The authority of the IPCC First Assessment Report and the manufacture of consensus

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1. Introduction

It is widely perceived that "manufactured controversy" has become a serious problem for contemporary civic deliberations. Advocates for special interests have been able to delay, or even derail, much-needed policies by creating an appearance of scientific doubts where there are in fact none. "Denialists" in controversies over policies towards AIDS or towards teaching biology tread a path first laid down by advocates for Big Tobacco, who famously proclaimed "doubt is our product" (Ceccarelli; Michaels; Weinel; Paroske).

In this environment, the work of the Intergovernmental Panel on Climate Change (IPCC) seems a remarkable achievement. Through a series of (up to now) four reports starting in 1990, the IPCC has managed to establish as a political "given" that the earth is warming, and that human activity is a significant cause. The fourth report was the occasion for the Bush II administration's shift from statements like this:

> *We do not know* how much effect natural fluctuations in climate may have had on warming. *We do not know* how much our climate could, or will change in the future. *We do not know* how fast change will occur, or even how some of our actions could impact it.

in 2001, with it's typical assertions of "uncertainty" as a reason for inaction, to statements like this:

> [The IPCC report] reflects the sizeable and robust body of *knowledge* regarding the physical science of climate change, including the finding that the Earth is warming and that human activities have very likely caused most of the warming of the last 50 years.

in 2007. How did the IPCC manage this feat? In opposition to those who would create an appearance of doubt, the IPCC has made evident a broad and deep agreement among scientists—they have "manufactured consensus."

My first goal for this paper is to give an account of the long-term work of rhetorical strategy or design which resulted in the "manufacture of consensus." My second goal is to critique it. Now, it may seem unwise to cast doubt on a strategy that managed against all odds to achieve a result that many of us agree with. Further, it has been proposed that it is just such a scientific consensus—and not unobtainable "proof"—that can provide the basis for sound public policy (Oreskes "Science and Public Policy: What's Proof Got to Do with It?"). Nevertheless, I hope to sketch an account of the IPCC's rhetorical design which suggests that its success came at a price—a price which included contributing to the decades of political controversy over anthropogenic warming which it finally (at least for now) put to rest.

Let me insert the typical but needed caveat here: My discussion is preliminary. I will primarily be analyzing the consensus claims surrounding the IPCC's First Assessment Report (FAR), and

even there, focusing on the presentation of the science of global warming prepared by Working Group I (WGI). I hope more to sketch a plausible hypothesis about the manufacture of consensus than to make a definitive statement, and I look forward to getting it improved by my fellow panelists.

2. "Consensus": whence, what, wherefore and whither

2.1 "Consensus" in the FAR

As far as I can tell, the word "consensus" is absent in the WGI section of the FAR--in particular, it is absent from the initial "Policymakers' Summary" Where it first turns up is in the earliest *representation* of the FAR: a statement defining for public audiences what the FAR is and how it should be taken. John Houghton, the UK's Chief Meteorologist and chair of WGI, wrote the following in his "Foreword" to the report:

> In preparation of the main Assessment most of the active scientists working in the field have been involved. One hundred and seventy scientists from 25 countries have contributed to it, either through participation in the twelve international workshops organised specially for the purpose or through written contributions. A further 200 scientists have been involved in the peer review of the draft report. Although, as in any developing scientific topic, there is a minority of opinions which we have not been able to accommodate, the peer review has helped to ensure a high degree of consensus among authors and reviewers regarding the results presented. Thus the Assessment is an authoritative statement of the views of the international scientific community at this time….I am confident that the Assessment and its Summary will provide the necessary firm scientific foundation for the forthcoming discussions and negotiations on the appropriate strategy for response and action regarding the issue of climate change. It is thus, I believe, a significant step forward in meeting what is potentially the greatest global environmental challenge facing mankind (Houghton, Jenkins and Ephraums v-vi).

Note the explicit claim that the report reflects "a high degree of consensus" among participating scientists, with correlative stress on the smallness of the "minority" that goes against what "most" believe. This claim is expanded by careful attention to who these participating scientists were. They are identified first as "the active scientists"—and furthermore the ones "working in the field" (presumably, of climate science. They are also quantified in three ways: absolutely ("one hundred and seventy," "200"), nationally ("25 countries"), and by their activity ("twelve international workshops")." Finally, the consensus thus characterized is offered as a "firm scientific foundation" for policy-making on an extremely pressing issue—indeed, "potentially the greatest global environmental challenge facing mankind."

What is being done by this complex of features?—this rhetorical form, which I will call a "consensus claim"? One place to begin is by realizing its oddity. After all, we teach our students to recognize and reject *ad populum* or "bandwagon" appeals. I suspect that it would be hard to find scientists claiming *to each other* that such & such ought to be believed, because a "consensus of scientists" thus quantified backed it. In fact, the WGI report itself did not frame its statements "socially," with information about how many scientists of what type and nationality were speaking. Instead, it framed its statements "epistemically," presenting in the Summary for Policymakers what "we are certain of...calculate with confidence...predict" as well as what

"uncertainties" remain, and detailing in a series of chapters some of the evidence backing these claims.

If scientists tend to offer each other epistemic as opposed to social grounds, it is no surprise that there seem to be no mechanisms *within science* for establishing that a scientific consensus exists. That's why outside efforts like Oreskes' elaborate survey of the literature (Oreskes "The Scientific Consensus on Climate Change") are necessary—or like the IPCC's elaborate process (on which, more below).

The consensus claim thus seems to be primarily aimed at *non*-scientists, and in particular (I assert, somewhat speculatively) constitutes an appeal to authority. In this representation of the FAR, audiences are being invited to credit the assessment not because of its epistemic grounding, but because of the social fact of who wrote it. This is not an unusual appeal; as I have documented elsewhere (Goodwin and Honeycutt), epistemic appeals within scientific communities can become transmuted into appeals to authority when they are communicated across the boundary between scientists and citizens. Whereas non-experts almost by definition are unable to assess an expert's reasoning (Collins and Evans), they may be well capable of judging social facts, such as whether some procedures were inclusive. To adapt a phrase of Collins & Pinch, where we might find it impossible to assess scientists on scientific grounds, we can instead assess them on the same everyday, pragmatic grounds we trust plumbers (Collins and Pinch 143; see also Goodwin "Trust in Experts").

The consensus claim, furthermore, appears to be an elaboration of the appeal to authority specifically designed to heighten its force. "Credit what I say, because I say so" is the minimalist version of the appeal to authority. I have argued elsewhere that the force of this appeal is based in a kind of "blackmail": it puts the audience in a position such that they will appear imprudent if they conspicuously go against the view of someone who obviously knows more (Goodwin "Cicero's Authority; Goodwin "Forms of Authority and the Real *Ad Verecundiam*"). The minimalist appeal, however, is relatively easy for audiences to evade. For example, the audience can shop around for a second opinion, and then excuse their non-compliance with the appeal on the grounds that the experts themselves seem to be divided. If, however, *all* the experts say the same thing, the layperson's "plausible excusability" is restricted. In such a case, the experts' statements do seem to constitute the unavoidable "foundation" for policy-making.

To make a consensus claim is thus to do as the Foreword says: to make an "authoritative statement." It's worth noting that there is some evidence that some participants in the IPCC process *aimed* it to achieve just such authority. Bert Bolin, the overall chairman of the IPCC itself, recalls that he "repeatedly pointed out to the working groups that the goal was not necessarily always to reach an agreement, but rather to point out different views when necessary and to clarify the reasons for disagreements when possible." He goes on: "But this was still seldom tried" (Bolin 61-62). In line with this, Houghton himself was quoted as saying (upon the establishment of the IPCC in 1988), "we must arrive at a general consensus" (quoted in Shackley 200).

To summarize: I have attempted to establish the plausibility of the following hypothesis:

1. The rhetorical form I am calling the "consensus claim" involves:
    (a) an assertion, specified as coming from a consensus of scientists, opposed at most by a small minority

(b) identification—and in particular, quantification—of those scientists by their qualities, their fields, their nationalities, and their activities
(c) representation of the scientific results as constituting a foundation for urgent policy-making

2. A consensus claim is an appeal to authority
3. Scientists involved in the IPCC began the association of the FAR with a consensus claim

2.2 Consensus claims in the immediate reception of the FAR

WGI leaked an early version of its assessment in February, 1990 and released the official version to the public in May. The reports from all three working groups were approved and capped with an overall summary by an IPCC plenary in July. And the FAR became a key document in discussions at the Second World Climate Conference in November. News reporting in the general and scientific press from throughout this period consistently shows scientists involved in the IPCC representing the report by deploying a consensus claim. For example, Houghton himself continued his original representations:

> The report by a working group of the United Nations Intergovernmental Panel on Climate Change was approved by all but a handful of the 90 delegates from 39 countries, said Dr. John T. Houghton, chairman. The report said that if nothing at all was done, the global mean temperature could rise 5.4 degrees Fahrenheit by the end of the 21st century. …Mr. Houghton, Britain's chief meteorologist, said that only a handful of the scientists in the panel disagreed with the findings, which he said were dramatic confirmation of how rapidly the carbon dioxide, methane, chlorofluorocarbons and other gases released into the air by industrial processes, the burning of tropical forests and other factors had been changing the earth's atmosphere since the end of the 18th century (*NYT* 5/25/90)

Note the quantification here, the stress on the smallness of the minority, and the emphasis on the "dramatic" urgency of the results. At times, even more quantification could be offered:

> "I was amazed how simple it was to come to agreement," says climatologist Christopher Folland of the U.K. Meteorological Office in Bracknell, who is a lead author of the report's section on observed climate change. "In America, a few extreme viewpoints have taken center stage. There are none like that elsewhere." Not a single panel member or reviewer agreed with Lindzen that there is no sign of global warming in the climate records, says Folland. "That's about 200 people," he notes. The consensus-forming process began with 170 scientists from 25 countries attending 12 workshops or making written contributions. Thirty-four authors wrote up the 11 report sections in groups of two to five, and another 200 scientists reviewed the full draft report. Then there were uncounted informal reviews, some of them by critics, as well as the inevitable unsolicited phone calls from other interested parties. As yet, dissenters contacted by Science had not seen the final working group report. This extensive reviewing and a widely felt need for an authoritative product seems to have weeded out any and all views perceived in the community as scientifically suspect. (*Science*, 8/3/90).

Here we see an additional characterization of the minority of "dissenters" as "a few extreme viewpoints" with possibly "scientifically suspect" views; this is a theme I will return to below. When the "dissenters" began producing public statements of their own, IPCC scientists responded in public not by engaging the scientific issues, but by re-emphasizing the consensus claim:

> Dr Jeff Jenkins, a Meteorological Office scientist and co-ordinator of the IPCC scientific group said yesterday: "This report is just not helpful. A number of things in it are misleading. The report we've issued is an international one, compiled by 170 scientists, the best ones we could find, and we would not expect their conclusions to be second-guessed by a report which is not as close to the scientific consensus as our is." (*The Independent* (London) 6/14/90)

The same set of features prominent in the scientists' discourse was echoed by advocates and editorialists commenting on the work of the IPCC. For example, a Greenpeace spokesperson announcing the report of their own climate assessment emphasized the authority of the IPCC:

> As a scientist, I can say there is a quite unique scientific consensus in the world today. This is a point that may be lost a little bit in Washington, because you have a small number here in the States of very high profile doubters. But in actual fact, next week in Sweden, a panel set up by the United Nations 18 months ago will report, and it will report its findings as being effectively a very bleak future for the world indeed if we keep going with greenhouse gas emissions at the rate we are today. This is the Intergovernmental Panel on Climate Change. It consists of more than 300 of the world's most eminent climate scientists, effectively all the key players in more than 20 countries. And their report is a quite unique consensus (Press Conference, 8/22/90)

Again, we see the consensus claim—emphasized twice as "unique"; the count of scientists and countries (already slightly inflated from that represented in the FAR itself); the marginalization of "a small number…of..doubters"; the "bleak future" which provides an imperative for policy. An editorial in the *Christian Science Monitor* inflates the quantities even more, which establishes an even firmer "basis" for action:

> Wide agreement has emerged among atmospheric scientists that the buildup of heat-trapping gases - including carbon dioxide from burning coal, gas, and oil - is warming the planet.…Over a thousand atmospheric scientists worked 20 months on this assessment. Its unprecedented breadth and depth gives their findings special weight. What adds political relevance is their conclusion that the prospect for global warming and its consequences has a solid enough scientific basis to justify action now to curb the buildup of heat-trapping gases. (9/4/90)

2.3 The ur-consensus claim?

The IPCC's FAR was only one of a half dozen assessments of the science of climate change issued in the 1980s (Hecht and Tirpak). As I will discuss below, most of these contained no consensus claims. The immediate ancestor of the IPCC consensus claim seems to be the statement of the 1985 conference in Villach, Austria, organized by the same intersection between UNEP and WMO that three years later lead to the IPCC (see Agrawala "Context and Early Origins of the Intergovernmental Panel on Climate Change; Franz [Torrance]; Boehmer-

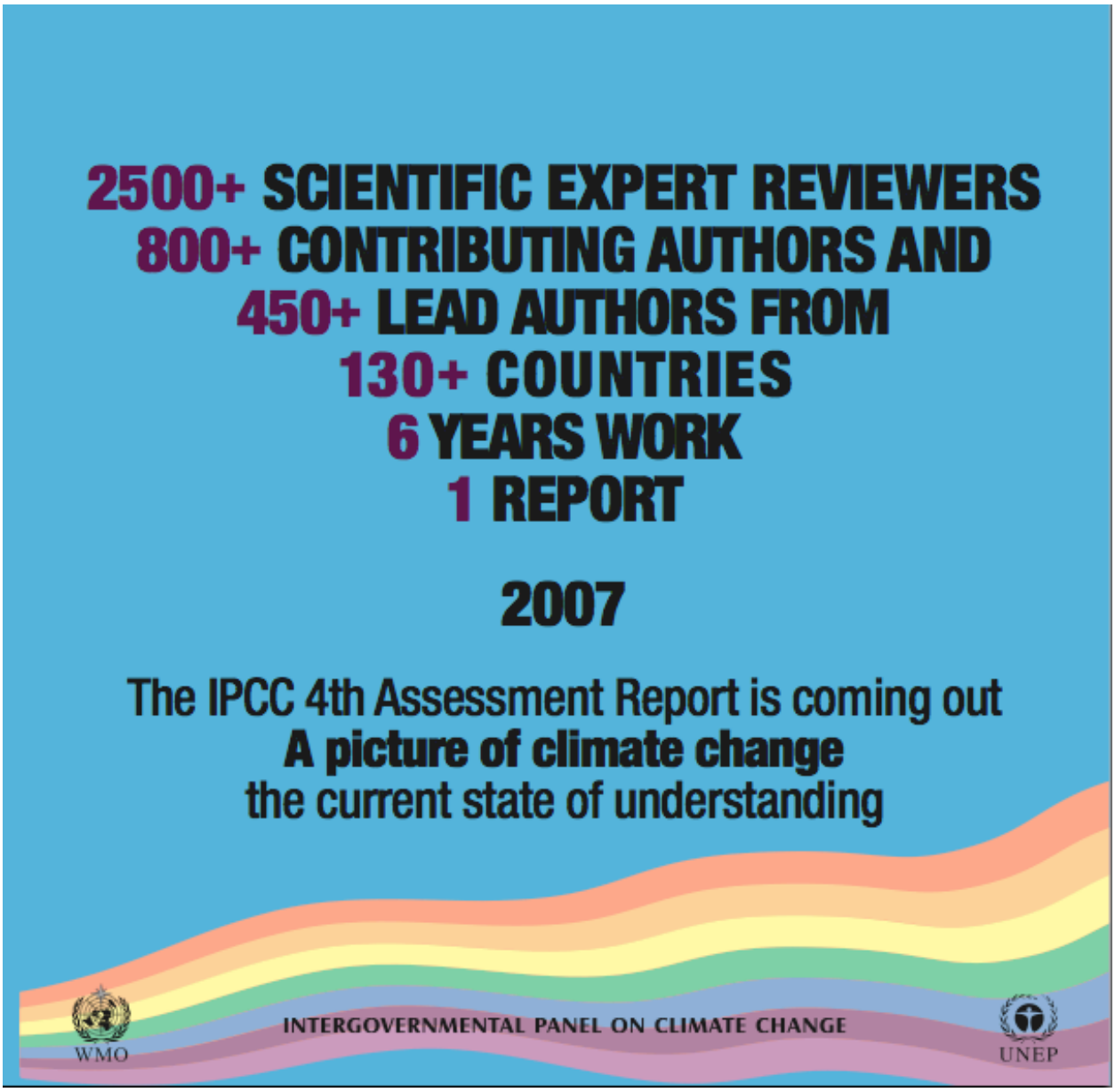
Christiansen; Weart). The Villach statement began by stressing that "scientists from twenty nine developed and developing countries" and had formed a "consensus of current basic scientific understanding" that justified the conclusion that "in the first half of the next century a rise of global mean temperature could occur which is greater than any in man's history." While not recommending specific policies (beyond support of further research), the group did insist that "the rate and degree of future warming could be profoundly affected by governmental policies."(Bolin et al.).

Although the actual impact of the Villach statement has been questioned (Franz [Torrance]; Torrance), it is the case that the statement was used at least as rhetorical cover in later climate change discourse, such as the Toronto Conference in 1988. Further, as one commentator has noted, several participants at the Villach meeting—including Bolin himself—went on to pursue "the issue in a variety of venues, and helped to shape the language that was used to talk about climate change" (Franz [Torrance] 31).

The motives behind the Villach statement have been widely examined, and may provide a clue as to what the IPCC scientists were thinking when they represented the FAR by using a consensus claim (see Franz [Torrance]). First, the Villach scientists reported feeling an increased sense of urgency because the most recent findings had emphasized that significant global warming might occur not in the distant future, but in their children's lifetimes. In other words, the scientists had a sharpened sense that political action was necessary. Second, the scientists may also have had a sense that political action was possible. The recent and remarkably quick negotiation of a global pact restricting CFCs seems to have given scientists a sense of their own political agency. (It should be noted that both of these perceptions may have been faulty—Pielke has argued that the science showed little that was new, and that the success on the ozone pact was not due to science authoritatively demonstrating the existence of the harmful effects of CFCs, but from the development of cost-effective alternatives that made CFCs obsolete and therefore easier to prohibit) Finally, the scientists gathered at Villach were asked to participate as individuals, not as representatives of their governments; they were specifically relieved of the constraints of their ordinary responsibilities. In other words, the consensus claim may have originated when scientists felt themselves to be in a position to act politically, and without responsibility.

2.4 Consensus claims and the later IPCC reports

Scientists involved in the first IPCC assessment process represented the final report as the result of a "consensus of scientists"; as far as I can tell, however, this was not the official position of the IPCC itself. This situation changed, however, in the course of the later IPCC process. Whatever its beginnings the consensus claim seems to have become one of the ways the IPCC represented itself to its audiences. For example, a flyer for the Third Assessment Report represented it as "an authoritative, international consensus of scientific opinion" (quoted in Boehmer-Christiansen and Kellow 116). This advertisement for the Fourth Assessment Report echoed the now-familiar themes of unanimity and quantity:



The emphasis on consensus also became codified in the IPCC's internal procedures, as they became increasingly settled after the first (and quite rushed) assessment process. As early as 1991, a rule was adopted stating that "in taking decisions, drawing conclusions, and adopting reports, the IPCC Plenary and Working Groups shall use all best endeavours to reach consensus" (quoted in Skodvin 115; the current, slightly revised version, can be found in Intergovernmental Panel on Climate Change).

3. The rhetorical consequences of the consensus claim

There is some evidence that the consensus claim made for the FAR did have the compelling force we expect from an appeal to authority. British Prime Minister Thatcher took the release of the WGI report as the occasion to announce her conversion to the side of the angels; from what

mix of necessity and opportunism, we can only speculate. The authority of the WGI report also proved itself during the August, 1990 plenary session which crafted the final summary of IPCC's work. Various national delegations—especially that of the U.S.—attempted to weaken the report's conclusions with amendments stressing "uncertainties." These attempts, it was reported, were successfully resisted by Houghton's insistence on his group's findings (MacKenzie and Kerwin). An editorial in *New Scientist* recounted the event:

> It was a sight to behold. There were the Americans, in Sweden last week for the Intergovernmental Panel on Climate Change, repeating their government's well-worn homilies about global warming: how uncertain all this science is, how expensive it would be to do anything, how silly to get excited until we are absolutely sure the world is in peril.
>
> And who stood up to defy them? None other than John Houghton, head of Britain's Meteorological Office, and a man not known for his radical views. He simply repeated what the IPCC scientists had "calculated with certainty": that Earth will get warmer, that there will be largely incalcuable but probably dire results if we do not curb greenhouse gases, and that the sooner governments deal with this, the better. Becaue the scientists insisted that they do know a bit about what is happening to the planet, the American emphasis on uncertainty will not now be part of the IPCC's report to the World Cllimate Conference in November ("A Climate of Reason").

More significant, however, were the consequences of the consensus claim on the future public discourse on global warming. As I speculated above, the IPCC scientists may have inherited from the scientists gathered at Villach a feeling that they could make a consensus claim because they were acting "irresponsibly," outside of their ordinary duties as (predominantly) government scientists. The *making* of the consensus claim, however, committed the IPCC scientists, and later perhaps the IPCC itself, to a new set of responsibilities. As I have argued elsewhere, in appealing to authority, a speaker exerts force on others at the cost of undertaking significant commitments herself (Goodwin "Cicero's Authority"). But these commitments an "argument [or disagreement] space," within which they can be "called out" by opponents (Eemeren et al.), and the speaker forced to defend them. The result is that the force of an appeal to authority arises not just from the single, authoritative expression of a view, but from an entire process of meeting the commitments undertaken in that expression. In other words, when IPCC scientists represented the FAR by making a consensus claim, the force of that claim depended not just on the FAR itself, but "on the characteristics of the extended and extensive social process leading up to as well as coming after an assessment report" (Clark, Mitchell and Cash 14). In the following, I sketch very quickly the contours of the process the IPCC had to undertake—the argument space it had to defend—in order to justify the consensus claim. I rely largely on "common knowledge" about the controversies surrounding the IPCC, and undertake responsibilities to provide evidence that I will have to live up to (at some point in the future).

First: however confidently proclaimed in representations of the FAR, in 1990 "consensus" was less an achievement than a ideal. Even some of the IPCC leaders admitted in retrospect "that, at least in its initial phase (the first assessment) the IPCC process [had] not been sufficiently inclusive" (Skodvin 114). Over the next decade, the IPCC faced many objections that it was wrongfully excluding some fields, nations, or individuals. To live up to its rhetoric, the IPCC had to respond by expanding its reach and integrating these objectors within its "consensus"

(Shackley; Elzinga). This is apparent in the quantitative inflation between the claims of approximately 300 scientists from approximately 30 countries in 1990, to approximately 4000 scientists from approximately 130 countries in 2007. Meanwhile, however, the IPCC endured close to twenty years where its authority was undermined by objections which were legitimate under its own announced standards. By committing the IPCC to quantitative inclusiveness, those representing its work as a "consensus" created grounds for controversy.

Of course, it proved impossible to incorporate literally *everyone* into the IPCC process. The IPCC and its defenders therefore were obliged to undertake a second task: the "boundary work" necessary to distinguish those qualified to contribute to a scientific consensus on global climate change, from those who were not. This work is evident in some of the press reporting above, where the "minority" was characterized not only as quantitatively small, but as "extreme" and "scientifically suspect." These claims, too, required defense (Jackson). Unfortunately, the need for boundary work also likely created temptations to make illegitimate attacks on the scientific credibility of opponents whose views did not fit with the consensus (Shackley). Even when successful and legitimate, boundary-drawing created additional problems. If indeed every scientist within the consensus agreed that policy action was urgent, and every scientist outside thought otherwise, a strong *appearance* of politicization was created—i.e., that the boundary between "insiders" and "outsiders" was based on political views, not scientific relevance. Thus just months after the release of the FAR, Houghton was already being forced to defend the IPCC against claims that it was "'dominated by those who were already in the pro-global-warming camp'" (*The Independent* (London) 11/6/90). Alternatively, the problem of boundary-work could be managed by defining "consensus" more carefully, allowing cases where "consensus" could co-exist with dissent. Asserting such definitions, however, opened space for yet further meta-controversies about the nature of scientific consensus (Pielke "Consensus About Climate Change?").

To manage their expanding and dispute-ridden enterprise, the IPCC was also forced to continually re-invent itself, slowly developing an elaborate body of rules and procedures. One example of this institutional "dynamism" was in the ever-evolving procedures for peer review, required for the IPCC to remain "politically credible" (Agrawala "Structural and Process History of the Intergovernmental Panel on Climate Change"). On one hand, these rules allowed a high degree of procedural transparency to be achieved, and thus contributed to the authoritativeness of the IPCC's judgments. On the other hand, these rules also legitimated yet further rounds of objections —for example, that the peer reviewers were biased, or (on the contrary) were being ignored by the lead authors. As one commentator has noted, even with the FAR "criticism was directed more towards the form and procedure than to the content" (Elzinga 240). Similar controversies arose over the cut-off dates for articles to be included in the reviews. There were accusations that some scientists and journals were gaming the system, putting work out to just make the deadline without an opportunity for others to respond. These objections, too, had to be dealt with.

Finally, the consensus claim created opportunities for opponents to object that the IPCC's emphasis on consensus was distorting the science itself. Once the consensus claim was made, scientists involved in the ongoing IPCC process had reasons not just to consider the scientific evidence, but to consider the possible effect of their statements on their ability to defend the consensus claim. Sluijs et al. have pointed out that the "climate sensitivity" (i.e., the temperature increase predicted for a doubling of CO2) has been reported as between 1.5 and 4.5 C since

1975, with a "best estimate" of 2.5 or 3 C (an observation that still holds with the Fourth Assessment Report). They have suggested that one reason for this "anchoring" was that changing the figure would "embarrass" the IPCC and undermine its credibility, and that scientists were therefore forced (among other things) to "disqualify" results that did not conform (see also Boehmer-Christiansen and Kellow; and from the other side, Oppenheimer et al.). The IPCC and its defenders had to reply to these objections as well.

"Consensus" is a strong claim, and it opens a wide argument space; that is what I have been trying to suggest in the above sketch. By representing their work as a "consensus," the scientists of the IPCC essentially legitimated the objections of those commonly labeled as "denialists," and committed themselves to a twenty year process of replying to them.

4. Rhetorical alternatives

A scientific consensus was not required by the instruments which brought the IPCC into being. The UN resolution which endorsed the WMO/UNEP action creating the IPCC called on the new organization "to provide internationally co-ordinated scientific assessments of the magnitude, timing and potential environmental and socio-economic impact of climate change and realistic response strategies," and in particular "to initiate action leading, as soon as possible, to a comprehensive review and recommendations with respect to . . . the state of knowledge of the science of climate and climatic change." (A/RES/43/53, 1988). What the policy-makers appear to have been looking for was scientific knowledge usable for policy-making. Is there a way of providing this that does not involve making a consensus claim?

There are some indications from the time of rhetorical alternatives available to the IPCC. One would have been to incorporate dissent more openly into the report itself. An editorial in *Nature* criticized the FAR WGI report for "lack[ing] the incisive discussion of the remaining physical uncertainties." The commentator concludes that this "would have persuaded sceptics that their arguments had been given due consideration" ("Next Steps on Global Warming"). Although this seems over-optimistic, still the conspicuous inclusion of dissenting views would leave the dissenters fewer legitimate grounds for complaint. Of course, it would also prevent those supporting the IPCC from making a consensus claim.

Another assessment from the period suggests that scientists also found it possible to explicitly limit the commitments they were undertaking. Consider the following introduction to a 1983 NRC report on climate change:

> The CO2 issue is so diverse in its intellectual components that no individual may be considered an expert on the entire problem. For this reason, as noted above, the CDAC prepared or commissioned separately authored and separately peer-reviewed papers in each area, with no attempt to force unanimity of style or of views. For the same reason, the Committee members felt themselves incapable of judging and endorsing as a group the details of each paper's analysis and findings. Thus, each paper should be viewed primarily as the product of its individual author or authors, having had the review and comment of the Committee members and other reviewers but not enjoying the unanimity of conclusions possible in a more homogeneous and less controversial topic. However, the Committee's work did reveal a large core of views, findings, conclusions, and recommendations on a more general level, which all members could

> wholeheartedly and responsibly endorse. These are presented in the Synthesis of the report. Despite the existence of some areas of continuing controversy, such as the carbon cycle, there are no major dissents with respect to the contents of this assessment (Changing Climate: Report of the Carbon Dioxide Assessment Committee).

Of particular interest is this report's recognition that the diversity of disciplines involved in climate change research would make it difficult for "unanimity" to be achieved, and its explicit assignment of responsibility for the chapters to the named authors.

Let me close this section with a call that "more research is needed!" into the *report* as a rhetorical strategy—a subject that, as far as I can tell, has been almost entirely unexplored (Lindeman is the only discussion I've been able to locate). It could be that we would find that the "report strategy" does not aim to construct an appeal to expert authority enforcing its conclusions, but attempts to seriously engage a lay audience with the modes of expert reasoning used to reach those conclusions. In the terms I suggested above, a "report strategy" would be taking an "epistemic," as opposed to "social," approach to communicating science. There are several bodies of theory which might offer conceptualizations of what a successful report accomplishes: a "translation" of expert knowledge into lay terms (Cash et al.); "building capacity" in the lay audience to understand the expert reasoning (Mitchell, Clark and Cash); or assistance to the lay audience in developing "interactional expertise" (Collins and Evans). And it seems likely that pursuing a "report strategy" would require from its authors commitments different from, and much less than, the strategy of making a consensus claim.

5. Conclusion

Naomi Oreskes has argued that "denialist" demands for "scientific proof" are fundamentally ill conceived; what science can offer public policy is not proof, but consensus. In one way, my account of the IPCC's rhetorical strategy suggests that she is right. A scientific consensus, claimed for the IPCC's First Assessment Report and then painstakingly "manufactured" in response to objections, forced an alteration the state of policy discourse. Today, I believe, no public figure or organization that wants to remain mainstream can openly question the existence of anthropogenic global warming. To do so would be to go against the authority of science.

From another perspective, however, I have been arguing that the IPCC's rhetorical strategy was a catastrophic success. Instead of taking "denialism" as a last-ditch rhetorical tactic which illegitimately "manufactures" doubt, I have suggested that claims to authority open an argument space within which "denialist" objections are entirely legitimate. A defensible consensus on climate change was at last achieved, overcoming these objections. But it took two decades to fulfill the commitments undertaken in the initial consensus claim; an extreme example of Collins & Evans' rule that "the speed of political decision-making is faster than the speed of scientific consensus formation" (Collins and Evans 269). Throughout this period, the interests opposing action on climate change were happy to agree with the IPCC that more research and yet another report was needed to reduce uncertainties (Shackley and Wynne). And the ultimate success of the consensus has produced no discernable policy results, since there remain plenty of ways of arguing against mitigation or adaptation, even in the face of undeniable global change.

Instead of insisting on scientific proof, or scientific consensus, as the necessary "foundation" or "basis" or "grounding" for policy, perhaps scientists and citizens alike would do better to

recognize that policy-making must proceed even with no "foundation" or "basis" or "grounding" in science at all (Pielke The Honest Broker: Making Sense of Science in Policy and Politics; Sarewitz). This, after all, is the traditional posture of rhetoric: an approach to civic deliberation that views contingency ("probability") as the terrain where policy always gets made. From citizens, this might require a willingness to proceed even in the face of uncertainties; from scientists, a more prudent management of their rhetorical commitments; and from both, an increased resistance against the temptation to look for authority from science.

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