioinstitutionally, and technologically. However, it remains unclear how one would integrate Latour's strategic [Machiavellian] analysis with a prescriptive argumentation theory. (p. 80)

As Rehg claims, "[p]ulling these perspectives together into a coherent normative conception of argument cogency sets the task for the second and third parts of the book" (p. 80).

In the postscript to part I, *The return of the Logical: Achinstein's Realist Theory of Evidence*, Rehg discussed Peter Achinstein's (2001) objective theory of evidence, in particular "the way in which his theory links evidence with a realist (…) mind-independent notion of truth" (p. 82). Coming from "a tradition of attempts to understand inductive confirmation" (p. 81), Achinstein's theory is read to deliver cogency as an impersonal merit, based on an epistemic situation (ES) model of evidence (p. 85). Adopting large parts thereof, Rehg objects that Achinstein's theory unduly leaves the communicative aims of argumentation outside.

On Achinstein's model, the transition from evidence E to hypothesis H is taken as an *explanatory inductive* inference. The inference counts as justified *if and only if* E is evidence for H "in virtue of physical and mathematical facts, independently of whether anyone knows it or not" (p. 85) (This is the objective part). Moreover, "[t]o say that the 'E provides a good reason to believe H' means that E is a reason to believe H *rather than its negation*" (*ibid.*, *italics added*). In particular, given background assumptions, B, the model requires that, for E to be potential evidence for H (as opposed to veridical evidence for H), (i) H and B must be true, (ii) without E entailing H deductively (ii seems to be the inductive part). Furthermore, (iii) the probability that there is an explanatory connection between H and E, given the

logical conjunction of E and B, must be greater than one half (p. 86). Rehg notes: "[T]he objective character of the explanatory connection (…) ensures the impersonal character of relevance: it is not audience relative" (p. 87).

In the following, Rehg reads Achinstein's as an "objective model of cogency" (p. 88). In particular, Achinstein's idea of an epistemic situation yields 'ES-evidence' (in distinction to potential evidence) as that which is made available by and, thus, holds relative to available experimental techniques and methods. Note that, in this model, E is either true or no ES evidence for H, to begin with. Rehg understands E primarily as "experimental results" obtained under "the available methods for testing and inference" (94). Branding it as a logical empiricist insight, however, he adopts that "one can at most *take* E as true, insofar as it is justified in the light of corroborating observations and available knowledge" (*ibid.*). To account for the fallibility-objection while serving in a theory of argument cogency, Rehg submits, the truth condition on Achinstein's ES-evidence must be replaced with a justifiability condition.

> Achinstein's theory of evidence suggests the following distinction for a conception of cogency: (1) a (synthetic) definition of veridical evidence that captures the truth at which scientific inquiry aims: true hypotheses supported by true evidence-statements and assumptions; (2) a (synthetic) definition of ES-evidence that, if shorn of its truth condition (that E must be true), aligns cogency with properties of the arguments that scientist are in a position to make and assess; insofar as those arguments succeed at providing cogent justification, they fallibly indicate success at the representational aims of argument, as stated in (1). (p. 95)

So understood, cogent arguments count as providing the "sole indicators of truth" (*ibid.*). Moreover, "as a fallible means to truth, arguments as justifications make sense in view of a representational enterprise whose success is measured by the world" (*ibid.*). Thereby, "two important features of scientific practices, namely the potential for controversy and the commitment to ongoing research" (p. 93) can be explained, insofar as "ES-evidence makes the acceptance of an argument product reasonable even though there are unknown defeating conditions (…)" (p. 89).

A cogent evidential argument will (i) state an explanatory connection

between E and H, given E and B, with a probability > 0.5, while (ii) E and B are true, (iii) E does not entail H, and (iv) one is justified, given the epistemic resources are one's disposal, in believing (i-iii) (p. 96f). This captures what a "scientist ought to strive for (…)" (p. 97). On this definition, cogency is impersonal; cogent arguments will "in part be constituted by the mind independent truth of their evidence and background assumptions" (*ibid.*).

However, when assessing the cogency of a given argument, one "assess[es] impersonal merits indirectly, as merits relative to specific challenges made by a particular community" (*ibid.*). Moreover, because "arguments are generally made *to lead addressees to accept* a particular conclusion as probably true or at least reasonable" (*ibid.*), the focus on "justificatory and representational properties of the argument product" (p. 98) misses that cogency must also take account of "the satisfaction of communicative aims" (*ibid.*). That is, success in the communicative aims of argument shall count as more than a "necessary means in the construction and assessment of arguments" (*ibid.*)

A crucial question which Rehg can now state (with the declared intent of reading Habermas' argumentation theory for an answer) is: Shall the concept of cogency collapse into "identifiable merits of the product" (*ibid.*) or shall it include having "emerged from a sufficiently reasonable process of argumentation (…), such that the same argument content could become more cogent as it held up under increasingly severe argumentative criticism" (*ibid.*)? Though Achinstein's model may provide a standard for cogency (in the sense of citing a correct, but an epistemically inaccessible criterion), Rehg argues, the latter characterization is a live option: Features of the process must count as necessary conditions for cogent argument in science.

Part II of the book, *Integrating Perspectives: Habermas's Discourse Theory*, starts with *Habermas's Critical Theory and Science: Truth and Accountability* (chapter 4), mainly an exposition and critique of his Theory of Communicative Action. This centres on the notion of the mutual accountability among rational subjects for the validity of claims (expressing propositions of empirical or normative content) raised in argumentative discourse. In particular:

> Habermas understands mutual accountability as a *defeasible pragmatic presupposition* – an imputation that participants mutually undertake

> but that cannot be definitely demonstrated by empirical observation. Accountability thus has the sense of a practically effective but possibly counterfactual 'as if' – an idealization or 'idea of reason' that has consequences for social interaction. (…) When actions fail to display the marks of rational agency, others are likely to withdraw their imputation and consider the offender irrational or unreasonable. (p. 114, *italics added*)

A participant's "general ability to *orient* her action by validity claims (Habermas 2003: 95)" (*ibid.*) then includes truth claims. Provided such claims to truth, should their content be true, are understood as intersubjectively acceptable beyond the present context of discourse, "[i]n making a truth claim in a particular forum, we 'implicitly assume responsibility (…) for demonstrating its rational acceptability in other relevant forums as well' (McCarthy 1994: 75)" (p. 115). In turn, such claims are understood to incur a (pragmatically necessary) presupposition of the objectivity world:

> The objectivity of the world, in the sense of its intersubjective accessibility, is thus an unfalsifiable presupposition by virtue of which actors anticipate that, 'all other things being equal,' competent observers should be able to reach unanimity in their factual reports (Pollner 1990 143, 150-51). Without this presupposition, neither the problem of discrepancy [between subjects' reports] nor the means used to resolve it are intelligible (ibid., 142). (*ibid.*)

Put succinctly: "The idea of a common objective world depends reciprocally on the idea of truth" (*ibid.*). While past versions of Habermas's account at least *linked*, in some interpretations *equated,* truth with an ideal consensus among rational participants, Rehg denies the direct route from objectivity through acceptability to final consensus. Instead, he sees our shared access to the objective world to always depend on available epistemic resources (p. 117). As it were, we always carry along a "kind of 'knowledge index' on truth claims" (*ibid.*). Given this index, and rather than explicating what it means for a proposition *p* to be true, Rehg offers the following "pragmatic presupposition of attempting to justify truth claims" (*ibid.*), abbreviated (JTC), which "states what it means in practice for us justifiably *to take p* as true" (p. 119).

> (JTC) If we reasonably consider our arguments to justify our taking 'p' to be true, then we must presume that our justification would prove convincing in a rational discourse that was maximally inclusive and rigorous, given current methods and knowledge. (p. 117)

Thus, "the idea of truth [is analyzed] as it functions sociologically, as an accountability structure" (p. 119). Thereby, truth remains objective and realist, in the sense that the truth-maker of a proposition is the objective world. But rather than explicating this correspondence theoretically – an endeavour beset with well known problems –, Rehg sides with Habermas's 'pragmatic epistemological realism' which allows us to understand "truth in the way it functions in action and learning" (p. 120). Simply put, if you may not be able to analyze objectively conceived truth, then rest content with analyzing its socially manifested consequences, as they must be understood by a philosophy after the linguistic turn.

The cogency of arguments, then, "rests partly on an internal relation between discourse (argumentation) (...) and experience and action (...), which in the sciences include observation and laboratory inventions" (p. 121). Thus keeping truth tied to ways in which truth-claims can be problematized in the historical development of science (e.g., in the light of technological development), renders it plausible to "say that such arguments, as internally related to laboratory 'experience,' are the only means we have for determining what is probably true" (p. 122). In this sense, Habermas's approach may be said to remain oriented towards context-invariant, transcendental norms (truth and validity).

According to Rehg, for (JTC) to be applied for purposes of critical assessment of local and institutionally established practices – as Habermas proposes it should –, also requires "a particular vision of social emancipation or the 'good society' (Cooke 2004)" (p. 125). Roughly: a historically progressive deliberative democracy founded upon a universalistic conception of communicative (as opposed to strategic) reason. A relativistic contextualism, or so the reader may understand, constitutes the "theoretical threat" (p. 127) to Habermas's project. More precisely, and with a view to part III: According to Rehg, there remains in Habermas's approach a "tension between the ideal[alized justifiability of claims before the univer-

sal audience] and the real [institutional constraints on discourses of truth and justice which] creates the problem of contextualization" (p. 124).

In chapter 5, *Habermas's Theory of Argumentation as an Integrated Model of Cogency*, Rehg seeks to develop Habermas's theory as a comprehensive framework

> to see how his theory plausibly integrates, within a normative theory of cogency, (a) a logical perspective focused on argument content, (b) dialectical and rhetorical perspectives that analyze the substantive normative commitments, *ethos*, and psychology of science as a discourse community, and (c) social-institutional perspectives that acknowledge the strategic aspects of argumentation without negating the possibility of normatively good reasons. (p. 131)

Rehg argues that Habermas's rhetorical level, at which argumentation is construed "as a process of communication in which arguers seek to gain assent of an audience according to the standard of the universal audience" (p. 135), cannot properly qualify as rhetorical. According to Rehg, the presuppositions of reasonableness identified by Habermas – "exclusion of coercion or force (…), openness of the argumentative process (…), equality of participation (…), and non deceptiveness" (*ibid.*) – should rather be considered "process idealizations" (p. 136). "[L]ike the ideas of truth and universal consensus (…) [, they constitute] idealizations that are at once counterfactual and pragmatically efficacious (…)" (*ibid.*). Thus, "Habermas's ideal process standards (…) have a dialectical function, and so we might wonder if their alignment with rhetoric is apt" (*ibid.*), for "(…) his understanding of rhetoric remains very much a *logos*-centred model or, more precisely, a dialectically oriented rhetoric" (p. 137).

> Thus, the two levels that Habermas distinguishes [dialectical and rhetorical] coincide insofar as both set down rules for organizing the process of critically testing arguments. They differ mainly in the object of the rules – statements versus participants – but in fact a critical discussion requires both types of rules. (p. 138)

Collapsing Habermas's rhetoric into dialectic opens up a space which

Rehg wishes to fill with considerations based on Aristotle's analysis of *ethos* and *pathos*, to reach "a more substantive and contextualist rhetorical perspective" (*ibid.*). With respect to argumentation in science, Rehg identifies two uses of *ethos* and *pathos*. On the one hand, he mentions Aristotle's "proof from character" (p. 142), by which a speaker seeks to establish herself as a competent interlocutor (in the process of argumentation, rather than by reputation) and "gives the hearer evidence of one's capacity to judge plausibilities responsibly" (p. *ibid.*). On the other, "scientists use (the device of) *pathos* insofar as rational argumentation always involves 'hot' cognition – not simply a detached logical calculation but a human interest, say, in more elegant theories, surprising counterintuitive discoveries and the like" (p. 143). Importantly,

> (…) this model implies that an individual cannot adequately grasp the cogency of an argument without engaging in a sufficiently high-quality discourse with others, in which participants present their arguments in *rhetorically responsible* ways that enhance the judgement of plausibilities. (…) The individual scientist depends on others, not simply to assemble all the relevant considerations, but to make a responsible *judgement* of their import for argumentative cogency (p. 144, *italics added*).

In the following, Rehg's basic idea is to postulate an internal dependency relation between the logical, the dialectical and the rhetorical, to the effect that – unlike Hempel's or Achinstein's model (see chapter 1 and postscript) which build on impersonal truth – "the merits that qualify arguments as cogent ought to be defined in terms of *pragmatically manifest* features of argumentation (see Johnson 2000)" (p. 147), yielding a "multidimensional model of cogency" (p. 151). Compared to Habermas's theory, the question shifts "from a metaphysical to a pragmatic register, understanding cogency in terms of the pragmatics of assessment rather than abstract statements of impersonal truth conditions and logical connections" (p. 151).

Rehg defends this shift against an objection, according to which "the 'lone genius' can reach a *true* conclusion on the basis of arguments the community finds unconvincing" (p. 149) – a situation which Habermas's distinction between truth and justification allows (*ibid.*). Rehg argues, "the lone genius objection appeals to a scenario that depends on hindsight and thus

tacitly assumes the social conception of cogency it targets" (p. 150). For she is not a *lone* genius who managed to communicate the fruitfulness of her claim to others; nor is she considered *a genius* until "other scientist can successfully incorporate her work into their own practices of inquiry" (*ibid.*). The supposition is that "the loner's own argument makes a fruitfulness claim that can be sufficiently supported only when it actually bears up in the broader discipline: only then can her arguments count as the publicly acceptable knowledge on which the objection relies" (p. 150f.).

This brings him to the social institutional level. Unlike the dialogical (he uses the term as: 'rhetorical' plus 'dialectical'; p. 152) level, where only idealizations are found, it "calls for the empirical study of the micro- and macrosocial contexts of argumentative practices in science" (p. 153), identifying, "socioeconomic forces, disciplinary organization, institutional mechanisms (e.g., credit [see below]), personal interests and so on" (*ibid.*). Here,

> the social institutional perspective, as a critical perspective, tests the presumption of sufficient approximation [to the ideal] by scrutinizing both the design and the execution of scientific inquiry/discourse for their dialogical adequacy. (…) If the process is sufficiently dialogical, then greater consensus indicates a more cogent argument. (p. 154).

Importantly, insofar as Habermas includes observable social-institutional conditions of actual discourse about a theory, T, these conditions, *if and as long as they are not violated*, then serve as *warrants* for a presumption that one has satisfied ideal dialogical conditions which, in turn, indicates that T is probably true (see Fig. 5.1, p. 156). But neither the interlocutors nor the analyst can have direct access to cogency. "Rather, we must rely on social-institutional indicators (…) as a defeasible warrant for presuming we have such justification" (*ibid.*).

As Rehg notes, Habermas's conception does not only assign SSK the odd role of explaining bad science through the identification and evaluation of social-institutional indicators – and, therefore, is hardly able to fill Kuhn's Gap (*ibid.*) (see chapter 2). Habermas's conception is also at odds with the demand of a pragmatic manifestation of cogency. Consequently, Rehg seeks to recover the dialogical ideals in the here and now. To show this is possible, he considers credit (for an invention or a discovery), noting that its attribu-

tion "requires a certain amount of secrecy in science communication, thus (…) [temporally] undermining the openness required by the ideal of inclusiveness" (p. 158).

What looks like a trivial example "serves to specify the openness/inclusiveness *ideal* by situating its operation in a temporal framework" (p. 159, *italics added*). The deviation from the ideal of openness is explained by social mechanisms (self interest, need for recognition) which, in the long run, sustain social order in science. Thereby, Rehg brings cogency "down to institutional earth" (*ibid.*). To be more fully developed in part III of his book, and *vis á vis* Habermas's negative criteria for cogent arguments, the reader has been allowed to glimpse at a *positive* form of context-sensitive reason.

In chapter 6, *Argumentation at Fermilab: Putting the Habermasian model to work*, in order to clarify and test Habermas's model (p. 164), Rehg draws on a 1993-1994 research and publication process in high energy physics at Fermilab, as described by Staley (2004). The case study centres on different methods for detecting the *top quark* in high energy collisions between subatomic particles. These methods are statistical; results are based on an interpretation of instrument readings (rather than, e.g., cloud-chamber images); the instruments register (extremely rare) events believed to indicate the presence of the sought-for particle, along with background noise. Rehg details the research group's methods, the process of writing (via an internal critical peer review process) what is referred to as the 'Evidence paper'. He then analyzes the group internal debate and subsequent compromise/consensus on whether the data warrant "a discovery claim, a weaker evidence claim, or no interesting claim at all" (p. 170).

> To the extend that this rather upbeat interpretation of the writing process is accurate, the Evidence paper has an irreducibly social character in the sense that (a) each author freely shares in the collective acceptance of the paper's argument in its entirety [read: consensus], but in such a way that (b) no single author has complete command over the various considerations and evaluations that entered into the construction of the argument. (…) Such an argument genuinely expresses an 'intellectual solidarity' – an enterprise to which individuals organically contribute somewhat different, but complementary, skills and perspectives in producing a result in which all share freely (p. 183f.)

Rehg can attest an irreducibly social character to the Evidence paper insofar as its claim was oriented towards a consensus among group members and was raised after excluding from the group an outside researcher – along with his position, allegedly reached by jumping to the conclusion – "partly because of concerns over merit, and partly in view of the outsider's alleged lack of judgement" (p. 177) or *ethos*.

The meat of the case lies in the significance of the 'no peeking (predesignation) rule', a dialectical rule which – for reasons of bias towards obtaining a *desired* result – obliges the researcher not to look at data before "the selection of cuts" (p. 175), i.e., scale points beyond which an instrument's reading is regarded to indicate data *rather than* background noise (see p. 173). From the logical perspective, Rehg reconstructs the group's argument concerning "the adequacy of the testing methods" (*ibid.*) as a "relatively straightforward statistical argument (…): one must falsify the null hypothesis [H_0]" (p. 168). H_0 says: "'[A] particular data sample has been drawn from a population of proton-antiproton collision events that is free of top-quark production' (Staley 2002, 285)" (*ibid.*).

Should falsification of H_0 be achieved, then this occurs relative to a cut-value of, say, x (see p. 175 for details), such that – given a (mathematical) null probability distribution – "the probability of observing seven or more candidate events [as in fact happened] *in a sample free of top quark production* is 0.041" (p. 175, *italics added*), i.e., very low, given that, in the same sample, only "3.1 +/- 0.3 candidate events" (*ibid.*) are expectable. On a naïve view, this "result" will be interpreted as confirming the negation of H_0. Now, "[t]he central objection grew from the suspicion of bias in the [group's] choice of cuts – that they had 'tuned on the signal'" (p. 173), as the (same) group had considered a value of $2x$ one year ago (*ibid.*). Thus, generally, "the statistical significance of the data cannot be assessed as they stand. Conversely, assessing such statistical arguments *inherently* depends on knowledge of the procedures used to produce it" (p. 176). Rehg holds, this reservation is distinct from considerations concerning the *reliability* of instruments.

> The no peeking rule directly governs the experimenter's *psychological* states – what one is allowed to know and when. This makes sense inasmuch as the rule aims to exclude an objection that targets the

> experimenter's psychology, namely the charge of unconscious bias. From the perspective of Habermas's process ideals, bias represents a form of internal coercion. Thus the predesignation rule links the process ideal of uncoerced discourse directly with the content of evidential argument. One would expect such a link in the human and social sciences [!]. The (…) debate shows how important it can be in the natural sciences as well, *indeed to the point of making the logical cogency of a mathematical (statistical) argument inherently depend on procedural fidelity.* (p. 176, *italics added*)

The group's Evidence paper stuck to the lower cut-value (x), presented the data, but *avoided* the claim that evidence supports a falsification of the H_0 hypothesis (p. 179) (Following a second test run, the discovery claim was subsequently raised in another paper). With a view to Habermas's theory and its strong sense of consensus, Rehg observes, "the group did not converge on its consensus position on the basis of the same reasons, as Habermas's model requires" (p. 180), although "scientists oriented themselves toward the central dialectical standard: that cogent arguments should stand up to critical challenges in open debate" (p. 182).

Importantly, a report on this group-internal disagreement is *absent* from the Evidence paper. Therefore, despite any perceived dialectical adequacy of the process *for the insider* – constituting a warranted presumption of dialogical adequacy (see table 6.1, p. 188) –, hiding the disagreement makes it impossible for an outsider, e.g., the public, to evaluate (without additional information) "whether the level of consensus *tracks* the merits of the argument" (p. 187, *italics added*). After all, the consensus might be based on political pressure or be motivated by the sake of communicating a clear conclusion. A question, "modestly addressed to the paper authors" (p. 188) arises: "[I]n signing on to the [Evidence] paper without notice of the unresolved disagreements, have you misrepresented the merits of your argument?" (p. ibid.). At the same time, Rehg is careful to note the risk of open disagreement: "[S]pecial interests can find it politically useful to overemphasize disagreement in the science community for purposes of blocking policies and laws unfavourable to their agenda" (p. 189). Nevertheless, he claims that Habermas's model especially implicates (abrupt behaviour change in) science journalism which, to date, is not known for "digging into

the depth and dialogical quality of the positions reported in popular science venues" (*ibid.*).

Unlike the case of credit (see chapter 5) which was analysed as a *long-run* fruitful, therefore an epistemically justified temporary suspension of openness for the sake of sustaining social order, "the conflict between compromise and noncoersion is less easily reconciled with Habermas's model, particularly so in *short-run* contexts in which non-scientists [e.g., policy makers, the public] must rely on expert opinion for making practical decisions" (p. 191). Thus – here SSK methods, along with, e.g., considerations of collective judgement aggregation (*ibid.*) come in –, it is an *empirical* question if "untainted consensus actually exists" (p. 192), and another "to what extent (…) coercive social procedures drive the compromise" (*ibid.*). According to Rehg, giving an answer requires evaluating the potential of interdisciplinary cooperation between a Habermasian and SSK theorists, particularly those committed to relativism (to form *Critical Science Studies*, see below). In the limit of such cooperation: Although

> [o]ne might go considerable distance with SSK in this critical project (…) [in a way which] opens *all* consensus positions to sociological investigation. In the end, however, critics must still distinguish arguments on the basis of merits partly defined by counterfactual idealizations. (…) [W]e must still ask whether actual processes of inquiry and discourse warrant the presumption that compromises and social pressures, though present, have not seriously undermined the dialogical merits of a given outcome (…) (p. 192, *italics added*).

In the postscript to the second part, *Who's Afraid of SSK. The Problem and Possibilities of Interdisciplinary Cooperation*, SSK theorists "like Barnes and Bloor [are said to] insist on a kind of scepticism towards rational justification, or what I call 'justificational atheism'. This view puts the Strong Program [in SSK] directly at odds with Habermas" (p. 196) whose theory is said to

> commit us to the regulative idea of an intrinsically reasonable dialogue: a hypothetically reasonable dialogue untainted by any motive or influence that would detract from the reasonable construction and evaluation of arguments on their merits (relative to the available epistemic resources). (p. 197f)

It is this "rationalist commitment" (p. 198), Rehg explains, which grounds the distinction between collective outcomes (openly or insider non-)perceivable as dialogically adequate which (do not) track the merits of the arguments, in turn yielding one (or no) position as decisively superior (see. p. 188). Though allowing for ties, this commitment is said to "recall" the internal/external, epistemic/social asymmetry which SSK theorists denies when rejecting "that [over and above a merely *perceived* version, operative in science,] arguments could ever *have* an intrinsic force of their own, a force that could be distinguished from social context" (*ibid.*, *italics added*). On behalf of atheism, and by extension perhaps on behalf of compromises more generally, Rehg notes:

> [I]n saying that social conditions are 'ultimately decisive', atheists need not claim these are the sole determinant of outcomes or that science is unconstrained by nature. Rather, the phrase gains its sense from a context of explanation in which one wants to understand how, given the underdetermination of theories by evidence, scientist reach their conclusions. (p. 199)

Faced with *prima facie* incompatible conditions for cooperation, Rehg calls for "a lateral move, adopting the epistemological equivalent of John Rawls method of avoidance (Rawls 1996)" (*ibid.*). Practically speaking: Recognize differences, study cases (see p. 208). And do it such "that an SSK study of a given case can proceed without invoking a sweeping atheism and (…) that critical appraisal can appeal to less ambitious standards than the idealizations articulated by Habermas and others" (p. 200).

The terms on which critical science studies (CSS) may operate leaves the designation 'scientific vs. unscientific' "to the participants themselves" (p. 203), likewise for categories such as '(ir)relevant motive' or 'unchallenged presumption' (p. 201). Rather than define (un)scientificity in an *a priori* manner (p. 203), "we must state these factors [which a critical analysis identified] as explicit reasons for the consensus and then ask ourselves if our confidence in the consensus is thereby undermined" (p. 202), given the understanding of the aims of scientific inquiry – which is also left to the participants (*ibid.*). E.g., empirical success must not be the primary aim of

science. As it were, consensus situations that do not, upon reflection, *undermine* their own collective results deserve the presumption to approximate the ideal process – only such talk is avoided now.

Denying any claim to exhaustiveness, Rehg identifies three forms of critique which CSS may deliver when studying scientific discourse: criticism of background assumptions as empirically false (contrasting one science with another), exposing ideological commitments (as steering a research program), acknowledgement of the social and political agendas that shape science and its social implementation (p. 208). All are forms of "making presuppositions and influencing conditions explicit for purposes of critically assessing particular scientific arguments that have gained some level of acceptance among a group of scientists" (p. 203). If "the analysis is successful – (…) participants accept its results as conclusive or plausible enough to stimulate critical reflection on the science at issue" (p. 207).

A case in point is provided by a scenario involving two mutually incompatible models (or theories) both plausibly, but inconclusively supported by argument, and – as reasons for a consensus with respect to either model – also related to the social consequence of the respective model (p. 204). Imagine such a consequence pertains to what in Rehg's example is the "sociopolitical interest in the maintenance of traditional gender roles" (*ibid.*). Model 1, say, supports these interests, while model 2 rather supports emancipatory interests. Now, whoever construes her consensus position with respect to any of these model as a claim to "theoretical superiority" (p. 205) – i.e., a claim of being "worthier than [the other model] of our pursuit and provisional acceptance as theoretically more fruitful, that is, as the more accurate representation of nature" (p. 205) –, would be open to a dialectical critique. On this critique, which "targets a background assumption or social factor as unscientific" (*ibid.*), the second of the above factors (emancipatory interest) "is irrelevant as an explicit supporting reason and should undermine our confidence in the consensus" (*ibid.*). Note that the critique can be simply avoided by construing: 'Compared to the other model, ours is worthier etc. as socio-politically more fruitful (and as possibly the more accurate representation)' (*ibid.*).

This, Rehg submits, may make sense only as long as both sides share a conception of evidence and subscribe to a theory's principled underdeter-

mination by evidence. Here, evolutionary biologist and creationist/intelligent design theorist serve as examples of groups that "diverge too sharply for them to consider the other side's position as reasonable" (p. 206).

> SSK analyses, as I have presented them here, depend crucially on showing that the evidence for some scientific conclusion is not conclusive. Precisely this inconclusiveness opens the door to sociological factors. If this opening move is itself disputable in a given case, then a plausible argument can be made that the evidence for a consensus in science is indeed conclusive. Thus, the attempt to apply the dialectical critique to itself will in many cases boil down to a dispute over the status of the evidence for the primary scientific conclusion at issue – the kind of deep controversy exemplified in the creationist debate. (p. 207)

In preparation for part III, Rehg closed by noting the metaphysical status of Habermas's idealizations. To him, it appears as an unnecessary limitation in interdisciplinary potential, and is ascribed to the Habermasian *manner* of integrating the logical, the dialectical and the rhetorical perspectives" in a *philosophical* theory of cogency (p. 208).

> [T]he critical theorist must relax the general philosophical claims about the ideal grounds of cogency and rely instead on participant's *judgements* – what scientist perceive as cogent in the specific contest at issue. In this move one can see the first hints of a critical contextualism that radically repositions the framework of critical assessment. (p. 209, *italics added*)

Part III, *Toward a Critical Contextualist Framework for Interdiscipinary Assessment*, starts with chapter 7, *Adjusting the Pragmatic Turn: Lessons from Ethnomethodology*, which advertises no less than "a revised understanding of truth, objectivity, and dialogical idealizations" (p. 224). This shall result from "incorporating the radical challenge [posed by ethnomethodological accounts of scientific work by treating] "ideas of reasons [e.g., truth, objectivity] (…) [by their] function as modes of mutual accountability" (*ibid.*) and "dialogical ideals [e.g., inclusiveness] as rhetorical potentials" (p. 227).

The radical challenge to the "grand theory" (p. 223), i.e., Habermas's

formal pragmatics, stems from the deflationary research policy observed in ethnomethodology. According to it, "one's own ideas of rationality are set aside in order to attend more closely to the situated 'methods' or 'procedures' that members themselves used to produce social order" (p. 222). One is asked to "resists 'all efforts to build general models and to develop normative standards that hold across situations' (Lynch 1993, 306)" (p. 223) and to subscribe to the irremediable "indexicality of language" (p. 219), according to which "all language – and all meaningful behaviour – acquires a definite sense only in the concrete situation" (*ibid*).

> Applying this point to argumentation, we should say that its rationality lies in the practical, local achievement of cogent arguments. Formulated rules of argument and idealizations such as Habermas's pragmatic presuppositions are glosses, shorthands that acquire their intelligibility and relevance only in relation to the situated rationalities, the practical know-how of local practices. Competent arguers must *discover* each time the concrete methods, the situated rhetorics, by which they can argue reasonably. Consequently, one cannot simply invoke formal structures or idealizations to account for the rationality of argumentation. (p. 223, *italics added*)

The "dilemma" (*ibid.*) created by not allowing simple invocation consists in the *prima facie* necessity of these formal structures for an *external* mode of criticism in Habermas's "project of emancipatory critique" (*ibid.*). However, treating process idealizations (e.g., objectivity or inclusiveness) indexically (or: locally) yields the verdict that "as abstract ideals, they do not enjoy presumptive applicability to practice; rather their proponents must meet domain- and locale specific burdens of proof" (p. 230). As an alternative to the principled indifference which an ethnomethodologist might advertise at this point (p. 230), Rehg recommends that critical science studies adopt "the engaged attitude of the participants" (*ibid.*) and in "formulating indexically sensitive idealizations that participants find relevant in their situated accounting procedures (…) avoid a disconnected top down-approach" (p. 231) in favor of an *indirect* mode of engagement.

> Like ethnomethodologists, critical (argumentation) theorist strive to notice such situated details; like scientists, however, they take the stand-

> point of participants who are interested in the correct assessment of potentially controversial scientific arguments. This does not mean that critical theorists must (…) engage directly in this or that controversy. (…) [T]here is also an *indirect* or "vicarious" mode of engagement (…)[,]evident in those controversies in which participants [scientists] explicitly invoke argumentative ideals as part of their advocacy (…), particularly in interdisciplinary controversies (…). Argumentation theorists are *indirectly* involved in these debates insofar as directly engaged participants draw upon formulated ideals of argumentation. (p. 230f., *italics added*)

Thus, rather than first requiring expert status in a particular field, critical theorists can connect to context-transcendent ideals invoked by participants (most notably: 'truth', p. 227) which, in various ways – "through contact with philosophy of science, from science textbooks, works by public intellectuals" (p. 231) – , have disseminated from the critical theorists' field to that of the directly engaged scientist. On such an understanding, "a scientific truth claim assumes, not so much the counterfactual assent of an ideal audience, but rather the potential relevance and contextualizability of that claim in an *indefinite* range of scientific and extrascientific contexts" (p. 227, *italics added*), especially those pertaining to the "science-society interface" (p. 236) which "link technical choices with nonepistemic social values" (p. 235). However, " theorists meet the more radical contextualist challenge only when they recognize formulations as *no more* than potential accounting procedures (…)" (p. 231, *italics added*). Insofar as these formulations refer to process idealizations, e.g., "inclusiveness, equality, non coercion" (p. 229), Rehg claims, these terms are not applicable "to some ideal universal audience, but always to specific features of an institutional arrangement in some particular domain or locale" (*ibid.*).

> To render process idealizations more context sensitive, then, I suggest we view them as enduring sites of contest and reflection in social life – potential questions or rhetorical *topoi* that in principle remain open to context and thus can never be regarded by practitioners as finally settled. (…) Thus, to refer to process idealizations as rhetorical *topoi* does not so much deny their status as pragmatic presuppositions as specify it. (p. 229f.)

According to Rehg, the following four modes of criticism become possible: (i) a mode of either external or immanent criticism "drawing on sociological analysis to make explicit the political values that drive competing research agenda" (p. 232), e.g., a feminist critique of masculine bias in science; (ii) an immanent mode which "attempts dialectically to undermine or refute simplistic ideals of scientific method" (*ibid.*) targeting, e.g., "the positivist ideals of method" (p. 233), (iii) an ironic variant of the second mode aiming "to elicit justification [from participants] that elaborates the situated rationalities and local discretionary judgements that the [participant's] justification did not at first attend to" (p. 233), and, lastly, (iv) an external mode of criticism which remains compatible with the ethnomethodologist's indifference "[b]y choosing to study a group whose practices are assigned a marginal status by the dominant culture" (*ibid.*) and recognizing "possible alternative rationalities" (*ibid.*).

Furthermore, Rehg claims that his "critical contextualism supports a deliberative democratic model of science-intensive policy formation, for deliberative democratic procedures are designed for just such cross-contextual argumentation and dialogue" (p. 236). While "standards of cogency differ across different disciplines and social contexts" (p. 237) – and this claim *embraces* the relativism Habermas's criticized, e.g., in Toulmin's conventionalist notion of field dependent standards of validity –, a principled incommensurability does not appear to follow necessarily: "[W]hether two given contexts operate with commensurable or incommensurable standards is a matter that must itself be judged from a third context (Kusch 2002, 245-246, 277-279)" (*ibid.*). In adjusting the pragmatic turn *away from* a metaphysically absolutist notion of truth, and with reference to Hales's (1997) modal logic of relativism, a "consistent relativism" (p. 237) is advertised, according to which

> the thesis that everything true (or untrue) is true (or untrue) relative to some context or perspective is not self-contradictory – unlike the simplistic relativist thesis that 'everything is relative'. (…) But it [the relativism] remains compatible with a different sort of absolutism, namely the idea that at least some, and possible all, true statements are true in every perspective or context. This formal analysis thus allows the kind of cross-contextual moves and ideas of truth for which I have argued. (*ibid.*)

In chapter 8, *Three Dimensions of Argument Cogency – A Contextualist Case Study*, Rehg draws on a detailed case study, located at the boundary of science and society, on "a series of expert panels appointed by the National Academy of Sciences (NAS) in 1980, 1982 and 1985 to study the possible links between diet and health" (p. 242). Conducted by Hilgartner (2000) who draws on Goffman's (1959) dramaturgical sociology, the case study uses concepts such as "front and back regions [of a metaphorical stage], impression management, and information control" (p. 234). Here, "[t]he key to understanding the different fates of these [three] studies lies in the panel's success at impression management, which in turn depended partly on the institutional networks of expertise they could enlist in their support" (p. 244).

To reach his three dimensions of argument cogency with a model claimed to be similar to that of Wenzel and Habermas (p. 266), Rehg draws on the distinction between micro and macro process (p. 245), such that argumentation theory studies conversational transactions at the micro (or turn-taking) level, often with a particular audience in mind, while "public sphere theorist have studied argumentation as a broadly dispersed public process (…) often focussing on institutional structures that affect the quality of public debate" (p. 246).

> These observations suggest we divide the dimension of process according to its local and public contexts. We can then distinguish three interrelated dimensions of argumentation: the *argument* itself (the product), the local *transactions* in which arguers produce and engage arguments, and the *public* networks and arenas through which arguments spread and reach a large number of people. (p. 246)

Rehg can support this distinction by pointing out that, in the 1982 NAS study, both an "empiricist rhetoric" and an "expert-judgement" rhetoric are at work. The earlier "focus[es] the reader's attention entirely on the *content of the argument product*" while the latter "tacitly relies on claims about the quality of the *transactional process* through which the [NAS] committee produced its arguments" (p. 248). Unlike the 1982 version, however, in light of shortcomings with respect to transactional quality, the 1980 and the 1985 documents "failed as attempts at *public* argument" (*ibid.*), i.e., failed as argumentation that may be considered *cogent in the public context*.

> [P]articipants can evaluate the strength or cogency of an expert argument according to (a) the argument's content, (b) the quality of the transaction that produced the argument, and (c) the ability of the argument to appeal to a wider reasonable public that finds it relevant, thought provoking, or convincing [the latter being glossed as the argument's ability to "travel"]. (p. 250)

Crucially, while the NAS expert panel may be described as local, the issue discussed (the connection between diet and health) is of public interest. Coining a new term, "[a]rguments that win broad acceptance *across* a well-structured social space of multiple local (and reasonable) transactions enjoy (…) 'public merits'" (p. 251, *italics added*). Such enjoyment presupposes that "people in different transactional locales and domains can engage the argument and accept it" (*ibid.*). Importantly, should the social space be well structured to begin with, then "the ascription of public merits is (a) independent of the merits we can identify in the argument itself on the basis of logical and topical standards and (b) differs from the transactional merits we can attribute to the argument as persuasive in this or that particular locale (…) " (p. 252).

Content merits, transactional merits and public merits, then, are construed as differentially important according to "the locally situated occasion of the argument" (p. 253). The NAS study provides evidence for these claims, amongst others insofar as, *locally*, exclusionary tendencies among the NAS panel may be said to have sustained social order, while, *publically*, the very same tendencies have provided reasons to doubt the interactional quality of the NAS arguments and thus its recommendations.

Generally, which of the three merits is most important, is a matter of context; "[n]or does the model require every argument to have all three sorts of merit – that too is a context-sensitive matter" (p. 266). "I also leave open the possibility that for some evaluative purposes it may suffice to examine only one type of merit, even if we could in principle assess the argument more comprehensively" (*ibid.*). Rehg hesitates to attempt an integration of the three dimensions, seeing neither a need nor a possibility, but treats them as a heuristic (p. 267).

> Rather than start with an integrated prescriptive definition of cogency,

> the critic must *delve* into the particular case and first become familiar with the normative concerns of the participants themselves and how they attempt to integrate those concerns. (…) In making such critical assessments, argumentation theorists enter the fray at the same level as critical participants: the contextualist framework does not bestow privileged status on those who adopt it. (p. 267f.)

Thus, the critic, as Rehg writes, "must find a basis for taking a justified stand on a particular interpretation of merits, or on the cross-contextual relevance or certain transactional standards, and so on" (p. 268). In the full sense, then, the critic has become part of the action. She can no longer invoke ideals and be done justifying them. "But neither does she have to accept whatever it is that the participants happen to believe about cogency" (*ibid.*). Rather, her critique must prove its reasonability in the concrete case. Though some normative demands might be "'absolutes' in the sense of holding in every context, or at least every context at issue" (*ibid*), it remains true that "the real challenge for critique arises when standards are contested, either in their relevance or in proper interpretation (…)" (*ibid.*). Lacking a basis from which to take a justified stance for one's critique, the question of the good society arises, specifically: "a vision of science in society" (*ibid.*).

The final chapter 9, *Critical Science Studies and the Good Society*, starts with a recapitulation of Rehg's approach in the face of "challenges connected with post-Kuhnian science studies" (p. 269) and a description of his approach to "scientific inquiry as a socially embodied constellation of *argumentative* practices" (*ibid.*). The challenge and motivation for his book are stated to consist in finding "a comprehensive concept of cogency that can integrate the prescriptive perspectives favored by philosophers and the descriptive perspectives of the social sciences" (p. 270), to yield a "framework for fruitful interdisciplinary exchange" (*ibid.*), to which Rehg holds critical science studies (CSS) "deeply committed" (p. 275).

> The key move involves a shift from the traditional evaluative perspectives (logical, dialectical, rhetorical) to a context-oriented framework [content, transactional, and public merits]. Rather than start with the ideal that a cogent argument must satisfy a specific set of logical, dialectical, and rhetorical standards, I subordinate the traditional perspectives to

> the different levels of context that condition the meaning and relevance of the standards those perspectives highlight. (…) One thus understands ideals substantively, in the rhetorical, context-specific sense, from case to case. Similarly, the idea of a single objective world, along with the specific pragmatic commitments entailed by making truth claims about that world, also acquires an indexical component (…). (p. 271)

Free of certain ideals, critical contextualism starts and ends in contexts. Of these, the most important with respect to grounding critique seems to remain that of discussing "the direction science and technology ought to take in today's society" (p. 276). In fact, the relation between science and society appears as the ultimate evaluative context. Though rather unwilling – "[i]f one must put the critical contextualist approach into single integrated statement" (p. 277) –, Rehg offers the following "procedural statement" as a methodological recipe:

> *Cog (A): To assess the cogency of argument A*,
> (1) *start with the context of origin* C_O: assess the content, transactional, and public merits of *A* as it is interpreted in C_O, according to (a) the logical, dialectical and rhetorical standards relevant in C_O, and (b) the goals of scientific argument in C_O;
>
> (2) *evaluate the broader public merits of A*: ask whether there are further relevant contexts C_R for assessing the cogency of *A* (e.g., related scientific disciplines, technological and medical contexts, interested lay publics); if there are, then assess *A* according to the standards and goals relevant in C_R;
>
> (3) *situate the critique, and settle conflicts between (1) and (2)*: ask whether the relation between science and society, or the goals and problems currently relevant for science in society, call for an assessment of *A* from the standpoint of further evaluative context C_E. If the answer is yes, then assess *A* in relation to standards relevant in C_E.

This recipe is obviously oriented not so much to "interdisciplinary controversies within the sciences in which all parties are geared towards empirical truth" (p. 287), but rather to "policy-relevant scientific arguments [which] move across fundamentally distinct cognitive domains" (*ibid.*) As

Rehg stresses, it is not at all clear that "contextualist democratic inclusion" (*ibid.*) of the public can or should settle the matter. If there is a "final arbiter" (p. 289), then it comes about by "inclusion of all the relevant contexts, scientific and lay" (*ibid.*). This is the maximum of prescription Rehg seems willing to admit. Also therefore, we would do well "to expect (…) case-specific complexities" (*ibid.*).

On the final pages, complexities are addressed in terms of the relevance of arguments for contexts (rather than the other way around) and the transformation of arguments in "travelling" from one context to another. While these, as well as the larger controversies over standards, such as that between evolutionary biology and creationism, seem to pose challenges for contextualism, Rehg is "not sure that the metacritical framework settles these deeper questions" (p. 290). And yet, as the last paragraph states:

> If that analysis is on target, critical assessment finds its grounds in a vision of the good society and its relation to scientific knowledge. As a meta-critical framework, contextualist CSS does not fully specify a single vision of the good society. Pushed to this deeper level, reasonable critique must argue for one vision over its competitors. The analysis of such argumentation takes us beyond the present work (but see Cooke 2006), though I suspect that effective arguments depend on innovative transformations of practices and social institutional experimentation in which members acquire direct experience of alternative visions. In any case, a vision of the good society constitutes the final, encompassing context of evaluation in which all other contexts presumably emerge and find their place.

3. Evaluation

Rehg's book is a substantive achievement, drawing on a very wide range of relevant literature from various disciplines (The reference list is 22 pages long; at entry # 102, we reach the letter F). Most importantly, Rehg manages to establish critical contextualism as a live option for future interdisciplinary research *vis-à-vis* current approaches, notably (relativistic) sociology of scientific knowledge and Habermas's discourse theory. In my opinion, he rightfully accuses both for incurring one or the other dogma which

hinders interdisciplinary cooperation. In contrast, critical contextualism appears able to fruitfully address and inform fields dealing with questions traditionally located in philosophy of science and political science.

The strength of his book lies in Rehg's mastery of the subject and the clear presentation of argumentative merit (content, transactional, and public) by means of rich examples. Rehg shows us that rather insurmountable difficulties arise in applying the current state of the art. If there is a single message in the book, then it might be put as follows: 'The devil is the details and which detail matters is primarily a question of context. So, stop waving your hands above participants' heads and, instead, engage with the material.'

A second strength lies in what the author manages to avoid, both substantially and exposition wise. A topic such as his is prone to drown in technical detail, rhetorical over-effort or meaningless philosophical dispute. Rehg stays clear of these traps, instead providing a comprehensive overview of the contexts and contributions constituting his issue. Substantially, on the other hand, his contextualism is conceived strong enough to render a critical analysis of socially relevant scientific argumentation possible, yet weak enough to not preclude its result in favour of a material standpoint. Thus, his critical contextualism successfully avoids constituting a moral theory in disguise.

It may be debated, if Rehg manages to *integrate* (in the literal sense of the word) the rhetorical, the dialectical and the logical perspective. In fact, I am neither sure that he fully intended to do so, nor that he did not. Perhaps, not so much hinges on integration, but one may suspect the issue will be taken up by critics. What we likely will not see, are complaints regarding the self-applicability of Rehg's ideas – the critic's favourite move. With a single exception (see the longer quote from the second postscript, p. 207), considerations of self-applicability do *not* play an explicit methodological role in Rehg's work. Given what he *does*, however, one may assume that securing self-applicability is important to Rehg and that he has successfully minded this constraint.

Works Cited

Achinstein, P. *The Book of Evidence.* Oxford: Oxford University Press, 2001.
Cooke, M. *Re-Presenting the Good Society*. Cambridge, Mass.: MIT Press, 2006.

Goffman, E. *The Presentation of Self in Everyday Life*. Garden City, N.Y.: Anchor-Doubleday, 1959.
Hales, S.D. "A consistent relativism." *Mind* 106 (1997): 33-52.
Habermas, J. *Truth and Justification*. Trans. B. Fultner. Cambridge: Cambridge University Press, 2003.
Hilgartner, S. *Science on Stage*. Stanford: Stanford University Press, 2000.
Johnson, R.H. *Manifest Rationality. A Pragmatic Theory of Argument,* Mahwah, N.Y.: Erlbaum, 2000.
Kusch, M. *Knowledge by Agreement*. Oxford: Clarendon Press, 2002.
Latour, B. *The Pasteurization of France*. Trans. A. Sheridan and J. Law. Cambridge: Harvard University Press, 1988.
Lynch, M. *Scientific Practice and Ordinary Action*. Cambridge: Cambridge University Press, 1993.
McCarthy, Thomas. *Critical Theory*, chaps. 1-3, 7. Other chapters by David Hoy. Oxford: Blackwell, 1994.
O' Keefe, D. "The concepts of argument and arguing." In Cox, J. R. & C. A. Willard (eds.) *Advances in argumentation theory and research* (pp.: 3-23), Carbondale: Southern Illinois University Press.
Prelli, L. *A Rhetoric of Science*. Columbia: University of South Carolina Press, 1989.
Pollner, M. "Mundane Reasoning." In: Coulter, J. (ed.). *Ethnomethodological Sociology*. Brookfield, Vermont: Elgar, 1990.
Rawls, J. *Political Liberalism*. New York: Columbia University Press, 1996.
Staley, K.W. "What experiment did we just do? Counterfactual error statistics and uncertainties about the reference class." *Philosophy of Science* 69 (2002): 279-299.
Staley, K.W. *The Evidence for the Top Quark*. Cambridge: Cambridge University Press, 2004.
Taylor, C.A. *Defining Science*. Madison: University of Wisconsin Press, 1996.
Walton, D. N. *Informal Logic: A Handbook for Critical Argumentation,* New York: Cambridge University Press, 1989.
Walton, D. N. Relevance in Argumentation, Mahwah, NJ: Lawrence Erlbaum, 2004.
Wenzel, J.W. "The rhetorical perspective on argument." In: Eemeren, F.H. van et al. (eds). *Argumentation: Across the Lines of Disciplines*. Dordrecht: Foris, 1987.
Wenzel, J.W. "Three Perspectives on Argument: Rhetoric, dialectic, logic." In: Trapp, R and J. Schuetz. *Perspectives on Argumentation: Essays in Honor of Wayne Brockried* (pp.: 9-26). Prospect Heights, Ill.: Waveland, 1990.