Democratization, International Knowledge Institutions, and Global Governance

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The central problem of democracy has long been theorized as how to place appropriate constraints on the responsible exercise of power. Today, this problem is most acute in global governance. This article examines the rapid rise in the creation of international knowledge institutions, arguing that these institutions reflect a growing effort by nations and publics to assert democratic constraints on the on the global exercise of power through their ability to structure processes of reasoning and deliberation in global society. Specifically, the article argues for the need to attend carefully to processes of knowledge-making in international institutions, including the roles of international institutions in setting standards for the exercise of reasoning, their contributions to the making of global kinds through their work in classifying and reclassifying the objects of international discourse, and through their roles in opening up and constraining participation in international deliberation. The article concludes that the construction and deployment of policy-relevant knowledge are a significant source of power in their own right in global governance that need to be subject to their own democratic critique.

Theories of deliberative democracy suggest that the central problem in the constitution of democratic order is "how to preserve liberty by inventing checks on the wielders of power, apportioning and monitoring it, ensuring its responsible exercise" (Keane 1998, xxii). For much of modern history, democratic publics have struggled to place limits on the legitimate exercise of power within the context of the nation state. In recent decades, however, processes of globalization have blurred the lines between national and international governance, at once calling into question classical solutions to the dilemmas of power in democratic societies and highlighting the absence of democratic constraints on the abuse of power in world affairs (Miller 2005). As Robert Keohane has observed, "Institutional protection from the arbitrary exercise of coercion, or authoritative exploitation, will be as important at the global level as at the level of the national state" (Keohane 2002, 326). Yet, to date, the prospects for constituting democratic order in global politics—for legitimating and holding

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accountable those who exercise power in a globalizing world—remain uncertain.

Much of the existing scholarly debate surrounding the problem of democratic legitimacy and accountability in global governance focuses on the growing power of international institutions. In the wake of antiglobalization protests and their criticisms of the International Monetary Fund (IMF), World Bank, and World Trade Organization, scholars have begun to examine more closely the autonomous power and authority wielded by international institutions (Barnett and Finnemore 2005) and subject it to democratic theorizing (Fung 2003; Howse and Nicolaidis 2003; King 2003; Lohmann 2003; Stiglitz 2002, 2003; Verweij and Josling 2003). As international institutions have acquired new responsibilities to manage global economic processes, a growing disjuncture has opened between their power to shape world order and their lack of legitimacy in the eyes of skeptical publics.[1] This growing "democratic deficit" in international governance poses something akin to a principal–agent problem: How can democratic publics assert appropriate controls over international institutions that have escaped the bounds of acceptable exercise of power and authority? To address this question, theorists have suggested turning to "deliberately democratizing multilateral organization" by fostering democratic reforms to decision-making processes internal to international institutions (Verweij and Josling 2003, 1).

This article retains a central focus on international institutions but seeks to move the discussion in a new direction, asking whether international institutions might contribute positively to the securing of democratic legitimacy and accountability in international governance. Constraining the power and authority of international institutions reflects only a small part of the problem of democratizing global politics. In a rapidly globalizing world, distrustful citizens have cast their skeptical gaze not only on the World Trade Organization and the IMF, but also on other social actors. Many of the most complex and egregious problems of accountability in global politics surround the capacity of global publics to constrain not international institutions but powerful states (Grant and Keohane 2005; Keohane 2003). Popular outrage around the world over the invasion of Iraq and prisoner abuses at Guantanamo Bay and Abu Ghraib reflects skepticism about the arbitrary and capricious use of U.S. power in the pursuit of national interest (see, e.g., Held 2004). At the same time, myriad nonstate actors (including corporations, nongovernmental organizations [NGOs], epistemic communities, new social movements, religious organizations, and terrorist networks) have seen their power and authority to shape world affairs grow significantly, and often unchecked by democratic constraint, in recent years (Forsyth 2004; Haas 1990; Khagram, Riker, and Sikkink 2002; Miller 2003). Efforts to grapple successfully with the problem of democratic legitimacy in global politics must therefore find ways to apportion and monitor the responsible exercise of power among the full range of actors in global society.

The question I pose is whether international institutions can contribute to this broader problem of establishing legitimate limits on the global exercise of power through their ability to structure processes of reasoning and deliberation in global society. In the absence of an authoritative global state that could serve as the foundation for a more institutionally structured democratic order—which seems a reasonable assumption for the foreseeable future—strengthening deliberative processes appears to several authors to be the most promising approach to establishing greater accountability in international governance (Adler and Bernstein 2005; Chayes and Chayes 1995; Keohane 2002). In turn, deliberative theories of democracy have long recognized that the appeal to reason, fact, and knowledge is essential to both the constitution of democratic legitimacy and to its sanctioned critique in domestic contexts:

> A part of exercising legitimate democratic authority is the public act of justification to those over whom authoritative decisions are binding. In making demands on citizens, legislative bodies, administrative agencies, and appointed experts must explain their reasons and demonstrate that their demands can reasonably be expected to serve the common interests of free and equal citizens. (King 2003, 24)

In domestic contexts, this concern has given rise to considerable scholarship concerning how democratic societies produce and validate public knowledge claims, how they resolve conflicts over divergent interpretations of evidence and uncertainty, and how they put knowledge to use in constraining the exercise of power and authority.[2] That similar dynamics might be at work in international settings is also suggested by a range of constructivist studies that highlight the importance of knowledge, expertise, and epistemic frameworks in constituting both relations among states (Adler and Bernstein 2005; Adler and Haas 1992; Haas 1990, 1992) and the independent power and authority of international institutions (Barnett and Finnemore 2005; Miller 2001, 2003, 2004a, 2006).

Strikingly, however, there has been relatively little effort among scholars of international governance to examine critically, and in detail, the processes by which knowledge claims are produced and validated in international contexts (Jasanoff 1997; Jasanoff and Martello 2004; Rayner and Malone 1998; Reardon 2005) or how the ability to secure objective, public knowledge about the events and processes of international civic life might contribute to nascent efforts to order global spaces and, hence, to constraining the ad hoc, arbitrary, and capricious exercise of power in global society (Miller 2004b).[3] I argue, therefore, that there is a need to examine the precise mechanisms by which international institutions produce and validate knowledge claims and translate their expertise into power and authority—to attend closely, in other words, to *knowledge-making* as well as *decision-making* processes in international governance. Doing so, I argue, will provide greater insight into both the potentially powerful role that international institutions may be positioned to play in setting epistemically constituted limits on the legitimate exercise of power by actors in global

society as well as the ways in which democratic legitimacy is also caught up in how knowledge is produced and validated globally.

In the next section, I elaborate this argument, highlighting the emergence of an increasingly important class of *international knowledge institutions* designed specifically to produce and validate knowledge in global politics.[4] Rapid growth in the number of international knowledge institutions reflects, I contend, a desire on the part of global publics to replace the logic of states pursuing arbitrary and ad hoc national interests with a logic of deliberative legitimacy in international relations. That global politics is increasingly constituted by richly textured deliberative processes in which struggles over the truth status of knowledge claims play central roles (such as the dispute in 2002–2003 over the existence of Iraqi weapons of mass destruction (WMD) or recent disputes at the World Trade Organization over how to judge the safety of genetically modified organisms) suggests at least partial success in this regard. I then turn in the following sections to an examination of three mechanisms by which international institutions contribute to the epistemic ordering of world affairs: (1) by *setting international knowledge standards*, that is, by fixing rules for modeling and monitoring global systems and for deploying evidence in global policy debates; (2) by *making global kinds*, that is, by bringing into being new ontological frameworks, classifications, and mappings that frame the conceptual underpinnings of global deliberation; and (3) by *constructing new deliberative spaces* in which claimants acquire standing through claims to knowledge and expertise. For each, I investigate not only knowledge-making processes and their potential to set limits on the legitimate exercise of power in international governance but also questions of democratic legitimacy inherent in both their organization and use. Finally, I conclude by asking whether, in the context of contemporary international governance, international knowledge institutions can reasonably be considered *proto-democratic experiments in international governance*—preliminary attempts to construct independent sources of authority that can use their ability to produce and validate knowledge to shape intersubjective epistemic frameworks and place limits on the credibility of justificatory claims, and so to constrain the exercise of power and authority in world affairs.

Expertise, Deliberation, and International Order

The second half of the twentieth century has witnessed a slow, yet perceptible shift from what might be termed the closed world of Great Power and imperial diplomacy—in which, for example, Stalin, Churchill, and Roosevelt could meet at Yalta and carve out the broad outlines of a postwar world order—to much more open and deliberative processes in which the public sphere plays a significantly more important role in international governance. Whatever similarities the U.S. invasion of Iraq might have suggested to an imperial nineteenth-century past, the six-month world-

wide debate that preceded the invasion itself, centered on events at the United Nations (UN) Security Council and carried out in the global media, at least hints at a growing insistence that even the most powerful states must justify their actions to global publics on the grounds of reason and evidence, or risk a loss of legitimacy at home and abroad.[5] So, too, arguably, does the recent entry into force of the Kyoto Protocol, where scientists and others have managed, largely through processes of reasoned deliberation and dialogue, to persuade many of the world's richest countries to accept long-term restrictions on the burning of fossil fuels. In both cases, as we will see later in greater detail, public deliberation helped define the bounds of legitimate exercises of state power in world affairs.

In part, this shift has occurred as a result of the growth and proliferation of multilateralism as the basic form of institutional development after 1945 (Ruggie 1993). The dynamics of multilateralism have created a more dynamic and open interplay among states within international institutions. By 2000, the UN system included dozens of major multilateral organizations, while hundreds, if not thousands, of smaller multilateral organizations—each constituted by a particular international treaty—now also exist. Within the context of multilateral institutions, as Abram Chayes and Antonia Handler Chayes have suggested, sovereignty has come to mean "membership in reasonably good standing in the regimes that make up the substance of international life" (Chayes and Chayes 1995, 27). As a matter of practice, state behavior within these regimes is judged according to the normative principles laid out by the underlying treaty frameworks (see also, Kratochwil 1989; Litfin 1998). Given both the ambiguity frequently present in treaty commitments as well as the interpretive flexibility generally available to participants regarding evidence of treaty violations, however, these judgments are often contested, not only among states but also among other actors in world affairs. The result has become an increasingly public discourse about proper state behavior in world affairs. As Chayes and Chayes (1995) conclude: "The fundamental instrument for maintaining compliance with treaties at an acceptable level is an iterative process of discourse among the parties, the treaty organization, and the wider public" (25).

In recent years, however, the opening and expansion of deliberation in international governance has gone beyond the deliberative opportunities created by multilateralism. The argument that key aspects of social, economic, and environmental processes can be understood and managed on scales no smaller than the globe itself has blurred the boundaries that were once taken for granted as cleanly separating the realms of international relations, in which states dominate, from domestic politics, where states act alongside a wide range of nonstate actors (Jasanoff 2001, 2004c; Miller 2004b; Takacs 1996). While states remain powerful actors in global society, confidence has declined in their ability, on their own, to adequately address the emergent challenges of a complex, interdependent world, thus giving rise to demands for new

approaches to international governance (Keohane and Nye 2001; Miller and Edwards 2001; Rosenau 1992). A wide variety of nonstate actors increasingly garner seats at the negotiating table alongside states in multilateral governance institutions, from transnational corporations to NGOs, other international organizations, indigenous peoples, and epistemic communities (Khagram, Riker, and Sikkink 2002). The presence of NGOs, especially, has opened up meetings of international negotiating forums to wider public scrutiny, as new technologies such as the Internet have facilitated the dispersal of information regarding the day-to-day activities of these organizations.[6] Outside the formal institutions of international governance, other actors have also increasingly sought to shape the course of world affairs, including social movements, global publics, media organizations, and even terrorist networks.

The opening up of international governance to greater deliberations among a wider array of actors has contributed, perhaps not surprisingly, to an increasing preoccupation with struggles over the truth status of knowledge claims and the resources for making those claims more or less believable to diverse publics. In this, global politics increasingly mirrors its domestic counterparts in democratic societies, for which disputes over knowledge claims have become an endemic element of modern and postmodern politics (see, e.g., Nelkin 1984). On such issues as the risks of climate change and biodiversity loss; the status of Iraqi, North Korean, and Iranian nuclear facilities; the safety of trade in genetically modified organisms; and the adequacy of plans for containing outbreaks of emerging diseases, to name only a few, international relations has experienced extensive periods of epistemic critique and contestation in recent years. Justificatory arguments about both the substance of international norms—what goals and objectives international governance should strive to achieve—as well as compliance with those norms demand recourse to knowledge, evidence, and proof. Chayes and Chayes (1995, 25) highlight, for example, the importance of " 'jawboning' . . . the role of argument, exposition, and persuasion in influencing state behavior." Stephen Epstein calls these episodes of epistemic conflict *contests of credibility*: struggles by "claims-makers to enroll supporters behind their arguments, legitimate those arguments as authoritative knowledge, and present themselves as the sort of people who can voice the truth" (Epstein 1996, 3). Not just states but a growing array of nonstate actors have become active in these disputes, bringing heterogeneous epistemological and ontological frameworks to efforts to classify, map, and make sense of global systems and problems (see, e.g., Daemmrich and Krücken 2000; Jasanoff 1986, 1995, 2005; Parthasarathy 2004).

Faced with pervasive skepticism and dispute regarding the evidentiary knowledge base of global policies, actors in global society have followed their domestic counterparts in seeking to institutionalize rules and practices for knowledge production and validation that can command the necessary authority to resolve disputed knowledge claims. The result has

been an explosion of new *international knowledge institutions* whose purpose is to build knowledge bases for global policymaking that can command transnational credibility. Hundreds of international advisory committees now dot the landscape of international affairs. Nearly every new international environmental treaty, for example, contains provisions authorizing a new scientific or technical advisory committee. The largest such advisory bodies, such as the Intergovernmental Panel on Climate Change (IPCC) and the Millennium Ecosystem Assessment (MA), have budgets in the tens of millions of dollars and enroll thousands of scientists worldwide in their activities. Existing institutions have also been reconfigured for new missions. For example, the Codex Alimentarius has found its practices and norms reorganized as it has been enrolled in debates over the science of food safety risks within the World Trade Organization. Likewise, in the wake of revelations of a nuclear program in Iraq after the Gulf War, the International Atomic Energy Agency (IAEA) was given new powers to investigate the existence of clandestine nuclear facilities in countries suspected of pursuing nuclear weapons programs (Scheinman 1993).

These institutions seek to generate knowledge relevant to important global issues, to settle transnational disputes over knowledge claims, and to bring reason and evidence to bear on global policymaking. In so doing, the goal of these institutions is to place limits on the legitimate modes of justification and reason-giving that occur in international governance and so also to place limits on the legitimate exercise of power and authority. They do so through a form of productive power to help constitute the intersubjective epistemic frameworks through which actors interpret and act in the world (Adler and Bernstein 2005; Walsh 2004). In this regard, international knowledge institutions can be said to claim a form of *expert authority*—the power of these institutions to constitute social order by molding the underlying epistemic frameworks that guide the definition of problems, the classification of social kinds, and the evaluation of social behaviors (Barnett and Finnemore 2005). Following Haas (1990, 1992), who argued that epistemic communities wield a form of knowledge-based influence in world politics, Michael Barnett and Martha Finnemore (2005) suggest that international organizations acquire power and authority in international relations through the deference of other participants to their claims to knowledge and truth.

This argument leaves open certain questions, however, regardless of whether we are talking about epistemic communities or international organizations. How is expert authority acquired or constituted in the first instance? Why do people opt to grant authority, and under what circumstances, to a particular community or organization of experts? Second, what can be said about expert authority in the relatively common case of persistent epistemic dispute, in which powerful actors, other experts, or ordinary people refuse to defer to expert judgments or claims? Consider, for example, the IAEA claims about Iraqi WMD or the IPCC claims

regarding climate change. In neither case has the Bush administration simply conceded their knowledge. Instead, the administration has repeatedly mobilized counter-experts, seeking, as Adler and Bernstein (2005) put it, to create "epistemic chaos" (303). Must we, in epistemically contested settings, simply abandon the concept of expert authority? A third question, central to our concerns in this article, is whether expert authority can be constituted democratically. While Barnett and Finnemore suggest that the expert authority of international organizations has been built, at least in part, on the idea that states sought out their expertise in order to pursue liberal social goals, they also recognize that this has—as in Stiglitz's (2002) critique of the IMF—also contributed to their ability to do harm.

In the following three sections, as I explore in detail three mechanisms through which expert authority is expressed in international governance, I want to suggest several ways of thinking about expert authority that are important to answering these questions. First, expert authority is constituted dynamically, in the context of discursive and institutional moves within broader deliberations over the justification and organization of global policymaking. States often seek to vest new international institutions with expert authority in an effort to resolve existing epistemic disputes; over time, however, the authority of these institutions depends on the outcomes of the credibility contests they face on a regular and ongoing basis. Second, expert authority is constituted mutually with political authority. Consistent with broad findings in the field of science studies, these institutions have acquired independent authority to order global discourses through processes of coproduction, in which they have successfully interwoven both epistemic and political authority (for a case study of the IPCC, see Miller 2004a; for a review of the literature on coproduction, see Jasanoff 2004b). Put simply, when institutions seek to defend their expert authority in political domains, they frequently do so with not only epistemic claims but also political arguments—and their success ultimately depends on the simultaneous construction of expert and political authority.

Finally, I want to suggest following Mark Warren (1996) that democratic legitimacy and expert authority go hand in hand. Warren argues, and the cases that follow also demonstrate, that expert authority derives not from a deferral of judgment by citizen onlookers, but from a context of ongoing critical scrutiny: "Only because authorities are scrutinized critically (including by attentive nonexperts) do they come to possess authority" (56). This point can also be made another way. In his discussions of epistemology, legitimacy, and democracy, Allen Buchanan (2002) highlights the need for a free exchange of ideas to counter the potential moral hazards of "unwarranted epistemic deference" (104). This suggests the need for independent sources of knowledge claims, such as those increasingly provided by international institutions, which can act as a counterbalance to the knowledge claims of powerful actors and so reduce the

possibilities for inappropriate foreclosing of epistemic debate. It also suggests the need for international knowledge institutions to maintain openness to critique vis-à-vis their own knowledge-making processes. Following this line of argument, in the concluding section of the article, I will argue that, by developing and enhancing open systems of knowledge production, international institutions might both strengthen limits on the legitimate exercise of power by other actors within the international system and also reduce their own reliance on forms of illegitimate, compulsory power criticized so heavily by both scholars and the antiglobalization movement.

Setting and Policing Standards

International relations scholars have long recognized the importance of standard setting and policing as a mechanism by which international regimes shape the conduct of world affairs by enabling actors to hold one another accountable to agreed norms and behaviors (Krasner 1983). In a recent article, Ruth Grant and Robert Keohane (2005) have argued for the central importance of a range of different accountability mechanisms in constraining the arbitrary exercise of coercion in global society. For many of the actors that operate in world affairs, however, and especially powerful states, they argue:

> The only forms of external accountability to which (these actors) are subject, across a range of issue areas, are peer accountability and reputational accountability. These attempts at accountability, however, depend on efforts, often ad hoc, to establish a basis of legitimacy on which to hold a state accountable. In the debates over war with Iraq in the winter and spring of 2003, for example, France, Germany, and Russia engaged in "soft balancing"—seeking to constrain the United States by denying legitimacy to its attack on Iraq. However, as this episode shows, it is difficult to impose peer or reputational accountability without a firm consensus on what constitutes legitimate behavior. (Grant and Keohane 2005, 11)

In this section, I explore the role that standard setting and policing by international knowledge institutions plays within debates such as the global dispute over whether the United States was justified in invading Iraq. I do not disagree with Grant and Keohane that efforts such as this one to discursively impose judgments of legitimacy on state behavior are difficult—at best. However, I want to suggest that international knowledge institutions have been designed for just such a purpose and that there are grounds for believing, even in this case, that their efforts to set and police standards, and therefore to set bounds on the legitimate and illegitimate exercise of power, have had nonnegligible impacts.

As actors in global society seek to hold one another accountable, they turn frequently to the negotiation of standards against which behavior and performance can be measured. An important question, therefore, is where the knowledge comes from to measure or judge whether actors have met

appropriate standards. Often, the answer is some form of self-reporting to the treaty organization. Self-reporting presents a number of difficulties, however, especially in cases where compliance is seen as essential to international order, as was the case in U.S.–Soviet arms control agreements. In such cases, treaties often turn to monitoring and verification programs to provide the requisite knowledge (for a thorough discussion of reporting, monitoring, and verification and their challenges, see Chayes and Chayes 1995, especially ch. 7 and 8).

International knowledge institutions represent a special case of the broader class of monitoring and verification programs, in which monitoring and verification has been institutionalized in an independent agency with specific license to collect, validate, analyze, and/or synthesize knowledge on specific aspects of global affairs, including the behavior of various actors in the international system. Knowledge-making by international knowledge institutions can include the monitoring of global systems, for example, the behavior and status of the climate system or the ozone layer or the monitoring of infectious disease outbreaks. It can also include the development of standard metrics for reporting, for example, methodologies for inventorying national inventories of greenhouse gas emissions, or investigating the behavior of actors (often states, but not always) with respect to compliance with specific legal requirements (although this is quite rare). At stake in all of these cases is the factual status of competing knowledge claims and, at the same time, the perceived legitimacy of the negotiating positions and actions for which these claims are deployed as justification.

To examine in greater detail the role of standard setting in constituting the authority of international institutions to order global spaces, I examine further the case of the IAEA. Following the 1991 Gulf War, participants in the Non-Proliferation Treaty (NPT) regime received a nasty shock when Iraq was discovered to have developed an extensive, clandestine program geared toward the development and production of nuclear weapons. The NPT regime has long relied on a carefully constructed nuclear safeguards program to detect and deter treaty violations. As Lawrence Scheinman (1993) observes, however, the safeguards system was designed to continuously monitor declared nuclear materials in declared nuclear facilities to prevent their clandestine diversion into weapons programs. With the Iraqi discoveries, it became apparent that the system made no provision, at least in practice, for the investigation of facilities or materials that went undeclared. Indeed, Scheinman notes, the initial safeguards system was specifically designed to limit this kind of intrusiveness into state affairs. Its purpose was to safeguard the operation of nuclear power plants in countries like Germany and Japan, which were not seen as risks for illicit nuclear programs, while minimizing the risk that safeguards could present opportunities for industrial espionage through the development of extensive investigatory powers.

Moving to close this gap, the IAEA and its member states strengthened the organization's nuclear safeguards system after the Gulf War. The new approach is grounded, first, on a commitment to "providing assurance that no *undeclared* material or *clandestine* facilities or activities exist in states that have ratified the NPT or equivalent non-proliferation agreements with the IAEA" and, second, on "the IAEA's right of special inspection, which derives from the statute allowing access 'at all time to all places and data,' and is incorporated in safeguards document INFCIRC/153 that governs IAEA full-scope safeguards agreements" (Scheinman 1993, 4, sic). Since 1991, the IAEA has used its new power to conduct greatly expanded inspections of nuclear sites and facilities in Iraq, North Korea, Iran, and Libya, helping the NPT regime to uncover the extent of nuclear programs in these countries and to bring the latter three, at least, to the negotiating table.

The expanded standard setting and policing authority of the IAEA can be understood as setting limits on the exercise of power and authority in international affairs in at least two ways. First, it seeks to limit the power of states to establish illicit nuclear weapons programs by making violations of the NPT more visible to global society. In so doing, it strengthens the commitment of global society to openness and transparency for a crucial arena of security policy. If a state is to garner the benefits of accession to the non-proliferation treaty, including external expertise and funding to help it develop a domestic nuclear energy program, then it must be willing to submit to international standards for the open and transparent operation of that program. It must provide access to the IAEA, so that members of the NPT regime feel confident that it is not seeking to circumvent the purposes of the regime by developing WMD. Indeed, the threat to expose clandestine nuclear weapons activities marks the specific desire of the IAEA members to constrain the power of states to build illicit weapons programs without the necessity of resorting to violence.[7]

Second, the IAEA safeguards regime also seeks to limit the power of other states to inappropriately use claims about violations of the NPT to justify economic or military action against a country with a suspected illicit weapons program. The IAEA has worked diligently to set internationally agreed standards for the investigation and evaluation of claims regarding violations of the NPT and also to develop and maintain a considerable degree of credibility as a technically expert and politically neutral body (Blix 2004). In this regard, the IAEA has sought to establish an authoritative capacity to resolve disputes regarding the NPT violations. By and large, states followed the IAEA's lead, at least up through 2003, in large part because the IAEA inspections were seen as a powerful tool for providing justification for acting against states suspected of violations. Such inspections were thought to offer public witness to a violation, either through uncovering evidence of the violation and duly presenting it before the IAEA's Board of Governors or the United Nations Security Council or through triggering a public rejection of inspectors by the

country in question. In this manner, it was thought that the IAEA inspections would provide the necessary justification for collective international action.

Throughout the 1990s and early 2000s, this experiment received several tests, in North Korea, Iraq, and Iran. For sake of brevity, I will focus here solely on the run-up to the U.S. invasion of Iraq in March 2003. The events surrounding the U.S. decision to invade Iraq pose in perhaps the starkest possible terms some of the issues at stake in this article. For substantial segments of both American and global publics, questions of knowledge and evidence were crucial to judging the legitimacy of American actions and were hotly contested. Of particular significance at the time was (and remains today) the question of Iraq's possession of nuclear, chemical, or biological weapons. The Bush administration insisted that Iraq had used the absence of international inspectors to rebuild its illicit nuclear, chemical, and biological weapons programs. It further argued that the United States would pursue its right to intervene militarily unless the weapons were destroyed and the programs were dismantled. Ultimately, however, they proved unable to persuade the UN Security Council to authorize this action. Underpinning this decision was the persistent unwillingness of the IAEA and the UN Monitoring, Verification, and Inspection Commission (UNMOVIC) (which was responsible for the investigation of biological and chemical weapons in Iraq) to countenance the Bush administration claims that existing evidence was conclusive regarding Iraqi possession of WMD. Indeed, the two agencies consistently denied that they had any concrete evidence that Iraq still possessed illicit weapons or weapons programs.

The disagreement came to a head in a series of public meetings of the Security Council in which, alternately, Hans Blix, Mohammed ElBaradai, and Colin Powell presented their interpretations of available evidence. All three presentations were made in an overwhelmingly technical format, seeking to present a factual basis for the competing claims. This reflects precisely the kind of justificatory exercise highlighted in theories of deliberative democracy and put both the administration's and its opponents' claims and evidence on the public record. Despite persistent doubts in many parts of the world about the factual basis of its justification for war, the Bush administration pushed ahead with the invasion in late March 2003. The administration's gambit worked, at least temporarily, in that Powell's speech to the Security Council received extensive media coverage in the United States and shored up support for the administration in the United States long enough to get the invasion underway. For many around the world, however, it also highlighted the weaknesses inherent in American reasoning and its evidentiary basis, leaving the administration open to subsequent criticism, a political fact that the administration recognized acutely. Scientific teams from the United States followed literally on the heels of frontline troops in a massive search for Iraqi WMD in the first few months of the war, a fact which further undercut the administra-

tion's credibility when the search came up empty and may have contributed to the administration's electoral weakness in its reelection bid in 2004. Subsequent to the election, the U.S. Commission on Weapons of Mass Destruction added its voice to the growing sentiment that claims that Iraq possessed either WMD or the capacity to build them in the near future were simply wrong and represented a serious failure of the U.S. intelligence system (Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction 2005).

One interpretation of these events would be that states in the international system are not subject to the same norms of justification in global contexts than they are in domestic settings. Thus, at least for the case of national security, the notion that knowledge claims might serve as the basis for constraining how power is used in the international system is problematic at best. When states feel their national security is at stake, they are perhaps least likely to attend to questions of whether or not global publics, and possibly even their own publics, accord legitimacy to their actions. Such an argument would go too far in my view, however, in underestimating the importance of epistemic legitimacy as an element in this particular case. I would contend that the circumstances surrounding this case actually offer a more optimistic (although not entirely sanguine) interpretation.

Even in domestic contexts, the effectiveness of legitimacy as a constraint on power is not measured solely at the point of decision. For any system, complete prevention of illegitimate action is too high a standard with which to hold efforts to set limits on the legitimate exercise of power and authority. Setting and policing standards does not prevent actors from acting; it merely sets a marker against which behaviors can be measured. Laws against illegal entry did not prevent Watergate; they did, however, provide a measure of its illegality. Moreover, justification of decisions often continues long after decisions are made, and the evaluation of that justification continues as an element of civic discourse, as well, sometimes for decades. In domestic settings, parties in power are often held accountable for decisions not at the moment of decision but in the years following, as the consequences of those decisions are made visible and the parties are subject to elections, potential recalls, and other tests of legitimacy. Thus, the question is not entirely whether claims that Iraq possessed no WMD did prevent or could have prevented the U.S. invasion, but also importantly, how knowledge of the extent of those programs has affected the perceived legitimacy of U.S. actions over time.

It can also be said that the IAEA's sources of expert authority were not as strong as they might have been. In this dispute, the IAEA played a role that it had rarely played before, if ever, as a source of public knowledge claims in global civil society. Historically, the agency's tripwire function in signaling violations of the NPT has been designed to serve primarily as knowledge for states and diplomats. The general secrecy of the IAEA's internal knowledge-making processes, designed to protect both the

privacy of information regarding state nuclear programs and the agency's ability to receive and make use of classified intelligence material, meant that the IAEA and its supporters were generally unable to share publicly the background information on which the IAEA's claims were being made.[8] Likewise, although the IAEA has a long-held reputation for technical expertness among knowledgeable insiders, that reputation was largely unknown and untested among broader publics. It is also worth noting that the IAEA never sought to explicitly deny the possibility that Iraq did have WMD that it had succeeded in hiding from the agency. Blix and ElBaradai consistently argued only that they had no evidence of such weapons. As it can in many cases, the characterization of uncertainty associated with this claim ultimately served both to strengthen the agency's expert credibility and yet also to leave the Bush administration sufficient wiggle room to avoid having the legitimacy of its policies undermined to the extent that they became politically untenable.

Finally, one might speculate that the ongoing dispute strengthened the IAEA's authority over time. Persistent skepticism by the Bush administration of the IAEA claims arguably contributed to the IAEA's credibility, as the epistemic contest wore on, as events seemed to vindicate the IAEA's interpretation that the available evidence did not support the position that Iraq possessed WMD. The failure of the U.S. military and inspection teams to find weapons on the ground ultimately led to the identification of administration claims by the U.S. Commission on Weapons of Mass Destruction as a significant intelligence failure. It is also interesting to note that, in its subsequent dispute with Iran over nuclear weapons, the Bush administration has been much more deferential to the IAEA expertise. This evidence is consistent with arguments in the prior section that expert authority is dynamically constituted and that ongoing public testing and skepticism of expert claims by others can contribute significantly to enhancing expert authority.

Kind-Making

Scholars have identified the making of "kinds"—both social and natural—as perhaps the single most important contribution of science to the constitution of modern social order. Through their day-to-day conceptual and practical work, scientists classify and reclassify the subjects and objects of nature and society, carving up the world into distinct ontological types and occasionally creating entirely new taxonomic categories. Many of the central insights of the work of scholars like Michel Foucault, Bruno Latour, and Ian Hacking have focused on the historical construction and normalization of new scientific kinds in social and political discourse: for example, the introduction of "microbes" into late nineteenth-century French culture and civic life (Latour 1988), the differentiation of normal and pathological states of mental health in the nineteenth-century asylum

(Foucault 1973), and the birth of "child abuse" as a category of criminal offense in mid-twentieth-century U.S. law enforcement (Hacking 2002).

Scientific and technological kind-making has been equally important in shaping contemporary international environmental relations. In his classic study of the birth of the term *biodiversity* to describe the sum total of living entities on Earth, David Takacs (1996) articulates the enormous conceptual and political work conducted by conservation biologists to manufacture the "idea of biodiversity" and to persuade others to acknowledge the reality of the concept and to put it to use in structuring international environmental agreements. Stacy VanDeveer (2004) traces a similar process for European environmental politics. He notes that, in European politics, regions like *the Baltic* and *the Mediterranean* have come to serve as important sources of regional environmental identity, comparable in some respects to the idea of nations as imagined communities (Anderson 1991). In analyzing how these regional identities have come to structure environmental policymaking, VanDeveer highlights the historic importance of scientific and technical work in visualizing and operationalizing each as a "natural" geography for collective diplomatic activity. Other evocative work has examined the importance of science and technology to the emergence of the earth and the African elephant as important visual symbols and organizing elements of international environmental cooperation (Jasanoff 2001, 2004c; Thompson 2004).

Building on these arguments, I want to argue, first, that kind-making is a key element in the emerging authority of international institutions to order global spaces and, second, that international knowledge institutions have been important coordinators of scientific kind-making in global society. An important feature of globalization is the emergence of *globalism*—the explicit framing of policy issues as being capable of identification, analysis, and management on scales no smaller than the planet as a whole (Miller 2004a). Recognition of the existence of new global kinds, such as the *ozone layer*, the *Earth's climate system*, or *global financial markets*, is an essential feature of globalism and underpins the authority of claims that the management, regulation, or preservation of these systems requires worldwide cooperation. Often, such kinds are referred to as global public goods, common concerns of humankind, or the common heritage of humankind, furthering strengthening the idea that, without global cooperation, something precious may be lost (see, e.g., World Commission on Environment and Development 1987).

The idea that a global public good exists can be a powerful motivator of state behavior. There is perhaps no better example of this than climate change. Over the course of two decades, from the mid-1980s to the mid-2000s, scientists and other advocates persuaded the global community not only of the existence of a new global kind—the climate system—but also that threats to that system demanded concerted, worldwide cooperation and the creation of a major new suite of international institutions. In 1992, over 150 countries signed the UN Framework Convention on Climate

Change on the grounds that global controls on greenhouse gas emissions were necessary to protect the integrity of the earth's climate system. Since 1992, few governments have proven willing to appear opposed to taking action to protect what appeared as a major risk to the global environment. Nearly every government is now a signatory of the Framework Convention and a regular participant in climate change meetings, despite the fact that regulating greenhouse gas emissions is expected to prove costly for all but a handful of countries. In 1992, facing a close election, U.S. President George Bush opted to attend the Rio Conference to sign the Framework Convention. Subsequently, in 1997, nations signed a second binding agreement, the Kyoto Protocol, to reduce greenhouse gas emissions. Even though some powerful countries, including the United States, subsequently took stances in opposition to the Kyoto Protocol, Russian accession in 2004 brought the Protocol into force in 2005. Moreover, few nonparticipants are willing to appear completely unconcerned. Thus, even the United States feels it necessary to maintain a public commitment to "an aggressive plan to address climate change" (Eilperin 2004).[9]

Scientific advocates of protecting the global environment could not have succeeded, however, without support from international knowledge institutions. A key institution in this regard has been the IPCC. In 1988, an intergovernmental agreement established the IPCC as the focal point for the development of a formal, policy-relevant statement of the scientific understanding of climate change and the establishment of the necessary legal foundations for a treaty to address global warming. Evolving subsequently into a more explicitly scientific institution, the IPCC played a key role in shoring up credibility for the idea of climate change throughout the 1990s and up to the present.[10] The panel released a series of three major synthetic assessments of climate science, in 1990, 1995, and 2001, each of which claimed increasing certainty regarding the evidence for climate change. IPCC leaders and authors also played important roles in global deliberative processes, leading efforts to persuade policy leaders and publics of the need to take climate change seriously. The IPCC itself became a lightning rod for efforts to create "epistemic chaos" (Adler and Bernstein 2005) regarding the factual basis for climate policy, bearing the brunt of skeptical attacks on the credibility of the organization and its claims, up to and including the attack on the IPCC by the Bush administration in 2001, described earlier.

In establishing the basis of its knowledge claims, the IPCC has, from the outset, focused on kind-making. Scientists involved in the IPCC moved in 1988 to establish and defend a framing of climate change as a global public good and mobilize the weight of international scientific opinion behind this particular epistemic perspective. Up until the 1980s, this framing was deeply disputed. Indeed, the dominant framing of climate change held, up through the 1970s, that climate change should be understood primarily in local terms—not as a global issue—and that, framed in terms of local changes in weather, rainfall, and sea level, climate change neither posed a

global threat nor admitted of a global solution. While not the first to frame climate change as a global issue, the IPCC explicitly challenged the prior, local framing of climate change and mobilized the backing of the international scientific community behind a global framing. Working with climate modelers, the IPCC used its control over the narrative structure of its scientific assessments to boost the credibility of the claim that the Earth's climate system should be treated in international law as an ontologically unitary system that spans the entire globe and, thus, as a common concern of humankind. In so doing, the IPCC helped organize a powerful epistemic community in support of policy action to reduce greenhouse gas emissions and alleviate the risk of "dangerous anthropogenic interference with the climate system"—the language ultimately adopted in 1992 by the Framework Convention.[11]

International knowledge institutions have played equally important, albeit interestingly different, roles in the case of biodiversity conservation. In the 1970s and the 1980s, a number of international treaties were signed to protect endangered species around the globe, especially those that traveled across national borders, either on their own or as part of international trade. Within these treaty regimes, international knowledge institutions were extremely important. The Convention on International Trade in Endangered Species, for example, relied on the International Union for the Conservation of Nature, an international scientific organization of conservation biologists, to delineate lists of endangered and at-risk species whose trade was forbidden by the treaty, much as the U.S. Fish and Wildlife Service lists and delists endangered species in the United States under the Endangered Species Act. Powerful international NGOs involved in global nature conservation activities, like the World Wildlife Fund for Nature and Conservation International, also developed extensive scientific research programs.

In the late 1980s, however, conservation biologists made a significant pitch for reframing conservation policy away from endangered species toward a more holistic and less piecemeal approach. In the process, they coined the term biological diversity, specifically to refer to the idea of all life on earth. The idea that biodiversity losses constituted a global problematic that required new global conservation programs acquired significant attention as a result of the work of these scientists—who formed a new and influential epistemic community during this period (for an account of this community and their work to persuade policy leaders and the public of the idea of biodiversity, see Takacs 1996). Their work led, in 1992, to the signing of the UN Convention on Biological Diversity (CBD) at the Rio Earth Summit in parallel to the Framework Convention on Climate Change.

Conservation biologists ran into serious difficulties, however, when their efforts to define biodiversity as a global kind were heavily criticized as the imposition of Western values on developing countries. During the negotiations, a number of powerful developing countries rejected the idea

that biodiversity should be understood as a global public good or "common heritage of humankind." These countries insisted, instead, that the treaty refer to "sustainable conservation and use of biological resources" by states, and they rejected a program of global priority setting for biodiversity conservation. The resulting language reasserted strong national sovereignty over land and forest resources. During both the treaty negotiations and subsequent meetings of the CBD, the regime has opted not to set global priorities for biodiversity conservation and instead leave priority-setting to individual states within their own borders. Conservations biologists were struck another harsh blow in 1994 when their publication of the Global Biodiversity Assessment, an IPCC-like effort to systematize understanding of biological diversity around the globe, was criticized as politically illegitimate and ultimately disregarded by the evolving CBD process.

Responding to the political failure of the Global Biodiversity Assessment, a number of scientific and conservation organizations reconvened in 2001 to establish a new international knowledge institution devoted to biodiversity: the MA. Like the IPCC, the MA has claimed a global mandate and sought to mobilize international action to protect the environment. The MA has been very careful, however, not to reopen the question of biodiversity as a global public good. Instead, it has approached its knowledge-making activities primarily in a standard-setting mode, working to establish a common approach to ecosystem services assessment that it believes can serve users around the globe. Perhaps more importantly, however, the MA has learned from its predecessors that international knowledge institutions are both subject to political criticism for failing to live up to ideals of broad participation and are at their most effective when they speak broadly to global audiences. A major element of the MA's framework is therefore organized to expanding deliberation and participation in its activities among members of global society, both to shore up its political legitimacy and to engage a wide range of actors in global society. This trend toward expanded deliberation in international knowledge institutions, which is not limited to the MA, is the subject of the next section.

Expanding Deliberation to New Voices

The trend toward increasingly open deliberation in global civil society has emerged as a result of new mechanisms that expand participation in global policy debates beyond the elite diplomatic, policy, and economic communities that have traditionally dominated international relations. Significant aspects of this work have been carried out by the mobilization of antiglobalization protests and NGO forums paralleling major international meetings. In recent years, however, international knowledge institutions have contributed, as well, to opening up new spaces for deliberation in global society. They have done so in two ways. First, their consolidation and

legitimation of particular factual claims as well as new global kinds has lent support to marginal groups seeking to call attention to the significance of their concerns within global policy debates. Second, these institutions have expanded participation within their own knowledge-making processes to a range of marginal groups who have not historically participated in international scientific advisory processes. To date, these contributions remain admittedly limited and exploratory in many respects. Nevertheless, current trends in the organization of international knowledge institutions suggest at least a preliminary recognition of the need to significantly expand the range of voices that participate in the construction and deliberation of epistemic frameworks designed to underpin global policymaking.

Let me begin by returning briefly to debates about Iraqi WMD. Prior to the U.S. decision to invade, discussions regarding the appropriateness of a U.S.-led invasion of Iraq were arguably a more extensive episode of public deliberation than any prior decision in international governance. Public debates preceded the invasion for six months, as the Bush administration sought to make its case for war before the Security Council and in the global media. Many of the Security Council deliberations were themselves made public, especially as tension over the decision grew in January and February 2003. Why did this highly public debate take place, so different, for example, from the very private diplomacy that characterized Bush's father's coalition building prior to the Gulf War? In part, the trend in international settings is toward open and transparent deliberation. Important, too, was staunch opposition from France and Germany, combined with public opinion surveys in the United States that showed that support for the war increased dramatically among Americans if the United States had significant allies and the support of the UN Security Council. Underpinning both were the claims of the IAEA and UNMOVIC. Their consistent refusal to agree to U.S. knowledge claims about the presence of WMD in Iraq lent considerable weight to German and French opposition and to skepticism among Americans, calling into serious question the legitimacy of the administration's position and forcing a public defense.

These events suggest that claims to knowledge have come to have significant impact on standing within international debates. On the one hand, standing in debates is buttressed by strong knowledge claims supporting one's position. Not only did IAEA scientists and officials become central participants in debates by virtue of their claims to knowledge from inspections, but others also acquired new credibility for their positions by appropriating the IAEA's claims in support of their own. At the same time, the persistence of epistemic uncertainty and conflict among powerful knowledge claimants opened up possibilities for wider deliberation than if knowledge claims asserted by powerful actors had gone unchallenged. By calling into question the epistemic grounding for the Bush administration's justification for war, the IAEA knowledge claims helped make it

possible for those critical of the idea of invasion to voice their concerns and be heard in global forums.

Nor is the IAEA the only example of this kind of expansion of deliberation. In environmental affairs, too, international knowledge institutions have created new opportunities for participation in global policymaking by actors who might not otherwise have had the necessary standing to give voice to their concerns. As scientists and experts working with international knowledge institutions have helped to frame problems as explicitly global, they have opened up possibilities for previously marginal communities both to claim identities as stakeholders in global society and to participate in global deliberations. Defining who counts as a citizen for the purposes of international governance, and which groups of citizens are "stakeholders" in particular governance processes, frequently owes a great deal to expert classifications of policy problems (Jasanoff 2004a).

Two examples illustrate this dynamic. In the 1990s, as the IPCC claims regarding the long-term impacts of climate change began to coalesce and acquire credibility, a group of countries in the South Pacific began to organize under the umbrella of the Association of Small Island States (AOSIS). Garnering significant media and diplomatic attention for their dramatic plight (many were threatened with significant land losses and risks of storm surge destruction due to global warming), AOSIS members became "poster children" for dramatic action to reduce climate change. Island nations that had once gone unnoticed in global policymaking, like Tuvalu and Vanuatu, now shared the stage with the United States, the EU, OPEC, and China, as leading voices in the climate debate, and they continue to do so today in meetings of the Kyoto Protocol. Perhaps more importantly, the attention focused by the AOSIS has been institutionalized within the UN bureaucracy, where small island developing states have been singled out as a special category of "at-risk" nations in the ongoing dialogue of the UN Commission on Sustainable Development and within the funding programs of institutions like the Global Environment Facility.

In a similar fashion, since the 1990s, scientific representations of *the Arctic* as a region at risk from global environmental change have become increasingly tied up with claims about the rights of Arctic peoples to a healthy environment (Martello 2004). For over 70 distinct Arctic peoples, both climate change and the transmission of persistent organic pollutants like PCBs and dioxin to the Arctic region pose significant risks. These threats have given rise to a collective movement to organize Arctic voices to speak out about these risks and influence the shape of global policy. The success of this movement is symbolized perhaps most eloquently by the decision of participants in the persistent organic pollutants negotiations to prominently display an Inuit statue at the head of the negotiating table as a reminder of what was at stake in the negotiations. More recently, in 2005, a leader of the Arctic peoples' movement was invited to speak during U.S. Senate hearings on climate change about the risks climate change poses to Arctic peoples.

Another significant success of the Arctic peoples' movement has been its recent partnership with the global change science community to organize the Arctic Climate Impact Assessment (ACIA). This assessment, which was completed in 2005, illustrates the extent to which indigenous groups have begun to acquire salience for international knowledge institutions not only because they inhabit a region at risk, but also because they hold valuable knowledge about those risks in the eyes of global scientists. Established by the International Arctic Science Committee, the ACIA involved Arctic indigenous groups from the outset in a dialogue on the nature of climate change in the Arctic region and its impacts on Arctic peoples, their lives, and livelihoods. Scientists and indigenous groups worked together to identify and document trends in regional climatic changes, the ecological risks they posed to Arctic wildlife, and their long-term implications for Arctic cultural traditions and practices. The resultant assessment documents the visible risks to the Arctic region and its inhabitants posed by climate changes already under way, establishing a powerful new set of knowledge claims justifying global action to reduce emissions of greenhouse gases.

The ACIA exemplifies an important trend among international knowledge institutions to open up participation in their knowledge-making activities to nonscientific groups. Across a range of assessment activities, there is a growing commitment to the idea that citizens as well as experts can provide important contributions to the knowledge base of international governance (see, e.g., Ellis and Waterton 2004). Particularly as international knowledge institutions begin to shift their knowledge-making from an emphasis on global systems to more focused studies of the implications of global change for local ecologies and for human affairs, they seem increasingly enamored of the idea that local communities may have valuable information to share about local ecological processes, local relationships between nature and society, and local needs for knowledge to inform decision making. Opening up participation and deliberation within knowledge-making processes also often shifts more fundamental elements of global knowledge-making, including the framing and definition of problems, as well as the evaluation and weighting of evidence.

Another prominent institution that has confronted these issues is the Millennium Ecosystem Assessment. While the MA was modeled at least in part on the IPCC, as an effort to synthesize scientific knowledge about a key aspect of the global environment, its organization differs significantly from the IPCC. The MA was not organized by governments, in a multilateral framework, but rather emerged out of discussions between a group of NGOs (including, especially, the World Resources Institute), private fund-raising organizations (including the Packard Foundation and the UN Foundation), and multilateral agencies (including the World Bank, UN Environment Program, and the Global Environment Facility). The MA is an independent, multi-sectoral institution, with reporting requirements to

its collective funding agencies and to a board of representatives from private sector, civil society, scientific, and intergovernmental organizations. The result is an institution that is structured explicitly so as to be open to an array of voices that have not traditionally been heard in international knowledge institutions or international governance more generally. Building on these organizational principles, the MA has deliberately sought out active participation from nontraditional participants in assessment work, built a heterogeneous assessment framework that encourages diverse groups to adapt the assessment to their own conceptual frameworks and policy needs, and built a broad and extensive outreach program.

The MA board offers one entry point for new voices. Rather than diplomatic representatives of states, members of the board include representatives of multilateral institutions, civil society organizations, scientific organizations, and business and trade groups. This choice was made to engage sectors of global society in the process of assessment whose involvement organizers saw as essential to achieving sustainable ecological outcomes but that prior international environmental assessments largely failed to involve meaningfully. Half of the members-at-large of the board were chosen to represent organizations in developing countries, and a significant number of the institutional representatives from UN organizations were also selected from developing countries. One board member also represents the Indigenous Peoples Biodiversity Information Network. The result is a governance arrangement that not only better reflects a balance between Northern and Southern perspectives, but also that maps global society very differently than most international governance institutions, sectorally rather than geographically.

In addition, MA leaders have pursued several other, novel initiatives to expand participation in the MA's knowledge-making processes, especially to experts and audiences in developing countries and indigenous communities. Like the IPCC, each working group was co-chaired by a representative from a developing country; unlike the IPCC, however, fully one-third of all authors involved in the assessment came from Asia, Africa, Latin America, and the Caribbean. The MA also made deliberate efforts to create deliberative "user forums" in many developing countries that involve a range of governmental and nongovernmental participants in discussions of the MA findings and their implications for both local and global policy. The MA established and operates over 30 of these "user forums," many of which involved participants in more than one developing country nation. In each user forum, a local host institution was funded to organize and convene a series of open meetings and facilitate an ongoing dialogue about ecosystem change and environmental policy among civil society groups, businesses, and governmental agencies.

Another departure from the IPCC model involves the conduct of what the MA terms sub-global assessments. In what was at the time an unprec-

edented effort among international environmental assessments, the MA developed a strong, bottom-up process for proposing and conducting smaller-scale, more localized assessments in addition to its global assessment. Here, the organization of the MA has implicitly tracked two important aspects of the development of international environmental governance: first, that many elements of environmental degradation around the world are intimately tied up with local processes of social and environmental change and, second, that acting on these linkages between local and global sustainability demands assessment processes that can link effectively with local and regional decision-making processes and institutions. Put differently, the MA has argued, in effect, for the need for a cross-regional approach to assessment and knowledge-making that matches the nested federalism of political structures at different levels of aggregation. These pieces of the larger MA have included as one of their mandates an explicit requirement to engage with local "users" or "decision makers." In an interesting move, several of the sub-global assessments have taken as their partners not governments or other political institutions but communities and individuals whose lives and livelihoods are related to the particular ecosystems and ecological processes of interest to the assessment. In this manner, a variety of individuals and groups around the world, including indigenous groups, residents near a city park, landowners, and others have become, in effect, global citizens, participating in the development and use of knowledge in international governance. In all, roughly 30 sub-global assessments were supported by the MA, accounting for nearly a quarter of its total budget.

Another interesting example involves the MA's new approach to building scenarios of future ecosystem change. As scientific models have become increasingly prominent features of international policymaking, questions about the assumptions on which these models are based have grown in importance. Modelers have responded by appropriating the idea of scenarios from business planning to represent distinct sets of input assumptions that correspond to various possible futures. The IPCC, for example, developed six standard scenarios for use by modelers in characterizing the potential responses of their models to various assumptions about the trajectory of future greenhouse gas emissions. Recognizing, however, that scenarios are as much narrative storylines as they are sets of technical assumptions, the MA scientists consulted a number of "world leaders" in politics, business, religion, and civil society to solicit their views on the potential future of the planet as input to the MA scenario-building process. Equally interestingly, the MA plans to use scenarios as the basis for a series of dramatic performances and other innovative outreach programs designed to engage individuals around the world in discussions of its findings. Recognizing that members of global society, and not just policy officials, constitute an appropriate audience for international expert institutions, the MA is also seeking to find ways to communicate its ideas in forms that are more friendly and open for discussion

than the 1,000-page technical volumes and highly redacted "summaries for policymakers" that have become the standard forms of communication for international scientific assessments. Its goal is to embolden thousands of readers worldwide to become activists for the protection of global ecosystems in their own communities.

One important, if arguably less well-recognized consequence of the MA's commitment to sub-global assessments and scenario building is the potential of these activities to strengthen the capacity of local voices to speak authoritatively not only in their own communities and in MA activities but also in other global forums such as the Convention on Biological Diversity and the Ramsar Wetlands Convention. As governments and global society have turned increasingly to international knowledge institutions to shore up the legitimacy of global decision making, the ability to deploy scientific and other forms of expert reasoning has become increasingly essential to effective participation in international governance. Perhaps inadvertently, the MA has stumbled across a possible opportunity to strengthen the capacity of different parts of the world to connect scientific expertise and policy reasoning in ways that can secure credibility and authority on the global stage.

In each of these ways, the MA has recognized and made accommodation to the fact that global environmental challenges are of deep concern to many within global society whose voices are poorly represented by the government scientists who have traditionally populated international knowledge institutions. Whether such efforts will strengthen the ability of these groups to use knowledge claims to hold accountable powerful global actors remains an open question; developments over the next several years as the MA's knowledge claims begin to circulate in global society and questions about whether its long-term support are addressed may begin to provide an answer. In the meantime, however, it is interesting to note that several other international knowledge institutions have begun to implement innovations that parallel and expand upon those of the MA. I have already mentioned above that the Arctic Climate Impact Assessment has invited the 72 indigenous peoples that inhabit the Arctic to be partners in developing formal knowledge claims about the role of climate change in the region. In another example, the Global International Waters Assessment has decentralized its knowledge-making processes, abandoning a single global organization in favor of hundreds of river-basin scale processes that incorporate diverse participation from a range of governmental, nongovernmental, and private sector experts. As a final example, the World Bank's most recent effort to mobilize science to strengthen global food security has borrowed liberally from the MA's institutional innovations, especially in the inclusion of a broad range of stakeholder groups in its governance and knowledge-making activities. Together, these three recent assessments suggest that the kinds of participatory knowledge processes developed by the MA are becoming increasingly common among new international knowledge institutions.

Conclusion: Knowledge and Democracy

International knowledge institutions have become increasingly important and powerful sources of expert authority in international governance. Particularly with regard to their standard-setting and ontological kind-making work, several such institutions, including the IAEA and the IPCC, have become sources of epistemic frameworks and claims to matters of fact that are increasingly persuasive and able to command credibility in the deliberations of global society. This credibility and authority has been hard won and acquired through dynamic epistemic disputes over the factual basis of global policymaking, placing these institutions in important positions within the increasingly deliberative politics of global society.

This transformation raises a subtle and complex question regarding the extent to which the work of international knowledge institutions offers a potentially valuable approach to placing *democratic* constraints on the exercise of power in global society. Can international knowledge institutions strengthen the ability of a global citizenry to place limits on the legitimate exercise of power in world affairs and so constrain the inappropriate use of coercion by powerful global actors? Would efforts to promote the activities of international knowledge institutions promote the possibility of workable accountability regimes at the global level? Or, by contrast, is the power of international knowledge institutions to define global standards and ontological kinds itself a problem for global democracy?

Historically, an important concern has been that powerful actors frequently deploy science to justify their actions in ways that exclude alternative voices and limit democratic participation in policy choices. Science has a long history of use in buttressing imperial power and authority (Cohn 1996; Storey 1997), and as Brian Wynne has observed, even democratic governments are not exempt from the desire to manipulate science to serve the interests of power: "Power is able to control scientific reason through rituals which lend a rational image to decisions whilst restricting the real scope for rational criticism" (Wynne 1982, 2). Wynne continues: "Those who define the facts also give them political meaning" (3). Nor is there a shortage of critics who have argued that international organizations like the IMF and World Bank have established narrow scientific framings, excluded relevant potential participants and knowledges, and used expert knowledge and authority to justify the imposition of coercive policies in global society (Goldman 2004; Stiglitz 2003). Critics of the IPCC have criticized its lack of developing country participants (Boehmer-Christensen 1994; Kandlikar and Sagar 1999), indigenous peoples, or other global citizens in its knowledge-making processes. Even the IAEA, as I suggested above, has arguably suffered in terms of public credibility and authority as a result of its closed and relatively secretive approach to knowledge creation and validation.

In the wake of these criticisms, it is essential that scholars and participants in international governance recognize that the construction and deployment of policy-relevant knowledge is a significant source of power in global society that needs to be subject to its own democratic critique. As I argued at the beginning of this article, the prospect of democratic reforms of international governance must attend to knowledge-making as well as decision-making processes. And yet, to leave the analysis there would be to miss, I believe, the potentially valuable contributions that international knowledge institutions might be positioned to make—if organized appropriately—to the democratization of world affairs and especially to the possibilities for enhancing deliberation in international governance. In *The Descent of Icarus*, democratic theorist Yaron Ezrahi suggested that democracies had, over the course of the nineteenth and twentieth centuries, found ways to "use scientific knowledge and skills . . . to ideologically defend and legitimate uniquely liberal-democratic modes of public action, of presenting, defending, and criticizing the uses of political power" (Ezrahi 1990, 1). The question is whether, in international contexts, similar achievements can be accomplished as international governance becomes increasingly important in addressing the challenges of globalization in the next quarter century.

I believe that international knowledge institutions have the potential to become proto-democratic experiments in international governance. In making this claim, I am being deliberately careful. Approached from this perspective, international knowledge institutions can be understood as experimental attempts to alter the calculus of power that has long dominated international relations. Through the production and certification of knowledge for use in global policymaking, they offer an opportunity to structure global politics so that it is determined not by the will of the most powerful but rather the outcomes of broad processes of deliberation informed by knowledge and reason. Put differently, these institutions signal the existence of a struggle to deploy scientific knowledge and expertise as the basis for a global civic epistemology—a set of evidence, facts, logics, rationales, and styles of reasoning on which to ground policies that encompass the globe—that emerge out of deliberation rather than exclusion.

To be sure, no such institutions can be expected to fully eliminate the illegitimate exercise of power in global society, and there is a strong need for these institutions to attend carefully to their own knowledge-making processes to ensure that they serve the goals of opening up and facilitating deliberation in global society. Nonetheless, I believe, even in current practice, there are at least three important ways in which international knowledge institutions have contributed and have the potential to continue to contribute to enhancing the possibilities for democratic deliberation beyond the nation-state. The first relates directly to Brian Wynne's (1982) critique cited in the previous paragraphs. Today, in global society, the practice of powerful actors justifying their decisions through ritualistic

reference to matters of fact is ubiquitous and pervasive. In the short term, therefore, prior to the emergence of fully democratic institutions of global governance, there is a need for counterbalancing institutions that can open up the knowledge claims of powerful actors to critical scrutiny and thus make space for deliberative engagement with their policy objectives and actions. This is, in my view, the role played, if only with partial success to date, by the IAEA and the IPCC in their challenges to U.S. policy justifications. Strengthening the commitment of the global community to open dialogue and deliberation about the factual basis of global policies would, I believe, offer an opportunity to strengthen the ability of these institutions to question the policies of powerful states and hold them accountable to global norms of behavior; at the same time, it would also further open up opportunities for critical assessment of these institutions' own knowledge claims.

This brings me to the second way that international knowledge institutions are able to facilitate future democratic deliberation in global society, by opening up their own processes of knowledge-making to a wider array of participants in global society. The practices of the MA and other recent international assessments suggest a greater willingness among international knowledge institutions to open up knowledge-making processes in global society to participants from developing countries and indigenous communities who have traditionally had little voice in knowledge-making or decision-making forums. In so doing, they offer a possibility in the future that tacit assumptions and framings embedded in policy-relevant epistemic frameworks and claims may be more fully opened up to democratic scrutiny. At the same time, participation in the work of these institutions may strengthen the capacity of marginal voices to speak authoritatively in other international governance forums. I want to be careful not to claim too much for the MA's successes in opening up participation. While indigenous communities and developing countries have participated actively in some areas of the MA, for example, they are far from fully equal partners in the MA as a whole. The MA's actions are tentative, initial steps, at best. And yet, by pointing them out, and highlighting their potential democratic significance, I hope to signal to other international knowledge institutions the importance of facilitating global deliberation through an expansion of meaningful participation in knowledge-making exercises in global society.

The third potentially important function of international knowledge institutions may be to put into place rules, procedures, and standards for the democratic production of knowledge claims used to justify global policy decisions—and just as importantly, to serve as sites where such standards can be deliberated, critiqued, and subjected to reform by citizens from around the globe. Broadly accepted norms and procedures for policy-relevant knowledge-production have emerged over the past half-century to characterize individual democratic cultures, sometimes as the result of law, other times through the explicit and tacit choices and prac-

tices of participants in policy processes and the expectations of democratic publics (Jasanoff 2005). Through these standards, democratic publics hold claims-makers accountable for the ways in which knowledge claims are framed, formulated, and validated. These practices often vary dramatically from country to country, however, raising complex questions about how to set such standards in global governance (Miller 2005). International knowledge institutions are perhaps the most prominent place in international governance where such standards are being worked out, and considerably greater attention needs to be paid to ensuring that this process of working out global knowledge standards takes place deliberatively, with broad participation (see, e.g., Miller 2001).

In sum, my argument is meant to encourage international knowledge institutions to recognize that their importance to global society is not so much in just getting the facts right—which tends, too often, to serve as a focal point of their activities—but also in expanding the opportunities for global society to deliberate and debate the epistemic frameworks underlying policy choices made for the world as a whole. After all, scientific ideals just as much as democratic ideals insist on progress not through coercion and arbitrary authority but through persuasion and reasoned dialogue. What is needed next, then, is more of both theoretical inquiry and pragmatic experiments regarding the democratic potentials of international knowledge-making and its use for setting limits on the illegitimate exercise of global power.

How might international knowledge production, validation, and certification be structured in the future to more systematically open up knowledge-making to democratic critique? How might meaningful democratic participation be structured in the future in international knowledge institutions? Whose voices need to be heard and at what point in the process? What investigative powers and practices might future institutions be given to inquire into global affairs? What rules and procedures will they be obliged to follow in constituting knowledge claims? What standards of evidence, proof, and review should govern their operations? And, just as importantly, what constitutional role might these institutions come to play in international governance? What authority might they wield vis-à-vis other actors who populate global society? How much weight and deference should be given to their claims in relation to knowledge claims from other sources?

Only with answers to these more detailed questions in hand will scholars and participants in international governance be positioned to evaluate to what extent international knowledge institutions can contribute in the future to the constitution of an explicitly democratic order in global society.

Notes

1. This decline in legitimacy has been attributed to a range of factors, including the delegation of increasing power and authority to these institutions by

coalitions of states grappling with the challenges of economic globalization (Keohane and Nye 2001), highly publicized policy failures such as the Asian financial crisis in the mid-1990s (Haggard and MacIntyre 1998; Stiglitz 2002), and the reliance of these institutions on expert models that fail to account properly for the politics of development and the need to bring global programs in line with local knowledges and cultures (Escobar 1995; Ferguson 1990; Goldman 2004; Scott 1998).

2. In the growing field of science and technology studies, for example, a number of works have highlighted the extent to which modern democratic politics increasingly takes the form of struggles over the credibility and representation of scientific and other expert knowledge (see, e.g., Epstein 1996; Lee and Roth 2001; Nelkin 1984; Wynne 1982), as well as the growing role of governmental and quasi-governmental institutions in the certification of policy-relevant knowledge (see, e.g., Hilgartner 2000; Jasanoff 1990, 1996). Other works have highlighted the importance of the development of statistical modes of reasoning to the democratic state in its efforts to formulate, evaluate, and justify an array of social welfare and infrastructure policies (see, e.g., Ezrahi 1990; Porter 1995; Rueschemeyer and Skocpol 1996).
3. Arguably, Stiglitz (2002) comes closest in his detailed critique of the epistemic failures of the IMF. Stiglitz's proposals for democratic reform at the IMF, however, fail to offer serious institutional and procedural reforms regarding how the IMF should produce and validate knowledge differently in the future.
4. While this article focuses specifically on institutions whose primary activity is knowledge production and validation, the ideas may be of more general relevance, since nearly all international institutions are involved in some fashion in this activity.
5. Nye (2004) argues, for example, that legitimacy is essential to a state's soft power. Prior to invading Iraq, the Bush administration spent considerable time and effort attempting to justify its decision, emphasizing the brutality of the Hussein regime, the purported evidence indicating Iraqi possession of WMD, the right of the United States to self-defense, and the need for democracy in the Middle East.
6. For nearly two decades, for example, the International Institute for Sustainable Development has sent representatives to a wide range of multilateral environmental negotiations for the purpose of writing summaries of each day's events and discussions and publishing them in the Internet journal *Earth Negotiations Bulletin*.
7. The IAEA safeguards system thus seeks to prevent the necessity of states using violence to eliminate an illicit weapons program, as for example when Israel bombed an Iraqi nuclear facility in 1981.
8. Grant and Keohane (2005) note, for example, that transparency is essential to peer and reputational forms of accountability. My claim here takes that a bit further. Not only is it essential that the knowledge claims on which accountability decisions might be based be widely distributed, if a state's legitimacy is to be called into question, but it is also essential that sufficient foundations be in place to secure the credibility of those claims, either in the form of trust relationships between the knowledge producer and citizen consumers or in the form of additional sources of data and evidence that can be used for verification and cross-checking.
9. In June 2005, the U.S. Senate voted to approve a resolution calling for mandatory limits on greenhouse gases to be established by mid-2006, reversing its 97-0 vote in 1997 prior to the signing of the Kyoto Protocol and establishing clear acknowledgment of the factual reality of climate change within U.S. domestic politics.

10. Miller (2001) offers a full analysis of the transformation of the IPCC into an explicitly scientific institution and the credibility contests that the IPCC has faced (see also Edwards and Schneider 2001).
11. For a full analysis of this transformation of the framing of climate change and the IPCC's role in it, see Miller (2004b) and Edwards (2001).

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