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Nature/Culture Clash: The Transnational Trade in GMOs

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Introduction

This paper aims to offer a fresh perspective into what is at stake in the cross-cultural trade dispute over genetically-modified organisms (GMOs) by subjecting a particular discursive sample, the parties' submissions to the WTO panel, to critical scrutiny. The first step involves a survey of the rhetorical strategies deployed by the parties' in the presentation of their arguments to the Panel. Next, I embark on the task of 'disassembling the double helix'. My use of the term 'double helix' in this analysis refers to the close coupling of scientific and legal discourses in the trade regime: science and law are two parallel strands of discourse wound around each other, each punctuated at intervals by key binding sites where linkages between the strands are anchored. The image I aim to conjure up is, of course, the one made famous by Watson & Crick's 1953 discovery of the structure of deoxyribonucleic acid (DNA), "the molecule that genes are made of".[1] A discovery which has led, inevitably, to the advances in molecular biology that give rise to the technologies so contested in their current application to the task of 'improving' food. This work attempts to unfurl that twisted ladder and peel apart the strands of scientific and legal discourse that are coiled together in the 'double helix' of international trade law dealing with environmental and health risks. The aim is to gain some clarity from the disentanglement: it is hoped that teasing the scientific from the legal discourses will expose the implicit assumptions at play when international trade tribunals turn to scientific assessment as the means of separating the legitimate from the protectionist in disputes over contested technologies.

The conflict under the rhetorical microscope in this study is the most recent, and controversial, transnational 'food fight' between the United States (U.S.), Canada, and Argentina, on one hand, and the European Communities (EC), on the other.[2] Certain aspects of the European scheme for regulating

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* Inspiration for this title was drawn from Goodman, Heath and Lindee, for whom "nature/culture" is the "labyrinthine intermingling of realms that calls into question both categories", *infra* note 46 at 5.

[1] This phrase appears in the First Submission of the United States at para.13, *infra* note 66.

[2] The high profile '*Beef Hormones*' dispute, which began formally before the WTO in the late 1990s and continues to simmer, was the first of these transnational food fights. It pitted the U.S. and Canada against the EC in a similar battle that, at its core, involved common questions of technology use in agriculture, confidence in regulatory science, and the legitimacy of the WTO to impinge on national sovereignty in situations where regulations are

GMOs, both as crops and in foods, in the minds of the complainants on the other side of the Atlantic, constitute unjustifiable barriers to trade. A three-person panel of trade law experts has been appointed by the WTO to adjudicate the complaints ("the Panel").[3]

By engaging in this very close reading of the parties' submissions to the Panel, my gaze is focused on the strategies by which those submissions are constructed so as to produce descriptions or accounts that will be treated as "factual" by the Panel. How are claims made to appear neutral and stable, independent and separate from the parties' interests? How are conclusions made to appear necessary or logical? How are particular arguments sustained with respect to both the necessary scientific 'facts' and the legal tests? In particular, I explore the extent to which the parties mobilize systems of oppositions in their rhetorical battle to convince the Panel that their interpretation of how law should handle trade in GMOs is the correct interpretation.

"Scientific disputes", it has been shown, "are not resolved simply by reference to scientific 'facts', but by the adoption of rhetorical strategies that weave together ideological elements in a manner designed to shape public discourse and gain legitimation".[4] A key strategy for the parties is that of 'categorizing the claims-maker'. The status of knowledge claims about GMOs is tied closely to the authority or credibility that can be assigned to the actor forwarding the claim.[5] Thus careful attention is paid to the parties' choice

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based less on science than on public perceptions, but where a protectionist motive is not proven (*European Communities – Measures Concerning Meat and Meat Products (Hormones*), WTO Doc WT/DS26/AB/R, WT/DS48/AB/R, AB-2000-11 (2001). See Joanne Scott, "On Kith and Kine (and Crustaceans): Trade and Environment in the EU and WTO", in J.H.H. Weiler (ed.) The EU, the WTO, and NAFTA: Towards a Common Law of International Trade? (Oxford: Oxford University Press, 2000) 125.

[3] *European Communities - Measures Affecting the Approval and Marketing of Biotech Products*, WTO Doc DS291, DS292, DS293 (2004) ("*Biotech Products*"). The parties filed their submissions in May 2004, and the first oral hearing was held in June of that year. The Panel initially estimated that it would issue its final report to the parties by the end of September 2004. Subsequent delay was said to be "due to the parties' common request for additional time to prepare their rebuttals as well as the Panel's decision to seek scientific and technical expert advice pursuant to Article 11 of the Agreement on Sanitary and Phytosanitary Measures and Article 13 of the DSU" (Communication from the Chairman of the Panel, 18 August 2004). The Chairman of the Panel released a communication on June 15, 2005 indicating that the Panel had again encountered some delays due to the fact that new issues had been raised by the parties, the matter is "particularly intricate" and the "experts process" had generated "vast amounts" of material to be reviewed. The Panel stated its intention to issue its report by the end of October 2005 (Communication from the Chairman of the Panel, 15 June 2005). Another recent communication, however, now predicts that the Panel's report will not be released until January 2006. Of course, the Panel decision is also likely to be followed by an appeal on points of law to the Appellate Body of the WTO.

[4] Patrick O'Mahony & Tracey Skillington, "Constructing Difference: Discourse Coalitions on Biotechnology in the Press" in Patrick O'Mahony (ed.) *Nature, Risk and Responsibility: Discourses of Biotechnology* (New York: Routledge, 1999) 100 at 100.

[5] For interesting work on the credibility of actors forwarding scientific claims in the context of politically-charged policy, see Steven Epstein, *Impure Science; AIDS, activism, and the politics of knowledge* (Berkeley: University of California Press, 1996).

of sources when they are making scientific knowledge claims. The stakes are high in this struggle, of course, because the trade tribunal is a context in which "categorization is consequential".[6]

The "nomenclature"[7] of transnational trade conflicts over environmental and health protection measures now inevitably includes within its set of specialized terms and symbols "risk", "uncertainty" and "precaution". In fact, I argue in this work that these concepts have become key binding sites for the channels of communication that flow between the strands of discourse, scientific and legal, that constitute the double helix of international trade law. Deconstruction of the parties' submissions also reveals competing conceptions of nature and competing roles for culture in the regime of liberalized trade. This paper concludes by exploring some of the "rhetorical-ideological tasks" that *nature* is called upon to perform.[8] I conclude that, while we are becoming familiar with the WTO as a place where "rival renderings of nature" are forced to "confront each other … packaged in the idioms of legal discourse"[9], the GMO dispute raises original and important questions about the role for *culture* in the science-based trade disciplines of the WTO.

Methodology[10]

Science and law treated as parallel authoritative discourses defined in terms of the techniques they employ in the pursuit of truth.[11] Accordingly, I employ discourse analysis: critical study of the details of language and of processes of rationalization and justification.[12] The aim is to reveal the "preconstructions,

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[6] Jonathan Potter, *Representing Reality* (Thousand Oaks, CA: Sage, 1996).

[7] J.H.H. Weiler, "The Rule of Lawyers and the Ethos of Diplomats: Reflections on the Internal and External Legitimacy of WTO Dispute Settlement." Harvard Jean Monnet Working Paper No. 9/00, Cambridge, MA (2001). http://www.jeanmonnetprogram.org/papers/00/000901.html.

[8] David Delaney, *Law & Nature* (Cambridge: Cambridge University Press, 2001) at 78.

[9] *Ibid.* at 95.

[10] I would like to acknowledge Yair Sagy, whose presentation on the methodology of structuralist and post-structuralist strategies of discourse analysis in the JSD Forum at the NYU School of Law was important to the development of my thinking on this project. A discursive analysis of law, as Sagy emphasized, is necessarily only a partial analysis. Thus, what I mean to provide with this work is simply an alternative lens for thinking about the issues, including the legal issues, raised by this case.

[11] My perspective has been informed by the work of my dissertation supervisor, Liora Salter, *Mandated Science: Science and Scientists in the Making of* Standards (Dordrecht: Kluwer Academic Publishers, 1988) as well as the work of Brian Wynne, "Uncertainty and Environmental Learning - Reconceiving Science and Policy in the Preventive Paradigm" (1992) 2 Global Environmental Change-Human and Policy Dimensions 111 and "Uncertainty - Technical and Social" in H. Brooks & C. L. Cooper, ed., Science for Public Policy (Oxford: Pergamon Press, 1987) 95; and Sheila Jasanoff, The Fifth Branch: Science Advisors as Policymakers (Cambridge, MA: Harvard University Press, 1989) and "Citizens at Risk: Cultures of Modernity in the U.S. and EU" (2002) 11 Science as Culture 363.

[12] In applying this method to legal discourse, I am aware that I necessarily oppose the dominant view of legal language. This view, as described by Peter Goodrich, sees legal language as "a discrete and unitary genre of written

preferred meanings, rhetorical and ideological dimensions" of both the 'scientific' and the 'legal' within the institution of global trade.[13] I adopt a somewhat flexible approach to discourse analysis, simultaneously deconstructing both the semantics of the text and the discursive strategies of the actors.[14] The broad theoretical framework of discourse analysis focuses attention on the constructive and functional dimensions of discourse, and relies on the analysts' eye for "patterns of consistency and variation".[15] Specifically, what I look for is variability and consistency in what is said (and perhaps what is not said), and the appearance of any 'repertoires' or 'narratives' that may betray important themes.

I work from a large but limited sample of data.[16] Legal discourse, particularly in the form of pleadings to a dispute settlement body, falls somewhere between 'naturally-occurring' talk and interview data. The discursive sample, here, is not 'forced' in the sense that interviewees are directed in particular directions by the analyst, but it is not free-flowing either, because it is necessarily constrained by the nature of the proceeding it aims to influence. Importantly, however, except for its purposeful embedding of scientific discourse within the legal argument[17], it is not constrained with respect to the practices I read it to observe: that is, in terms of its use of the concepts of 'risk', 'uncertainty' and 'precaution' or its deployment of 'nature' as a rhetorical tool. Thus the discourse is not self-conscious in the sense that it would be if the parties were interviewed for that particular purpose.

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authorities constituting a grammar or code, which, if correctly attributed and interpreted, forms a series of necessary truths" (at 205). The alternative, which approaches legal discourse as necessarily oppositional and contingent, seeks to uncover the social and political commitments which legal discourse systematically seeks to deny and obscure (at 206). Peter Goodrich, *Legal Discourse: Studies in Linguistics, Rhetoric and Legal Analysis* (New York: St. Martins Press, 1987).

[13] *Ibid.* at 204.

[14] This approach is adopted by T.A. van Dijk (ed.) *Discourse and Communication: New Approaches to the Analysis of Mass Media Discourse and Communication* (Berlin: de Gryter, 1985).

[15] Jonathan Potter & Margaret Wetherell, *Discourse and social psychology: Beyond attitudes and behaviour* (London: Sage, 1987) at 169.

[16] Both Canada's and the EC's First Written Submissions are over 200 pages long. The U.S. First Submission is 64 pages. I also examined Canada's Reply Submission, and three Amicus Briefs around 30 pages each. The submissions of Argentina have not been made officially publicly available and numerous efforts on my part to obtain them from Embassy sources and trade representatives were unsuccessful. "Courtesy translations" of Argentina's submissions are available online, however, on the website of one of the amicus groups, Genewatch UK, and these have been examined as well. Genewatch UK, "WTO Submissions", online: <http://www.genewatch.org/WTO/WTO_Submissions.htm>.

[17] As will be explored in more detail in Parts III and IV, the very structure of the WTO agreements, particularly the *Sanitary and Phytosanitary Agreement***,** when combined with the recent jurisprudence, imposes constraints on the submissions of the parties, in particular it creates an incentive for the complainants to embed scientific justifications into their arguments.

Nevertheless, what I enter is a unique discursive arena.[18] I focus initially on the arguments as presented by the parties, drawing exclusively on their own submissions to the Panel. Eventually, in order to examine the broader themes and issues raised by this dispute, I draw in the submissions of the *amicae*. Like all persuasive texts, these submissions apply familiar rhetorical techniques: they try to anticipate their opponents objections and "demolish them in advance"; they frame problems in particular ways "intended to direct the reader down specific logical channels, while blocking off others"; they present evidence with careful attention to the categorization of its sources; and they deftly manage 'dilemmas of stake' (maneuvering through the webs of interests at play).[19]

In its most general sense, discourse is the process in which knowledge is constituted through communication.[20] Here, however, the term is employed in a more specific sense. When making reference to a "discourse", I am speaking about a "particular *mode* of communication; a field characterized by its own linguistic conventions, which both draws on and generates a distinctive way of understanding the world".[21] Thus, in this sense, scientific discourse differs from legal discourse in interesting and illuminating ways. Each realm of knowledge is based on specific types of observations and subject to particular forms of testing which are reflected in the discourse and in the parties' reasons for deploying one type over the other. In this context, a reliance on scientific or legal discourse in particular instances is deliberate: "[e]ach discourse allows certain things to be said, thought, and done and impedes or prevents other things from being said, thought, and done".[22] The way that science and law "clash, compete and collide" [23] in this case is consequential: "[d]iscourses have real effects; they are not just the way that social issues get talked and thought about".[24] They affect the way issues are decided.

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[18] I am not aware of any other study that has undertaken a discourse analysis of submissions to a trade tribunal. I did, however, draw some inspiration from David Mercer's 2002 study of the submissions to a public inquiry on the health impacts of exposure to electromagnetic fields in Australia: David Mercer, "Scientific Method Discourses in the Construction of 'EMF' Science: Interests, Resources and Rhetoric in Submissions to a Public Inquiry" (2002) 32 *Social Studies of Science* 205.

[19] Steven Hilgartner, *Science on Stage: Expert Advice as Public Drama* (Stanford, CA: Stanford University Press, 2000) at 9.

[20] Norman Fairclough, *Discourse and social change* (Polity Press, Cambridge, 1992).

[21] Kay Milton, *Environmentalism and cultural theory: exploring the role of anthropology in environmental discourse* (New York; Routledge, 1996) at 167.

[22] Alan Hunt & Gary Wickham, *Foucault and Law: Towards a Sociology of Law as Governance* (London: Pluto Press, 1994) at 8.

[23] *Ibid.* at 9.

[24] *Ibid.* at 8.

And the way in which this dispute is decided is a matter of global public interest. That this case is 'watched', and its resolution highly anticipated, is evidenced by the fact that fifteen nations have registered their interest as third parties,[25] several *amicus* briefs have been filed,[26] intense academic attention is devoted to its study, and an unprecedented level of public transparency surrounds the parties' submissions. [27] According to Jacqueline Peel et al., at stake is "not only the multi-billion dollar agricultural gene technology industry, but also (depending on who you listen to) the viability of organic farming practices, future food security in developing countries, agricultural sustainability, global biodiversity, long-term human health, and national regulatory autonomy regarding health and environmental concerns".[28] Finally, the legitimacy of the WTO itself is said to be on the line. For example, several academics who submitted an *amicus* brief emphasize that the very legitimacy of the WTO is threatened precisely because the case is seen as a test of whether the supranational institution is flexible enough to accommodate national particularities, or *differences* in regulatory styles and in risk tolerances, essentially, in the contextual contingencies of culture and place.[29]

This paper consists of three parts. I begin with a brief introduction to the dispute and how it came to be heard before the WTO. Next, in my exploration of the rhetoric of pleadings, I deconstruct the parties' submissions to the Panel beginning with the complainants and then turning to the EC's defence. In the third part, I attempt to disassemble the 'double helix' of scientific and legal discourses, unfurling the tight coil wound up by the recent WTO jurisprudence in the science-based trade disciplines. In this section, I

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[25] Australia, Brazil, Chile, China, Chinese Taipei, Colombia, El Salvador, Honduras, Mexico, New Zealand, Norway, Paraguay, Peru, Thailand and Uruguay have registered their interest in the disputes as third parties affected by the outcome.

[26] The WTO dispute settlement bodies have the discretion to accept and consider unsolicited *amicus* curiae briefs (*United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WTO Doc WT/DS58/AB/R (1998) (Report of the Appellate Body). At least three "non-state actors" have filed amicus briefs before the WTO: a global coalition of 15 public interest groups with representation from all parties (WTO Doc WT/DS291, WT/DS292, WT/DS293 (2004) (*Public Interest Amicus*); a group of five 'environmental' organizations, including the Center for International Environmental Law (CIEL), Friends of the Earth – United States (FOE), Defenders of Wildlife, Institute for Agriculture and Trade Policy, and the Organic Consumers Association – United States) (WTO Doc WT/DS291, WT/DS292, WT/DS293 (2004) (*Environmentalist Amicus*); and a group of five 'expert academics' from both the UK and the U.S. (Lawrence Busch, Robin Grove-White, Sheila Jasanoff, David Winickoff and Brian Wynne),(WTO Doc WT/DS291, WT/DS292, WT/DS293 (2004) (*Academic Amicus*).

[27] Jacqueline Peel, Rebecca Nelson, and Lee Godden, "GMO Trade Wars: The Submissions in the U.S.-EC Biotech Dispute in the WTO", Draft Working Paper presented in the NYU Colloquium *Globalization and its Discontents*, March 30, 2005 (noting that in the "short history of dispute settlement in the WTO, few cases have excited as much anxious anticipation".) Peel *et al* also argue that the "intense public interest" in the dispute is responsible for the "unprecedented level of transparency regarding their arguments and submissions to the WTO" (at 2-3). Nevertheless, as mentioned, the submissions of Argentina still have not been made publicly available.

[28] Peel *et al*, *ibid.* at 2.

[29] *Academic Amicus* Brief, *supra* note 26.

explore the concepts of "risk", "uncertainty" and "precaution" that increasingly characterize and polarize risk controversies in the transnational realm.

PART 1: A Brief Introduction to the Case

Developments in the early nineties betrayed no signs of the ferocious food fight that would eventually unfold. Innovation in biotechnology was proceeding in Europe according to largely the same principles as it was in Canada and the U.S.. Between 1991 and 1998, for example, the EC approved the marketing of 18 GMOs.[30] In this 'first generation' of regulation, the EC aimed for a "high level" of protection with respect to health and the environment, but it followed the case-by-case style of assessment that was the backbone of the regulatory regimes in the big GM producing nations.[31] Beginning in October 1998, however, with 12 applications pending, the EC stopped issuing approvals. On top of this, some EC member states invoked a safeguard clause to temporarily ban certain GM food products from their markets.

The EC argues that increasing scientific concern regarding the risks of GMOs gave rise to growing consumer unease and international regulatory developments such as the conclusion of the *Cartagena Protocol*. In response to these pressures, the EC states that it undertook to review its legislation on GMOs between 1998 and 2001. A new "farm-to-fork" regulatory framework was put in place in 2001 and became operational at the end of 2002.[32] The "moratorium" was formally lifted in October 2002 with a new directive designed to update and strengthen the process for assessing whether a GMO posed a risk to human health. The EC also is currently in the process of implementing extensive legislation dealing with the marketing and sale of GM foods, including traceability and labeling requirements.[33] As for the bans, the EU member states imposing them have stated that they will remain in place until the new labelling and traceability rules are in effect.

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[30] EC Submission, *infra* note 92 at para.155.

[31] Council Directive 90/220/EEC adopted in April 1990 governed the deliberate release of GMOs into the environment and regulated their placement onto the market (hereinafter "Directive 90/220"). In 1997, the EC added another layer, Council Regulation 258/97 which served to streamline the approval of 'novel foods' that could be judged "substantially equivalent" to conventional foods. The concept of substantial equivalence is central to the regulation of GMOs in the complaining party states.

[32] Council Directive 2001/18/EC repealed the earlier Directive and instituted a more detailed set of principles to guide environmental risk assessment, as well as provisions for post-marketing surveillance.

[33] To avoid the 'contamination' of non-GM food with GMOs, the EU sets a 1% minimum threshold for unintended GM content, above which labeling is mandatory. The proposed new labeling rules would lower this threshold to 0.9% for approved GMOs and set a threshold of 0.5% for unapproved GMOs. In order to enforce the labeling requirements, the EC also adopted procedures for the traceability of GMOs. These "farm-to-fork" proposals require all handlers of food throughout the production-to-market chain to document the source of GMOs.

Not surprisingly, the 'Big Three' GM food-producing countries have criticized the EC's "precautionary approach". The complainants, U.S., Argentina, and Canada, account for about 99% of the total world production of GM foods.[34] Thus, these countries have a significant commercial incentive to promote the acceptance of GM foods and to oppose any regulations they perceive as barriers to trade. U.S. GM food producers have blasted the latest EC proposals, insisting they are "confusing, misleading, unnecessary, unenforceable, discriminatory, and open to fraud" - in other words, a cover for trade protectionism.[35] Faced with intense pressure from their domestic farm lobbies, the complainants requested the initiation of dispute settlement proceedings against the EC in the WTO in 2003.[36]

The U.S. case rests largely on its characterization of the EC regulatory scheme as "phytosanitary measures". The *Agreement on Sanitary and Phyotosanitary Measures* ("the *SPS Agreement*") is an agreement of the WTO which covers trade-restrictive measures put in place by Members to protect against risks to human, plant or animal life or health.[37] Canada, however, also makes arguments under other WTO agreements, such as the *General Agreement on Tariffs and Trade (GATT 1994)* and the *Technical Barriers to Trade Agreement* (the "*TBT Agreement*). The EC resists the argument that its regime can be judged strictly in light of international trade agreements alone.

PART II: The Rhetoric of Pleading

THE COMPLAINT

First Written Submission of Canada

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[34] Peter W. B. Phillips & W. A. Kerr, "Alternative Paradigms: The WTO versus the Biosafety Protocol for Trade in Genetically Modified Organisms" (2000) 34 *Journal of World Trade* 63. GM food sales are forecast to reach U.S.$8 billion by 2005 and U.S.$25 billion by 2010.

[35] G. Yerkey, "U.S. Looking to Ask EU for Talks in WTO over Ban on Imports of GMO Food Products'", WTO Reporter (22 October 2002).

[36] Request for Consultations by the United States, *Biotech Products*, WT/DS291/1, 20 May 2003; Request for Consultations by Canada, *Biotech Products*, WT/DS292/1, 20 May 2003; Request for Consultations by Argentina, *Biotech Products*, WT/DS293/1, 21 May 2003. When these consultations failed to resolve the dispute, the U.S. requested the establishment of a panel, *Biotech Products*, WTO Doc WT/DS291/23 (2003). See also Gregory C. Shaffer & Mark A. Pollack, "Regulating Between National Fears and Global Disciplines: Agricultural Biotechnology in the EU" (2004) Jean Monnet Working Paper Series edited by J.H.H. Weiler, New York University School of Law at 27 (for the argument that the farm and biotech lobbies pressured the U.S. to bring the challenge).

[37] Agreement on the Application of Sanitary and Phytosanitary Measures, April 15, 1994, WTO Agreement, Annex 1A, *at* http://www.wto.org/english/docs_e/legal_e/final_e.htm [*SPS Agreement*].

In its First Written Submission to the WTO Panel, Canada takes the following basic position: since there is nothing *inherently* risky about transgenic organisms, each new product should be assessed on a case-by-case basis. The submission stresses that the EC suspension of the approval process, the "*de facto* moratorium", is a failure to assess the risks of products to health and the environment on a case-by-case basis, and thus is a violation of international trade rules. Canada makes five key discursive moves.

First, the Canadian submission works immediately to erect boundaries around the legitimate issues for debate. Wasting no time, in paragraph 2 of 508 paragraphs, Canada brings the focus directly onto the "assessment of risks to human health and the environment".[38] This is a strategy of containment. In framing the problem in these terms, certain questions are bracketed off. Canada's narrative goes like this: 'biotech products' must be approved to be marketed in the EC, the approval process involves the assessment of risks to health and the environment (and, by implication, *only* risks to health and the environment). Therefore, this dispute is about the EC's failure to assess risks to human health and the environment. In taking this tack, Canada is already constructing a boundary around the dispute – it is saying "this case is about safety". Not culture, not ethics, not morality, and definitely not sovereignty.

Second, Canada stresses the importance of putting "modern biotechnology in its historical and scientific context".[39] In its first substantive section of argument, Canada puts a premium on context; however, as I will uncover, it is only a specific type of context that favours Canada's position. Canada seeks to focus the discussion on the *comparison* between two types of risk: those presented by modern biotechnology and those presented by conventional plant breeding techniques.[40]

Canada is not making a claim of safety with respect to its 'biotech products', it is simply emphasizing that conventional breeding techniques are similarly risky. For example, it points to an OECD task force which concludes that the potential risks associated with foods derived from biotechnology "are *not inherently different* from the risks associated with conventional foods".[41] Next, it refers to a joint FAO/WHO expert

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[38] *First Written Submission of Canada, Biotech Products,* DS192, April 21, 2004.

[39] *Ibid.* at para.9. In Canada's submission, "the terms "modern biotechnology" and "transgenics" refer to recombinant DNA techniques", otherwise known as genetic modification.

[40] The comparison strategy is important because the issue of *baseline* is recurring and contested: what will the risks of GMOs be judged relative to? Canada tells the Panel to bear in mind that modern agriculture does not occur in a natural environment, but in a "highly controlled system". Similarly, Canada wants the panel to judge the risks of adverse effects on non-target species presented by plants genetically-modified with insect tolerance "in relation to those of the conventional insecticides that these crops are intended to replace". It is a reminder to the Panel: intensive agriculture is not on trial. It is not GM crops versus the unadulterated English countryside, it is the risks of GMOs *relative* to the risks of conventional crops grown by industrial agriculture that you must keep in mind.

[41] *Supra* note 38 at para.11.

consultation report in 1996 that characterizes the two types of risk as "*of the same nature*".[42] This strategy is an example of what Les Levidow & Susan Carr have called "normalizing novelty".[43] The task is to transform 'the novel' into 'the routine'. As the storyline goes, risk is an inevitable part of life and of progress. Relatively speaking, the risks associated with 'modern biotechnology' are minimal and manageable.

Canada's submission continues, for example, to list the risks associated with "genetic modification, *whether by transgenic or conventional means*".[44] The message is that these risks are *not new*; they are ordinary, they are routine. Canada seeks to explain to the Panel members that these risks are simply part-and-parcel of what we deal with in the day-to-day of providing food for your table. The line of argument emphasizes that the "supposed risks of transgenesis are rarely compared with the 'ordinary' risks stemming from modern agriculture".[45] Thus, Canada works to place the focus on the *historical context* of technological advances in agriculture, even while it works to exclude the *social context* of regulating GMOs in Europe.

Third, presumably in anticipation of its opponent's rhetoric, Canada spins the "controlling nature" argument on its head. Canada knows the critique of biotechnology that is gaining purchase with the transnational anti-globalization movement.[46] These activists "often appeal to a type of genetic naturalism that condemns human beings for disrupting a static, pristine nature".[47] The "Frankenfoods" mantra feeds on the image of bad things happening when you "mess with Mother Nature".[48] Thus, Canada's next

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[42] *Ibid.*

[43] Les Levidow & Susan Carr, "Normalizing Novelty: Regulating Biotechnological Risk at the U.S. EPA", (2000) 11 *Risk: Health, Safety & Environment* 9.

[44] *Supra* note 38 at para.12.

[45] Canada quotes the Commission Directorate General for Research, *ibid.*, at para.16

[46] For a rich description of the diverse global movement against biotechnology, see Chaia Heller & Arturo Escobar, "From Pure Genes to GMOs: Transnationalized Gene Landscapes in the Biodiversity and Transgenic Food Networks" in Goodman, Heath & Lindee (eds.) *Genetic Nature/Culture: Anthropology and Science Beyond the Two-Culture Divide* (Berkeley and Los Angeles: University of California Press, 2003) 155. The movement is made up of peasant farmers, indigenous peoples, consumers and ecology groups "[d]rawing linkages between food, land, bodily sovereignty, cultural autonomy, and identity" in protest against the "biological and cultural homogenization" associated with GMOs and fast-food.

[47] Heller & Escobar , *ibid.*, at 157.

[48] 'Messing with Mother Nature", An Interview with David Suzuki, online: http://www.newtimes.org /issue/0305/suzuki.htm.

maneuver is an example of what is often called "offensive rhetoric".[49] It appropriates the narrative of controlling nature with the sole intention of undermining the anticipated opposing description.[50]

Canada explains that both conventional breeding and transgenic techniques can result in "unintended effects".[51] It states that "[i]n achieving the objective of conferring a specific target trait (intended effect) to the host organism by insertion of defined DNA sequences, additional traits could, theoretically, be acquired or existing traits lost (unintended effects)."[52] Canada calls this "an inherent and general phenomenon". But the next move takes it one further:

> One of the advantages of transgenic techniques is the ability to limit genetic changes in the resulting plant and, therefore, reduce the likelihood of unintended consequence. Because transgenic modification permits scientists to transfer selected genes with well-known traits, there is theoretically *less* risk that the resulting organism will exhibit unintended or undesirable traits.[53]

The idea here is that "controlling nature" is actually a good thing. It will render (re)production *more productive*. It will bring predictability to (re)production. Thus, the use of transgenic techniques is portrayed as a simple *improvement* on conventional techniques.

"Gene talk" is becoming ubiquitous in modern society. It reflects an increasing willingness to turn to 'genes', the "building blocks of life", for answers to medical, agricultural, environmental and social problems.[54] This discourse seeks to recast biology in engineering terms.[55] There is talk of *enhanced traits* in organisms and their progeny that come about through *modifications* to their genetic *blueprints*.[56] The result is a tamed, docile and productive nature. It is feat of engineering, analogous to rendering a raging river into a quiet canal. An example of this strategy is also found in the U.S. submission:

> Modern biotechnology continues the trend in developing ever more precise and effective methods for improving *the productivity and functionality* of plants, animals and microorganisms. Over the

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[49] According to Jonathan Potter, accounts and descriptions can have both an offensive and a defensive rhetoric, *supra* note 6 at 107.

[50] *Ibid*.

[51] *Supra* note 38 at para.13.

[52] *Ibid.*

[53] *Ibid*.

[54] Dorothy Nelkin & M. Susan Lindee, *The DNA Mystique: The Gene as a Cultural Icon* (New York: W.H. Freeman and Company, 1995).

[55] Peter Andree makes this observation with respect to the domestic regulation of biotechnology in Canada: Andree, "The Biopolitics of Genetically Modified Organisms in Canada" (2002) *Journal of Canadian Studies* 162 at 168.

[56] *Ibid.*

> centuries, plants have been genetically engineered through, among other methods, selective breeding, grafting, crossbreeding, induced mutation, and tissue culture. Modern biotechnology, or recombinant DNA technology, is the *latest technique* in genetic modification to have been developed and applied to crop plants.[57]

That an object is 'knowable', in this narrative, means that the object is manipulable.[58] Thus, controlling nature becomes "improving nature", and Frankenfoods become "functional foods".

Fourth, a key move made by Canada is in its strategic choice of scientific sources. Canada knows that the best way to avoid the insinuation that 'their science' reflects 'their interests' is to deploy their opponents' science. Reliance on EC sources is a move in the "stakes" game. It is a strategy that exclaims: "it's not just us saying this – it's *their own* scientists too".[59]

In 'categorizing the claims-maker', Canada is attempting to transform the 'speaker' from an interested Canadian making arguments, to a disinterested scientist describing reality. The categorization "has the effect of re-situating (or re-contextualizing) the [claims] by tying them to the circumstances of their production".[60] The disinterested scientist tests knowledge through the systematic application of scientific methods – repetition, validation, replication. Assignment of membership to the category of disinterested scientists thus serves to upgrade the credibility and persuasiveness of the speakers' statements.[61] For example, Canada relies on a quote by the EC's "own" Health and Consumer Protection Directorate-General which recognizes that "breeding techniques in general produce genetic changes in plants". Canada goes on to submit that "the Commission has stated that *its own research* has confirmed that GMOs so far developed and marketed in the EC, following the usual risk assessment procedures, have not

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[57] *Supra* note 38 at para.11.

[58] Paul Rabinow states that the new genetics seeks to know an object "in such as way that it can be changed": Rabinow, "Artificiality and Enlightenment: from socio-biology to biosociality" in *Essays on the Anthropology of Reason,* (Princeton: Princeton University Press, 1996) at 93.

[59] The U.S. submission also employs the same tactic: "In this case, the EC can present no scientific basis for a moratorium on biotech approvals. In fact, many of the products caught up in the EC moratorium have been positively assessed by the EC's own scientific committees". (U.S. Submission, *infra* note 66 at para.86).

[60] Steve Woolgar, "What is the Analysis of Scientific Rhetoric For? A Comment on the Possible Convergence Between Rhetorical Analysis and Social Studies of Science" (1989) 14 *Science, Technology and Human Values* 47 at 48. As Delaney explains, much of the legitimacy and authority of scientific claims derives directly from the conditions of their production, in particular through adherence to strict "methodological canons of inquiry", "procedural regularity and repetition and through the interplay of observation, theory construction, and the free circulation of claims within the community…" He states: "to the extent that the practice of natural science is commonly understood as being insulated from political ideology or economic interest, its products, "facts of nature", may be received as objective, value-neutral representations" (*supra* note 8 at 54, 60).

[61] Woolgar, *ibid.*

shown any new risks to human health or the environment, beyond the usual uncertainties of conventional plant breeding…".[62]

Finally, as mentioned, Canada calls for "case-by-case analysis". Canada points out that the EC ("itself") has recognized that "like all organisms, GMOs are neither inherently risky nor safe."[63] The degree of risk or safety, Canada submits, depends on the characteristics of the inserted gene(s), the final organism that is produced, the environment in which the plant is released and the application to which the plant is put.[64] Thus, Canada states that "there is general agreement amongst international experts that risk assessments for biotech products should be carried out on a case-by-case basis".[65]

Scientific assessment of new crops or foods on a case-by-case basis favours the interests of biotechnology developers, and the complainants, because it denies the consideration of broader questions, such as "is this a technology we want to invest in?" or "is this the direction we want agricultural production to take in our country"? Case-by-case approvals of technological applications is an incrementalist approach that essentially removes the power to influence the *direction* of policy development from the political community.

First Submission of the U.S.

In its First Written Submission, the U.S. takes the basic position that the EC measures are not based on "sound science", and as such, they represent violations of the EC's commitments under the WTO, particularly with respect to the *SPS Agreement*. The U.S. also makes a case that the EC's failure to implement its own regulatory review process constitutes "undue delay". The U.S. strategy consists of six critical discursive moves.

First, the U.S. immediately moves to bring the *consumer* into the picture. It reminds the Panel that consumers have been and are currently "enjoying the benefits" of biotechnology with no adverse effect.

> The EC has adopted approval procedures for agricultural products produced with the benefit of modern biotechnology. Up to October 1998, the EC implemented those procedures, and approved

[62] *Supra* note 38 at para.18.

[63] *Ibid.* at para.23.

[64] *Ibid.*

[65] *Ibid.* at para.24.

> more than ten biotech products. *Consumers in the EC have been enjoying the benefits of these products*, without any adverse health or environmental effects.[66]

Not only does this constitute a reifying strategy for the U.S. - turning the abstract talk of safety, productivity and nature into a material thing (food) which is being eaten and enjoyed by Europeans and Americans alike,[67] it also is deploying a powerful norm of international trade law.

The objective of increasing consumer choice is central to liberal trade theory.[68] A greater choice in consumer goods is understood to increase the welfare of consumers.[69] This same strategy of invoking a norm that will be very familiar to the Panel is repeated in the next U.S. maneuver.

Second, the U.S. submission sets out to make the Panel feel comfortable, competent, at ease. The U.S. argues that the critical issue to be decided in this case is one that falls directly into an area of the Panel's core competence. For example, the U.S. emphasizes problems with the regulatory process in the EC and argues that the moratorium constitutes undue delay and is not transparent:

> The U.S. submits that the EC's adoption of the moratorium is inconsistent with the EC's obligations under the WTO Agreement, and in particular the *Agreement on the Application of Sanitary and Phytosanitary Measures*. While Members are allowed to maintain approval systems – and the U.S. is not objecting to the EC maintaining such a system for biotech products – the procedures under that system must be undertaken and completed "without undue delay." It is hard to think of a situation that involves "undue delay" more than a complete moratorium on approvals….. In short, having established a biotech approval regime, the EC is obligated to apply those procedures fairly and transparently, and without undue delay.[70]

The objective of this narrative is to reassure the Panel that they are on familiar territory, they have expertise in this area, and they can safely dispose of the case on this basis. Persuasion, as the best litigants have learned, "is dependent upon both the presentation and the *reception* of messages".[71]

Here, the U.S. is speaking directly to its audience in language they will be able to receive.

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[66] First Submission of the United States, *Biotech Products*, WT/DS291, April 21, 2004, at para. 1.

[67] Potter, *supra* note 6 at 107.

[68] For example, see the "Ten Benefits of the WTO Trading System", WTO website, online: http://www.wto.org/english/thewto_e/whatis_e/10ben_e/10b00_e.htm). See also the statement by Richard Mills, spokesman for U.S. Trade Representative Robert Zoellick, that the EC regime "denies choice to European consumers" ("Talks Collapse on U.S. Efforts to Open Europe to Biotech Food", New York Times, June 19, 2003). Labeling initiatives, ironically, also employ the language of consumer choice, Rich at 908 and Commission Press Release, *European Legislative Framework for GMOs Now in Place* (IP/03/1056, July 23, 2003).

[69] Ernst-Ulrich Petersmann, "The Transformation of the World Trading System through the 1994 Agreement Establishing the World Trade Organization", (1995) 6 EJIL, online: http://ejil.org/journal/Vol6/No2/art1-01.html.

[70] *Supra* note 66 at para.4.

[71] Goodrich, *supra* note 12 at 93.

Another example in a similar vein, is the U.S. strategy of evoking economic analogy. In a return to the narrative that emphasizes the advantages of genetic modification over more conventional breeding techniques, the U.S. calls on language the Panel is likely to be very familiar with: the language of economics.

> Improved understanding of the biochemistry underlying the laws of genetics has allowed scientists to operate on the molecular level and to develop new "transgenic" techniques – *i.e.*, techniques in which a discrete number of genes (usually one or several) are transferred to an organism. The major difference between the traditional forms of genetic modification described above and recombinant DNA technology is not in the basic strategy but the much *improved efficiency* and precision of the genetic transfer. In both cases, *the goal is to improve a plant* by introducing a particular trait or set of traits through the transfer of genes. Recombinant DNA technology permits scientists to accomplish this goal by transferring only those genes that are needed, without transferring unnecessary and potentially problematic genes.[72]

The appeal to "improved efficiency" puts the opponents of biotechnology in the position of "luddites" wanting to hold society back, stuck in the past using primitive inefficient methods. Embedding market logic and economistic rationality in the narrative plays into the "dominant nature-exploiting cultural code of modernity."[73] The U.S. knows well that representations will be regarded as realistic to the extent that they employ language "so familiar it operates transparently".[74]

Third, in grounding its argument in the *SPS Agreement*, the U.S. relies on the ideological work done by the call for "sound science".[75] It states:

> One of the most important concepts in the SPS Agreement is that any sanitary or phytosanitary measure must have a basis in science. Article 2.2 of the Agreement explicitly obligates Members to "ensure that any sanitary or phytosanitary measure is . . . based on scientific principles and is not maintained without sufficient scientific evidence." This requirement was intended to allow Members to protect *against real concerns* regarding food safety and human and animal health while reducing potential abusive uses of SPS measures for *protectionist* rather than legitimate purposes.[76]

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[72] *Supra* note 66 at para.14

[73] O'Mahony & Skillington, *supra* note 4 at 110.

[74] Potter, *supra* note 6 at 88.

[75] Levidow and Carr, for example, argue that "sound science" is a political slogan intended to "ensure that the burden of evidence falls upon those who make risk claims, rather than on those who claim safety", s*upra* note 43.

[76] *Supra* note 66 at para.98.

The call for "sound science" is intended to suggest a proposition so reasonable that no one could object to it – that reliable information and knowledge will produce better policy. The "sound science" principle, however, conceals a very basic normative assumption: that society should proceed with any technological advance possible unless 'science' tells us not to. The only *real*, valid or legitimate reason for opposing a technology, according to this narrative, is a scientific reason.

Conflating technological advance with social progress is "so much an article of faith that public opposition to technology seems scarcely comprehensible". [77] Once the "sound science" dogma is adopted, and "acceptance of a technological innovation is deemed natural and 'right', then caution and resistance become the phenomena that demand special explanation".[78] In this storyline, since 'knowledgeable' citizens would have "no good reason to hold out against new and beneficial technologies", any resistance must derive from ignorance, superstition or irrationality. The strategy of the U.S. here is to set up a binary choice: the measure is either based on "sound science" or it is "disguised protectionism".

Fourth, the U.S. 'ups the ante' by bringing in the potential benefits associated with the development of these technologies. The submission expresses the U.S. "confidence" that "once the EC allows its scientific and regulatory procedures to reach their conclusion, it will once again approve new biotech products, benefitting EC *consumers and biotech producers* around the world".[79] This statement is illuminating because it gives a clue to the U.S. conception of the "stakeholders" in this dispute: they are EC consumers and biotechnology firms. And yet, in their rhetoric, the U.S. seems to be concerned about a much wider group of stakeholders. First, for example, they make reference to the therapeutic applications of biotechnology for victims of disease:

> In theory, any gene from any living organism can be transferred into another organism giving that organism the ability to do something that it could not previously have done – *e.g.*, resist a particular disease or produce a vitamin it had not previously been able to produce. Some of the early applications of this knowledge and of transgenic technology have been dramatic and profound. For example, before the enhancement of this technology, humans suffering from diabetes had to obtain insulin from the pancreases of pigs. Now, most insulin used in human therapy for diabetes can be produced using human genes responsible for the production of insulin.[80]

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[77] Jasanoff, "Citizens at Risk", *supra* note 11 at 367.

[78] *Ibid.*

[79] *Supra* note 66 at para.6.

[80] *Ibid.* at para.15

Next, they allude to the benefits of modern biotechnology for the environment, including higher agricultural output and lower utilization of agricultural chemicals, fertilizers, and water in commercial farming.[81] And finally, the U.S. raises the prospect that biotechnology will, on top of all these other benefits, alleviate world hunger:

> As Nobel Laureate Norman Bourlaug said, the requirement to double the current level of food production by 2025 (to meet world food demand) "cannot be accomplished unless farmers across the world have access to current high-yielding crop production methods as well as new biotechnological breakthroughs that can increase the yields, dependability, and nutritional quality of our basic food crops.[82]

In this narrative, the 'benefits of biotechnology' stands in for universal human progress.

Fifth, the U.S., in a defensive strategy, aims to demonstrate the proven safety record of GMOs. This is a clear attempt to pre-empt the EC's detailing of the questions surrounding safety and to take the sting out of their critique. Where the EC will attempt to convey vast scientific uncertainties with respect to this 'new' technology, the U.S. works to construct experience, evidence and certainty.

> The *safety of biotech products has been confirmed* by scientific reports issued under the auspices of renowned international institutions, such as the FAO and WHO, seven national and international academies of science, and the OECD, as well as independent scientists in the U.S., Africa and Europe…The scientific findings on the safety of biotech products are confirmed by *empirical evidence*. For the past decade, farmers in various parts of the world have been sowing and harvesting millions of acres of transgenic corn, soybeans, rapeseed, potatoes and cotton, all of which are used, to greater or lesser degrees, in the production of food products or animal feed. The multinational science academies report concluded that "[t]o date, over *30 million hectares* of transgenic crops have been grown and no human health problem associated specifically with the ingestion of transgenic crops or their products have been identified." Similarly, the French National Academy of Science noted that transgenic crops are *widely cultivated*, and "there has never been a health problem regarding consumers or damage to the environment." Finally, a report by the Royal Society of the United Kingdom stated, "[g]iven the *very long history* of DNA consumption from a wide variety of sources, we conclude that such consumption poses no significant risk to human health, and that additional ingestion of [genetically modified] DNA has no effect.[83]

An important part of this narrative is to counter the anticipated 'novelty' argument by leaving the Panel with the impression that this technology is already so ubiquitous, that it is essentially futile to object to it. The U.S. emphasizes that the technology is "now *widely used* to improve the functionality and yield of

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[81] *Ibid.* at para.16.

[82] *Ibid.*

[83] *Ibid.* at paras. 27 and 28.

economically important plants around the world". The submission describes several "cultivars of food plants" that have been developed since the early 1990s, mentioning even the Flavr Savr tomato, "modified to delay ripening and extend shelf life", that was a complete commercial failure. The point, however, according to the U.S. submission, is that "[b]y 2002, *five and a half to six million farmers* were cultivating crops derived from recombinant DNA technology on 58.7 million hectares (145 million acres) of land". Since 1996, it emphasizes, "the global land area devoted to transgenic crops has grown thirty-five-fold", the crops are cultivated in sixteen countries, and fifty one percent of the world's soybeans are produced from transgenic seed.

Sixth, and finally, the U.S. caps their case with the provision of a 'motive'. Demonstrating a protectionist intent on the part of the nation erecting a trade barrier is an important rhetorical hurdle notwithstanding the fact that the failure to do so is not a bar to success under the *SPS Agreement.*[84] The U.S. knows that, at the end of the day, their task is to convince the Panel that this really is protectionism:

> The EC has applied the general moratorium in a manner that results in "discrimination or a disguised restriction on international trade"… In determining whether a measure has been applied in a manner that results in "discrimination or a disguised restriction on international trade," the Appellate Body has considered certain factors (*e.g.*, "warning signals" and "additional factors")…The EC's application of the general moratorium exhibits all three "warning signals" and an "additional factor" which indicate that the measure discriminates or provides a disguised restriction on international trade.

As to the evidence of a protectionist motive, or 'warning signals' of such an intent, the U.S. points to the fact that the EC opts for different levels of protection from risks in "different yet comparable situations".[85] For example, they show that the EC regime tolerates products produced from GMO processing aids (such as test-tube production of the enzyme chymosin used in the production of some specialty cheeses, or GM yeasts used in the production of beer). The implication is that since these products are not subject to the same regulations as GM foods and crops, the real intent behind the strict regime must be the protection of EC farmers and not the protection of EC consumers or the environment. In making the case for a "disproportionate effect" of the 'moratorium' on producers outside the EC as compared to producers within the EC, the U.S. adopts a factual, descriptive tone:

> In 2001, the EC accounted for less than four-tenths of one percent of the worldwide land area devoted to growing biotech products. In contrast, the U.S., Argentina, Canada, and China accounted for ninety-nine percent of the total land area devoted to biotech products in 2001. For

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[84] As Joanne Scott argues, "the significance of the SPS Agreement is that it takes us "beyond a discrimination-based approach to international trade", *supra* note 2 at 159.

[85] *Supra* note 66 at para.120.

> producers in these countries, the moratorium on approvals of biotech products has had a substantial negative effect. The disproportionate impact of the general moratorium on internal versus imported products is an "additional factor" as it is a strong indication that the measure is discriminatory or a disguised restriction on international trade.

But what the U.S. needs to watch out for here is the 'dilemma of stake'.[86] This is the possibility that anything a party says may be dismissed or discounted as an artifact of their stake or interest in the outcome. Thus, "[m]anagement of stake is one of the central features in the production of factual discourse".[87] Implying a trade protectionist motive in this case is a double-edged strategy for the U.S. In demonstrating a disproportionate impact on its own producers versus EC producers, it is also revealing and foregrounding its own stake in characterizing the issues in the way it does. The description firmly establishes the U.S. interest: they are heavily invested in this technology and their industry is whole-heartedly committed to it.[88] Interest-invoking potentially carries a lot of sway but in this case it also may work to undermine the fact-construction ability of the U.S.

THE DEFENCE

The tone of the EC defence is indignant. It characterizes its contested regime as the careful actions of a prudent government in the face of uncertainties around a new technology. Furthermore, it expressly argues that the WTO is not the right forum to decide a dispute of this nature. Even if the dispute is one that can be decided under WTO law, the EC takes the position that the complainants have framed the dispute too narrowly. For example, it argues that EC actions are entirely consistent with international

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[86] Potter, *supra* note 6 at 110.

[87] *Ibid.* at 111.

[88] Wright, for example, argues that the U.S. biotechnology firms felt they had a 'right' to develop these technologies and bring them to market after investing almost fifteen years in product research and development (S. Wright, "The social warp of science: writing the history of genetic engineering policy (1993) 18 *Science, Technology and Human Values* 31). Peel *et al* also note that the business of biotech is a multi-billion dollar industry, with both agricultural producers and biotechnology companies as the big players, at note 7. To put the financial stake in perspective, consider that, as Shaffer & Pollack uncovered, the lost soy exports alone from the U.S. are valued at about $1.5B or thirteen times the value of lost beef sales to the EU in the earlier food fight over beef hormones (*supra* note 36 at 27).

standards, and in fact, its actions are best judged according to the most relevant international treaty, the *Cartagena Protocol*.[89] The EC makes essentially five moves.

First Written Submission of the EC

The first discursive strategy of the EC is to "win back the words".[90] It intends to make it very clear to the Panel: we are dealing with *genetically modified* organisms. Not 'modern biotechnology' or 'biotech products' or 'agricultural products produced with the benefit of modern biotechnology'.[91] In the request for consultations, the U.S. framed their complaint as one pertaining to the EC "measures affecting the marketing and approval of biotech products", and this language has been adopted by all the official WTO documents. The EC submissions resist this terminology, and speak repeatedly about 'GMOs', 'GM crops' and 'GM foods'.

This move disrupts the narratives introduced by the complainants by introducing competing descriptions. A "genetically modified organism", according to the EC, "is an organism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination." [92] The *unnaturalness* of GMOs is a thread that runs through the EC narrative. For example, the EC continually returns to the claim that "alteration to genetic material which leads to the production of a GMO usually consists of the *insertion of foreign genes* into the cells of the receiving organism".[93] The submission repeats that it is "*foreign*" genes that are inserted during genetic modification… and that "[t]he difference between genetic modification and conventional breeding practices is that the latter do not allow for the crossing of *natural* species barriers, or for the transfer of single or few genes instead of whole genomes."[94]

This narrative aims at transforming the normalized, the ordinary and the routine, into the foreign, the unknown, the risky. GMOs are portrayed as *unnatural* because the genes are introduced from the

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[89] *Cartagena Biosafety Protocol to the Convention on Biological Diversity*, 39 ILM 1027 (2000) (entered into force 11 September 2003) ('*Cartagena Protocol*').

[90] Reference is to the title of Mary Richardson, Joan Sherman and Michael Gismondi, *Winning Back the Words: Confronting Experts in an Environmental Public Hearing* (Toronto: Garamond Press, 1983).

[91] These phrases appear in the submissions of the complainants. The U.S. submission, at para.10 for example, defines "biotech products" as "plant cultivars that have been developed through recombinant DNA technology, the most advanced technique of genetic modification", *supra* note 66.

[92] First Written Submission by the European Communities, *Biotech Products*, 17 May 2004 at para.17.

[93] *Ibid.* at para. 18.

[94] *Ibid.* at para.19, 20.

'outside", not belonging, as in a 'foreign object'. Dictionary references to the word foreign indicate that related words include "obnoxious", "repellant", and "repugnant".[95] Thus, the 'unnatural' is meant to convey not only a sense of the unknown and the uncertain, but a sense of the unwanted, the unwelcome.

Invoking the natural/unnatural dichotomy is a telling strategy. The construction of binary oppositions is intended "to place two things in hierarchy, to ensure that one is favoured over the other" .[96] The opposition "works to undermine the credibility of one side and to support that of the other".[97] Just as to characterize something as 'natural' can be "a powerful way of legitimating it"[98], so the label 'unnatural' invites illegitimacy. Thus the EC's definition of what constitutes a GMO, an organism whose cells have undergone the *insertion of foreign genes*, while it is framed as cold hard description, leans towards normative judgment in its choice of language.

Second, the EC, cultivating its image as the careful, prudent, responsible government, stresses the balance and reasonableness of its approach. The EC states that it "has not adopted any general position either in favour or against GMOs".[99] Attempting to adopt an impartial, disinterested stance, the EC seeks to discount the 'stake' that the U.S. submission carefully constructed in its arguments on disguised protectionism. The EC states that it recognises the "very real *potential* benefits" of GMOs. It also underlines that it "is equally conscious, however, that the technologies which produce GMOs are *new* and their long-term consequences relatively unknown".[100] Thus the 'novelty' of GMOs which was so carefully dismantled by the U.S., is systematically re-built.

Next, in line with this emphasis on the unknown, the EC sets out to document the uncertain and evolving state of the science around GMOs. It argues that the matter is tremendously complex scientifically and argues that the effects of GMOs and GM foods on health and the environment are only beginning to be understood.[101] According to the EC, both the "underlying science and the evolution of acceptable

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[95] Merriam-Webster Dictionary Online, "foreign", online: http://www.m-w.com/cgibin/thesaurus?book =Thesaurus&va=foreign.

[96] Richardson *et al*, *supra* note 90 at 16.

[97] *Ibid*.

[98] Potter, *supra* note 6 at 89.

[99] *Supra* note 92 at para.2.

[100] *Ibid.*

[101] The EC walks a fine line in this part of their submissions. While they seek to emphasize the uncertainty around GMOs, they also want to be able to demonstrate some cause for alarm. In other words, they want to argue that while much is unknown about GMOs, it is possible to predict or foresee harm related to their development.

regulatory solutions" remain "in a state of great flux".[102] All over the world, the Panel is reminded, GMOs "have been the subject of intense debate between governments and amongst members of the public."[103]

> GMO research and development is an *ever evolving* science. To begin with, the very process of creating GMOs is still *surrounded by uncertainties.* Despite advances, it has already been mentioned that the various techniques of inserting foreign DNA do not control where the insertion takes place, the number of copies inserted or their level of expression, nor do they guarantee that the foreign gene is stably integrated by the host genome."[104]…There remains *significant scientific uncertainty*, and *prudent governments* have put in place and funded long-term farm-scale trials to assess these impacts before authorising commercial growing of GM crops as well as requirements for continuous monitoring of the effects."[105]

The narrative of 'prudence' and 'precaution' is central to the EC defence. The EC returns repeatedly to this storyline:

> The EC actions in taking *all necessary steps demanded by its citizens* to protect against risks to human health and the environment were *prudent* and they were reasonable. The EC did not go as far as certain other states (or parts of states) which actually adopted outright bans (albeit sometimes of a temporary nature) on trade in, and cultivation of, GMOs and/or GM products."[106]
>
> …the approach of the EC to the identification, assessment and prevention of risks to human health and the environment from each of these GMOs has been fully consistent with evolving and applicable international standards, and any finding to the contrary would seriously undermine the effectiveness of those standards, which are premised on the application of a *prudent and precautionary approach*…[107]

Discussion of the precautionary principle, and the centrality of "precaution" to the rhetoric of this dispute, is explored in Part III of this paper.

Fourth, the EC counters the doctrine of 'substantial equivalence'. The argument that GMOs are largely equivalent to their conventional counterparts, a central element in the complainants' cases, is outright rejected by the EC. In fact, the EC argues that the international community has clearly rejected 'substantial equivalence' as well. It states:

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[102] *Ibid.* at para.9.

[103] *Ibid.* at para.13.

[104] *Ibid.* at para.36.

[105] *Ibid.* at para.64.

[106] *Ibid.* at para.9.

[107] *Ibid.* at para.12.

> …between 1996 and 2000 a specialised international convention – the Cartagena Protocol on Biosafety ("Biosafety Protocol") - was negotiated, which is *premised on a clear understanding that the inherent characteristics of GMOs require them to be subject to rigorous scrutiny* so as to ensure that they do not cause harm to the environment or human health, or cause socio-economic disruptions.[108]

Thus, the EC takes the very existence of the *Cartagena Protocol* to be evidence that the international community has concluded that GMOs are *not* to be treated as being the same as their non-GMO, conventional equivalents. Further, it stands for the proposition that special measures of protection, based on the *precautionary principle*, are justified with respect to the regulation of GMOs.[109] In order to legitimate their special regulatory treatment, the EC builds up a narrative that emphasizes the uniqueness of GMOs. This narrative is based on the characterization of GMOs as *living* technologies, with the capacity to reproduce, and self-replicate.

> In the specific case of GMOs, regulators have to deal with new types of *living* organisms which once released into the environment can *self-replicate* and spread without further human intervention. Therefore, product withdrawal after environmental release becomes a lot more complicated in the case of GMOs than in the case of products like chemicals. As a result, the development of GMOs has been raising all new challenges for regulators.[110]

Fifth and finally, the EC transforms the debate into an issue of sovereignty and invokes its right to set its own "level of protection".[111] From a rhetorical perspective, this is the EC's most critical maneuver**.** The EC begins this offensive by noting that it "has not sought to impose its approach" to GMOs on the complainants. They are free, according to the EC, to "form their own view on the balance of benefits and risks" associated with the technology. The EC continues:

> Equally, however, it c*annot be right that the Complainants should be allowed to impose their approach* on the EC, or indeed on any other countries, and to do so through the WTO. Even less so at a time when countries around the world are still trying to clarify the balance between risks and benefits."[112]

This is a direct challenge to the limits placed on the debate by Canada. Where the complainants toiled to carefully empty the dispute of social context in favour of 'historical and scientific context', the EC now seeks to reverse that process. The context that the EC wants to re-introduce is that of the political and

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[108] *Ibid.* at para.5.

[109] *Ibid.* at para.15.

[110] *Ibid.* at para.67.

[111] This is a reference to the *SPS Agreement,* Art.5.4, to be discussed in Part III.

[112] *Supra* note 92 at para.2.

social controversy swirling around GMOs. It states that "[t]he Panel needs no reminding that in many countries both at the political level and in society at large extensive debates have been going on about the advantages and risks of these products."[113] The message for the Panel is this: do not allow the complainants to put blinders on you, you know very well what this case is about. As the EC states, their regulatory scheme represents "a *very finely calibrated equilibrium between all interests involved*."[114] That balancing, it is implied, is the basic task of sovereign governments.

Returning to the central storyline, the EC submits that this issue is clearly too broad and too important to be dealt with under a trade agreement. First, it points to the narrow focus of the *SPS Agreement* with respect to the *types* of risks that SPS measures can be aimed to protect against: the *SPS Agreement* only applies to measures aimed at mitigating risks to human, plant or animal life or health.

> Where legal complexity is concerned, the Complainants prefer that the matter be treated under the *SPS Agreement*, but measures in respect of GMOs and GM food are much too complex to be covered by that WTO agreement alone. These measures seek to protect against risks, in particular *environmental risks* that are not covered by the *SPS Agreement*. And even with respect to health risks, the EC will demonstrate that some risks against which the EC legislation seeks to protect, may not come under the SPS notion of "disease." It will, therefore be necessary to arrive at a much more sophisticated legal analysis than the Complainants have set out….in respect of each of the GMOs the steps which have been taken to protect the environment and to conserve biodiversity are reasonable and legitimate, are not necessarily sanitary or phytosanitary in character, and fall in whole or in part outside the scope of the *SPS Agreement*…"[115]

The *SPS Agreement*, it is argued, cannot apply to measures taken to protect against risks to the environment. The EC submits that the agreement is specifically designed to regulate measures aimed at a narrow subset of risks. To the extent that the risks that the EC sought to avoid are of a *different nature*, as is "partially the case" with GMOs, the EC argues that "the provisions of the *SPS Agreement* are simply not designed to address such risks".[116] The issues arising out of the existence of GMOs, according to the EC "go far beyond" the risks envisaged by the *SPS Agreement*. "Indeed", says the EC, "they deserve their own agreement, and so a specific agreement has been negotiated" for this purpose. It is the *Cartagena Protocol* "which lays down the most pertinent provisions to any consideration of problems related to GMOs".[117]

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[113] *Ibid.* at para.3.

[114] *Ibid.* at para.4.

[115] *Ibid.* at paras.8 and 12.

[116] *Ibid.* at paras.385-386.

[117] *Ibid.*.

The EC is raising risks *other than* those to health or the environment? The complainants had made no mention of any such risks. But as the EC knows, the Panel is likely to be aware that citizens of many countries have genuine "misgivings about trade imbalance and multi-national corporate (often American) dominance, fears that the corporate quest for profit will override health considerations, the plight of small farmers, a mistrust of science, the erosion of trust in regulatory authorities, the desire for consumer choice and greater participation in decisions, and moral reservations about the meaning of manipulating living things".[118] The EC submission thus includes a defense of not only the natural or biophysical landscape within its borders, but the social and cultural landscape as well:

> First, there is a growing recognition that the authorisation of GM crops can have significant *socio-economic effects,* for example on the production of organic crops. Coexistence between GM crops and conventional crops has become a subject of increasing attention in that context, with research focusing on the potential impacts of GM crops on non-GM crops and on the economic and other consequences of inter-mingling…Second, beyond socio-economic considerations, some countries also take into account *religious and ethical considerations*.[119]

The second element of this storyline involves a questioning of the appropriateness of the WTO as forum in which to resolve this matter. The EC states that the complainants are seeking to use the WTO as a means of "short-circuiting" the responsible actions of the EC:

> The EC considers that the approach is entirely misconceived**:** *it is not the function of the WTO Agreement to allow one group of countries to impose its values on another group. Nor is it the purpose of the WTO Agreement to trump the other relevant rules of international law which permit – or even require – a prudent and precautionary approach*.[120]

The EC states that there is a "serious question as to whether the WTO is the appropriate international forum" for resolving all the issues raised. Further, the EC regrets that "the Complainants have chosen to start a dispute settlement procedure based on flawed premises, rather than to promote international co-operation as a means to build a sound international framework for addressing the GMO issue."[121]

To conclude this section on the rhetoric of pleading, I turn to Canada's second submission which nicely captures the themes and attitude of the complainants' case. It states:

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[118] Dorothy Nelkin, Phillipe Sands, and Richard B. Stewart, "The International Challenge of Genetically Modified Organism Regulation" (1999-2000) 8 N.Y.U. Envtal L.J. 523 at 527-528.

[119] *Supra* note 92 at para.81-83.

[120] *Ibid.* at para.10.

[121] *Ibid.*

> [D]espite the EC's attempts to mischaracterize and exaggerate the risks of biotech products and to insinuate that there exists significant and intractable scientific uncertainty, it is abundantly clear that the EC's scientific committees have thoroughly and carefully assessed, on a case-by-case basis, each of these risks in the context of specific applications and on the basis of sound and adequate scientific evidence. The unambiguous conclusion of the EC's own scientists is that the biotech products in question do not pose any greater risk to human health or the environment than their conventional counterparts.[122]

The claim is undeniably a legal one, but the battle is waged in a relatively new and unfamiliar language in the context of trade law. Its key parameters are the extent of scientific uncertainty, the adequacy of the scientific evidence, and the rigor of the risk assessment (including its dependence on the concept of 'substantial equivalence'). In the next part, I document the development of the jurisprudence at the WTO that has ushered in the changes that explain the centrality of this rhetoric.

PART III: *Disassembling the Double Helix*

> …it is as if even the word of the law could no longer be authorized, in our society, except by a discourse of *truth*.[123]

The case under the microscope here highlights some important trends in the science-based disciplines of the WTO with implications for the democratic governance of risk in a system of liberalized trade. As Shaffer & Pollack have noted, GMOs raise fundamental normative questions about the relative roles for science and politics in that system of governance.[124] This part begins by introducing the trends in jurisprudence that have fuelled the entanglement of science in international trade law. Next, I attempt to disassemble the double helix, first distinguishing the two strands of discourse, and then beginning to uncover and explain the key linkage points that bind the discourses together. These are sites at which communication flows, the points at which science may speak to law, and at which law may, in turn, speak to science. On the strand of legal discourse, an initial site of linkage is the notion of *risk*. When law encounters the need to assess risk, it turns to science. When science, in receiving this message, encounters *uncertainty*, another bond is established. Here, science turns back to law for instruction, and law responds with the doctrine of *precaution*. Finally, I reflect on the complexity of the double helix

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[122] *Ibid.* at para.147.

[123] Michel Foucault, *The Order of Discourse* [1971] in R. Young (ed.) *Untying the Text: A Post-Structuralist Reader* (London: Routledge, 1981) 48-78 at 55.

[124] Shaffer & Pollack, *supra* note 36.

structure and the complex web of bonds that, in the end, renders the task of disentanglement futile. In privileging science, and adopting the attitude that scientific discourse is independent and distinct from normative influences, the WTO (through the *SPS Agreement*), neglects the critical role of culture in the perception and construction of risks.

Tracing the Entanglement in the Jurisprudence

International trade regimes increasingly label environmental and health measures taken by nations as unfair barriers to the free movement of goods across borders.[125] Further, these regimes are increasingly focused not only on whether the measures effect unjustified trade discrimination[126], but whether the measures are "reasonable and rational".[127] To this end, science has come to be relied on as an objective arbiter, tasked with distinguishing whether a national environmental or health regulation is a legitimate or illegitimate barrier to trade. These developments have led to the growing concern that the international trade regime, particularly with respect to health and the environment, is undermining national sovereignty and compromising democratic choices.[128]

The coupling of scientific and legal discourses that I describe as the 'double helix' of international trade law is a relatively recent phenomenon. Formally, the legal discourse began drawing in science with the 1994 conclusion of the *SPS Agreement*[129], and the affinity seems to be gaining momentum in the recent

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[125] Michael J. Trebilcock, 2002, *Trade Liberalization and Regulatory Diversity*, Third EnviReform Conference, University of Toronto, online: http://www.library.utoronto.ca/envireform/conference/ nov2002/trebilcock-paper.pdf, accessed December 9, 2002.

[126] The National Treatment Principle in Article III of the General Agreement on Tariffs and Trade, 1947 ("GATT") requires equal treatment of domestic and foreign producers of like or competitive goods. Also Joanne Scott, *supra* note 2.

[127] J. Bohanes, "Risk regulation in WTO law: A procedure-based approach to the precautionary principle" (2002) 40 *Columbia Journal of Transnational Law* 323.

[128] *Ibid*. at 326. See also some discussion of these concerns in Robert Howse, "Democracy, Science, and Free Trade: Risk Regulation on Trial at the World Trade Organization" (1999-2000) 98 *Michigan Law Review* 2329 and Jacqueline Peel, "Risk Regulation under the WTO SPS Agreement: Science as an International Normative Yardstick?" (2004) *Jean Monnet Working Paper Series* edited by J.H.H. Weiler, NYU School of Law.

[129] *Agreement on the Application of Sanitary and Phytosanitary Measures*, Apr.15, 1994, Marrakesh Agreement establishing the World Trade Organization, Art.7 and Annex B, *reprinted in* H.R. Doc. No. 103-316 [hereinafter

case law. The project of global trade liberalization is clearly energized by scientific rationality. Under the *SPS Agreement*, if a nation enacts standards that are stricter than the international norm, they *must* base them on risk assessment, scientific principle and scientific evidence.[130] Specifically, Article 2.2 requires that Members ensure that every *SPS measure* is "based on scientific principles and is not maintained without sufficient scientific evidence". Article 3.3 states that Members may maintain a higher standard than the international norm if there is a "scientific justification". The term "scientific justification" is explained in Article 5: measures must be "based on" a risk assessment, and the risk assessment "shall take into account available scientific evidence" of risk (among other things).

The term "risk assessment" is defined in Annex A as:

> the evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences; or the evaluation of the potential for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins, or disease-causing organisms in food, beverages or foodstuffs.[131]

That a nation wishing to enact a measure stricter than the international norm must base it on risk assessment, scientific principle and scientific evidence is true even for *non-discriminatory* regulations.[132] That is, even measures not drawing a distinction between the treatment of domestic products and imports are vulnerable to attack at the trade tribunal. And while Members ostensibly have the right to enact the SPS measures they deem appropriate to protect life or health, they must ensure that they are not more trade restrictive than necessary.[133]

WTO panels working under the *SPS Agreement* are charged with making "an objective assessment of the facts", including facts of a scientific or technical nature.[134] Parties often present complex scientific arguments in their submissions and may include scientists on their delegations, and Panels may also

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SPS Agreement]; Vern R. Walker, "Keeping the WTO from becoming the World Trans-Science Organization: Scientific Uncertainty, Science Policy, and Factfinding in the Growth Hormones Dispute" (1998) 31 Cornell Int'l L.J. 251 at 253; David A. Wirth, "The Role of Science in the Uruguay Round and NAFTA Trade Disciplines (1994) 27 Cornell Int'l L.J. 817 at 825.

[130] *SPS Agreement*, *ibid.*

[131] *Ibid* at Annex A.

[132] Howse, *supra* note 128 at 2329. See also Scott, *supra* note 2 at 159 (arguing that the significance of the SPS Agreement is that it takes us "beyond a discrimination-based approach to international trade").

[133] *SPS Agreement*, *supra* note 129 at Article 5.6.

[134] WTO Dispute Settlement Understanding, Annex 2, (1994) 33 I.L.M. 28, Article 11 (hereafter 'DSU'). See Peel, *supra* note 128 for a discussion of relative expertise of the 'generalist' panelists and the resulting appropriateness of a lack of deference to domestic regulatory agencies.

appoint independent experts to provide advice on relevant scientific and technical matters.[135] Generally, as Jacqueline Peel explains, "a panel in an SPS dispute will appoint three to five experts covering a range of disciplines on the advice of secretariats of international organizations such as the *Codex Alimentarius Commission*".[136] The panel is not bound to follow the advice of the experts, although in practice the panels have tended not to stray far from the views of the experts when settling disputed scientific questions.[137] These 'factual' determinations are generally not interfered with by the Appellate Body since only matters which can be framed as legal claims may be raised on appeal.[138] As a result of this regime, tradeoffs reached in domestic risk regulatory processes are increasingly likely to be subject to international scrutiny, and governments forced to defend their regulatory regimes under the *SPS Agreement* are finding that "deference to the judgment of regulators balancing social against scientific considerations has not been a feature of the SPS case law to date".[139] The regime essentially sets up a binary choice: a measure is either based in "sound science" or it represents "disguised protectionism".

It is safe to assume that these developments in the jurisprudence have shaped the form of claims-making by actors seeking to achieve success under this regime. In particular, in this case, I would argue that the developments have invited the parties to purposefully include scientific claims in their submissions to the panel. At the same time, we can expect the parties to carefully weave legal and normative claims into the scientific discourse.[140] Thus my analysis seeks to un-spiral the two strands of discourse in the double helix with the aim of exposing the key binding sites where linkages between the strands are anchored. The first step in disassembling the helical structure, and in understanding the discursive battle unfolding over GMOs, would seem to entail distinguishing between 'the scientific' and 'the legal'.

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[135] See *SPS Agreement*, *supra* note 129, Article 11.2 and also DSU, *supra* note 134, Article 13.

[136] Peel, *supra* note 128 at 16. See also Theofanis Christoforou, "Settlement of Science-Based Trade Disputes in the WTO: A Critical Review of the Developing Case Law in the Face of Scientific Uncertainty" (2000) 8 N.Y.U. Environmental Law Journal 622, and Joost Pauwelyn, "The Use of Experts in WTO Dispute Settlement" (2002) 51 International and Comparative Law Quarterly 325. In the context of SPS, Robert Howse & Petros C. Mavroidis call the use of experts "routine" (Howse & Mavroidis, "Europe's Evolving Regulatory Strategy for GMOs – The Issue of Consistency with WTO Law: Of Kine and Brine" (2000-2001) 24 Fordham Int'l L.J. 317 at 347.

[137] *Ibid.*

[138] See for example, *Beef Hormones*, *supra* note 2 at para. 133.

[139] Peel, *supra* note 128 at 2.

[140] These same developments have also, of course, shaped the form of the regulations that have been enacted by Member states. For example, Shaffer & Pollack demonstrate how the SPS jurisprudence influenced the EU regulations by adopting the use of individual scientific risk assessments as the basis for regulatory action, *supra* note 36 at 5, 42.

Distinguishing the Strands

Legal discourse, as described by Peter Goodrich, is a language of power with specific political and ideological motives.[141] It is, according to Stanley Fish, irreducibly rhetorical.[142] Legal discourse is marked by its highly textual character and also by the restrictive institutionalization of its authorship and the specialized character of the legal audience.[143] According to Goodrich, it is "wholly imbricated within the interrelationships of power and truth or knowledge…it is paradigmatically concerned with truth, both in terms of evidence and verification…".[144] Legal discourse imports a "socially institutionalized set of restrictions or limitations upon who may speak, how much may be said and upon what topic and in what contexts".[145] It is an authoritative, unitary language. As illustrated by the previous analysis, it is a "dialogic form which endevours to predetermine the conditions and contexts of its reception".[146] Conventionally, legal discourse has sought to "exclude from the ambit of legal authority the possibility of alternative meanings and other discourses".[147] And here lies the significance of the recent trends in the SPS jurisprudence: the legal discourse explicitly invites science into its realm.

Science is understood in this work as a particularly powerful discursive and institutional framework. At its core is a strategy, or group of strategies, for knowledge-seeking. Thus science is a highly structured process of inquiry; a set of methods for knowing the world. It is at once a "form of organized work, a site of politics, a marketplace of ideas, an exercise in meaning-making, and an instrument of power".[148] The conventional view of science, however, holds it out as a neutral and objective method for evaluating empirical knowledge, for creating "*globally convergent* understandings about environmental

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[141] *Supra* note 12 at 204.

[142] Stanley Fish, *The Trouble with Principle* (Cambridge: Harvard University Press, 1999) at 3.

[143] Goodrich, *supra* note 12 at 117.

[144] *Ibid.* at 157.

[145] *Ibid.* at 173.

[146] *Ibid.* at 183.

[147] *Ibid.*

[148] Sheila Jasanoff, "Heaven and Earth: The Politics of Environmental Images" in Sheila Jasanoff & Marybeth Long Martello (eds.) *Earthly Politics: Local and Global in Environmental Governance* (Cambridge, MA: MIT Press, 2004) 31 at 35.

problems".[149] On this view, it appears almost natural that an institution like the WTO, in its *SPS Agreement*, would turn to science for assistance.

But science's ability to churn out globally convergent understandings of problems, particularly risk and trade problems, is under heavy fire. Science is more likely to be seen as both contingent and fundamentally indeterminate. As Joanne Scott notes, there is a large, theoretically sophisticated body of literature exploring the role of science in law and policy. "One of the central premises of much of this literature", she states, "has been a rejection of positivistic conceptions of science as capable of revealing an objective truth; a version of reality untainted by politics, ideology or exogenous values".[150] As a result of advances in this literature, mostly pursued in the tradition of the sociology of scientific knowledge, the socially-constructed nature of scientific knowledge is now widely accepted.

Thus it no longer is tenable to proclaim that 'scientific facts', themselves, drive policy responses or regulatory outcomes. In order to understand the dynamic by which science influences policy we have to probe further. How do certain facts become salient? How do certain actors acquire credibility? Whose knowledge is deemed important, and how is uncertainty resolved? Who participates? Instead of assuming that scientific evidence gains authority and confers credibility simply through its correspondence with 'truth', this literature would encourage more situated, localized investigations, asking in particular cases how scientific claims are interpreted within particular institutional frameworks.

As David Mercer and others have illustrated, "[t]he rhetorical mechanics of establishing a claim as scientific can take a myriad of forms".[151] Making the 'facts of the matter' do rhetorical work sometimes involves constructing broad framing arguments from basic declaratory statements.[152] For example, beginning with a section titled, "How the Technology Works", the U.S. submission sets out to teach the Panel the scientific 'truth' about 'modern biotechnology':

> During the past century, scientists also discovered that the basic genetic material in all living organisms is chemically similar. All DNA (deoxyribonucleic acid, the molecule that genes are made of) is a combination of just four chemical compounds – adenine, thymine, cystosine and guanine. The sequence in which these compounds appear on a particular gene is a biological code

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[149] Sheila Jasanoff, "Contingent Knowledge: Implications for Implementation and Compliance" in E. Weiss & H. Jacobson (eds.) *Engaging Countries* (Cambridge: MIT Press, 1998) 63 at 84.

[150] Joanne Scott, *supra* note 2 at 158.

[151] Mercer, *supra* note 18 at 207. Mercer also points to Michael Mulkay, Jonathan Potter, and Steven Yearley, "Why an Analysis of Scientific Discourse is Needed" in Karin Knorr-Cetina and Michael Mulkay (eds.) *Science Observed: Perspectives on the Social Study of Science* (London: Sage, 1983).

[152] Mercer, *ibid.* at 209.

> – instructions that the cell machinery follows in order to manufacture different proteins. The particular set of proteins produced in an organism – whether a plant, animal or microorganism – direct the functions necessary for life and for the expression of specific traits. Because DNA is chemically similar in all living things, different organisms can read and interpret the information encoded on any gene.[153]

This passage concludes with a broad framing argument, essentially a *judgment*, by building up a series of basic declaratory statements. Essentially, it derives the conclusion that 'transgenics', or the insertion of genes from an organism of one species into another organism of another, even if very different, species is acceptable, even *natural*, because all living things are essentially the same. The U.S. neatly packs a normative judgment about crossing the species barrier into a descriptive passage about basic molecular biology. Through this maneuver, genetic 'facts' can be made to speak about trade.

Another strategy for establishing a claim as scientific is to invoke the complex methods through which scientific knowledge is produced and ratified to build authority and credibility.[154] Just as discourses can be seen to be "producing objects", such as 'rDNA crops' or 'Frankenfoods', they can also be seen to be "producing subjects".[155] This discourse constitutes 'the scientist' as a particular person. It produces a subject with particular authority, knowledge, and skills.[156] This work combines with the "sound science" orientation to portray all opposition to biotechnology as lacking in authority. It is not satisfied with establishing the falsity of the non-scientists' opinion; it is concerned further "with the negation of the reality of the non-scientist as a source of any valid opinion on biotechnology".[157] It simply denies the opposition a voice.

For example, to demonstrate how certain actors are systematically associated with specific types of actions and rationalities, I return to the parties' submissions with an eye to discovering "particular vocabularies and markers" placed specifically to increase the status of some actors or to undermine the legitimacy of others.[158] In the complainants' submissions, *scientists* take the following actions: they

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[153] *Supra* note 66 at para.13

[154] Mercer, *supra* note 18 at 208.

[155] Potter, *supra* note 6 at 86 invokes Michel Foucault's 1972 work (Foucault, *The Archaeology of Knowledge* (London: Tavistock, 1972).

[156] Potter, *ibid.* at 86.

[157] O'Mahony & Skillington, *supra* note 4 at 109.

[158] This line of analysis follows the example set by Goodrich in his deconstruction of Britain's 1981 Lord Scarman's report on the Brixton riots. Goodrich exposes how a narrative sequence of the report "systematically opposes a vocabulary and syntax of rationality in the narration of police activity to a syntax of emotion and irrationality" in the description of the actions of blacks (*supra* note 12).

"obtain greater understanding", "learn", "identify mechanisms"[159], "discover"[160], "operate, "develop", "improve" and "accomplish".[161] Scientific opinions "do not equivocate", they make "clear and unambiguous"[162] findings. The methods employed by scientists guarantees the objectivity of their claims. On the other hand, the EC actions are couched in emotional terms: they are arbitrary and "inconsistent"[163]. They "admit", "attempt"[164] and "claim".[165] They "obfuscate and mischaracterize" facts and evidence, present arguments that "find little, if any, resonance" in logic[166]; they "insinuate"[167], "rationalize"[168], selectively use scientific studies to "distort and exaggerate risks", and they "blatantly distort" the text of the Agreement and its interpretation in the jurisprudence. David Delaney has recently asserted that "we know law most intimately by what it renounces, repudiates, ignores or denies".[169] To know the *SPS Agreement*, then, is to know the following: it renounces inconsistency, repudiates irrationality, ignores "lay person", consumer and public views, and thus, as will be argued in the following section, it denies the cultural dimensions of risk perception and risk construction.

Identifying the Binding Sites: Risk, Uncertainty and Precaution

Having attempted to distinguish the strands of scientific and legal discourses that combine to form the double helix of international trade law dealing with environmental and health risks, I turn to their disentanglement. A key task in this regard is to uncover and identify the key linkage points that bind the discourses together. Each strand is punctuated intermittently by nodes of communication where linkages are anchored. The conversation, on the surface, seems relatively straight-forward. Legal discourse, for example, turns initially to science with the notion of *risk.* Scientific discourse then turns back to law for guidance when it encounters *uncertainty*. And finally, law responds with the doctrine of *precaution.* As I

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[159] US submission, *supra* note 66 at para.12.

[160] *Ibid.* at para.13.

[161] *Ibid.* at para.14.

[162] Canada's Second Written Submission, *Biotech Products,* 19 July 2004 at para.270.

[163] US. Submission at para.4.

[164] Canada's Second Written Submission, *supra* note 162 at para.12.

[165] *Ibid.* at para.15.

[166] *Ibid.* at para.9.

[167] *Ibid.* at para.96.

[168] *Ibid.* at para 105.

[169] David Delaney, "Semantic Ecology and Lexical Violence: Nature at the Limits of Law" (2001) 5 *Law.Text.Culture* 77 at 77.

will argue however, communication flows not only through the official channels, but also takes place *interstitially*. In this way, the strand of scientific discourse is permeated constantly by normative, social, ethical and cultural influences.

The Risk Bond

As discussed, the legal regime established by the *SPS Agreement* explicitly imports a requirement that Members "justify" regulatory measures more strict than the international norm. To be justified, measures must be "based on" a risk assessment, and the risk assessment "shall take into account available scientific evidence" of risk. Thus an initial site of linkage between law and science is the notion of risk. The SPS definition of "risk assessment" indicates that it should include both an evaluation of the likelihood or probability that harm will ensure, and an evaluation of the magnitude or consequences of the harm materializing.[170] This approach, which treats risk as "a quantity that can be measured precisely by means of a formula"[171], fits comfortably in the rationalist tradition and explains why "risk" has become the "dominant way to talk about GMOs in national and international circles".[172]

The U.S. submission adopts the 'conventional' view of "risk assessment": it is understood as "a factually grounded, objective, and value-free, analytic exercise requiring (1) precise identification of possible harms to human health and the environment, and (2) use of formal, expert-based assessments of the likelihood of such harms. Public values and concerns are thought to be relevant and appropriate only in the phase of risk management, which is perceived to follow risk assessment and be separate from it".[173] As is pointed out by the academic amicus brief, this conventional and "outmoded" view of risk assessment has been "systematically discredited through social science research over the past decade". [174] The amicae point out that the reliability of particular risk assessments is closely tied to the "degree of maturity and/or comprehensiveness of the scientific knowledge base", the contingencies of "national contexts" (both scientific and cultural), and the "wider background assumptions and value commitments" of those generating scientific knowledge for policy applications.[175]

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[170] *Ibid* at Annex A.

[171] Piet Strydom, *Risk, Environment and Society: Ongoing debates, current issues and future prospects* (Buckingham: Open University Press, 2002) at 76. In this view, risk is a simple function of the magnitude of the loss and the probability of it transpiring.

[172] Heller & Escobar, *supra* note 46 at 162.

[173] Academic Amicus, *supra* note 26 at 4.

[174] *Ibid*.

[175] *Ibid*.at 5.

The language of risk is the language of probabilities.[176] "[R]ecognizing the impossibility of certainty about the future, [risk assessment] simultaneously makes this lack of certainty quantifiable in terms of probability".[177] The very concept of risk is an admission of imperfect knowledge, of significant and persistent 'unknowns'. Thus the call for risk assessment itself, is a call for an investigation of uncertainties.

The Uncertainty Bond

How should these uncertainties be resolved? Brian Wynne's important 1992 work which breaks down the concept of uncertainty into several distinct components is critical. He emphasizes the key distinction between conventional conceptions of uncertainty and the concept of "indeterminacy".[178] Uncertainty is conventionally described as a lack of data. It arises when a situation has never been monitored, or the effect has been judged too expensive to measure. The perception that this type of uncertainty is dominant has fuelled the conventional view of risk as "amenable to resolution by the production of 'more science' to fill the gaps".[179]

Conventional risk assessment methods, similarly, tend to "treat all uncertainties as if they were due to the incomplete definition of an essentially determinate cause-effect system".[180] It is now clear, in large part due to the work of Wynne and others working in the sociology of scientific knowledge, that more distressing forms of uncertainty prevail. Indeterminacy, for example, involves "recognition of the essentially open-ended and conditional nature of all knowledge and its embeddedness in social contexts".[181] If scientific uncertainty is not merely incomplete data, but is more pervasive, then answering policy questions through risk assessment becomes more problematic. The "inevitable gap

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[176] Mary Douglas, *How Institutions Think* (Syracuse: Syracuse University Press, 1986) at 19.

[177] Nikolas Rose, "At Risk of Madness" in Tom Baker & Jonathan Simon, *Embracing Risk: The Changing Culture of Insurance and Responsibility* (Chicago: Chicago University Press, 2002) 209 at 214.

[178] Brian Wynne, "Uncertainty and environmental learning: reconceiving science and policy in the preventive paradigm" (1992) Global Environmental Change 111 at 112.

[179] Jane Hunt, "The Social Construction of Precaution" in Tim O'Riordan and James Cameron (eds.) *Interpreting the Precautionary Principle* (London: Cameron May, 1994) 117 at 118.

[180] Wynne, *supra* note 178 at 116.

[181] Jane Hunt, *supra* note 179 at 118. See also Katherine Barrett and Carolyn Raffensperger, "Precautionary Science," in C. Raffensperger and J. Tickner (eds.), *Protecting Public Health and the Environment: Implementing the Precautionary Principle* (Washington, DC: Island Press, 1999) 106 at 119.

between the closed conditions of experimental research, and the open-ended and contingent circumstances in which the results of scientific research are applied" severely limits our predictive capacities.[182]

The prevailing approach in the trade tribunals, which draws a sharp boundary between risk assessment processes and risk management, relies heavily on the "ideal" relationship between science and politics. In this view, knowledge is generated by competent, objective scientists in accordance with strict professional standards. The knowledge is then channelled, undistorted, to policy-makers who employ it as the factual basis for their decision.[183] Robert Howse, for example, questions the wisdom of bringing "non-scientific considerations" into risk assessment. In so doing, he argues, "one would be tilting *a priori* the scientific risk assessment towards the desired regulatory outcome, and any objective, unbiased informational output into the democratic deliberative process would be eliminated".[184] The "ideal" relationship between science and politics, and the view expressed by Howse, however, has been disintegrating for many years under relentless critiques emanating from research in the sociology of scientific knowledge.[185] This research reveals that even the scientific component of expert findings is necessarily influenced by the values, worldview and cultural filters of the risk assessor. It directly draws into question the objectivity of risk assessment, and the legitimacy of demarcating a boundary between that process and the 'more political' risk management process. As Joanne Scott argues:

> in the event that science neither proves the existence of a risk, nor proves that there is no risk, there is scope for 'rational' debate as to whether this theoretical risk should be tolerated. But it is a debate that will inevitably transcend scientific rationality, thus shattering the fragile illusion of objectivity and universal commensurability…[186]

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[182] *Ibid.*

[183] Tora Skodvin and Arild Underdal, "Exploring the dynamics of the science-politics interface" in Steinar Andresen, Tora Skodvin, Arild Underdal and Jorgen Wettstad (eds.) *Science and Politics in International Environmental Regimes* (Manchester: Manchester University Press, 2000) 22 at 22.

[184] Howse, *supra* note 128 at 379.

[185] For example, see Conrad G. Brunk, Lawrence Haworth and Brenda Lee, *Value Assumptions in Risk Assessment: A Case Study of the Alachlor Controversy* (Waterloo: Wilfred Laurier University Press, 1991); Sheila Jasanoff, *The Fifth Branch: Science Advisors as Policymakers* (Cambridge: Harvard University Press, 1989); Bruno Latour & Steven Woolgar, *Laboratory Life: The Social Construction of Scientific Facts* (Beverly Hills, Calif: Sage Publications, 1979); Steven Epstein, *Impure Science: AIDS, Activism and the Politics of Knowledge* (Berkeley: University of California Press, 1996).

[186] *Supra* note 2 at 160.

With respect to the GMO dispute, the academic *amicae* argue that the "biological properties and environmental and social impacts" for products of biotechnology are "neither well defined or certain"; that "differences in public values" are relevant not only to the management of risks, but also to their definition and assessment; that the scientific basis for risk assessment is "fluid and changing" both within national contexts and with respect to the development of international standards; and finally, that biotechnological risk depends on the behavior of producers and consumers embedded in particular social and environmental contexts.[187] Essentially, what the *amicae* are arguing is that scientific uncertainty consists of not only inadequate and incomplete data, which is expressed in confidence intervals and can usually be reduced through further investigation, but includes pervasive indeterminacies arising from the "confluence of biological, ecological, socio-cultural, and political systems".[188] When science encounters this intractable uncertainty, it inevitably turns back to law for instruction. Law responds with the doctrine of precaution.

The Precaution Bond

The precautionary principle has been called the "defining principle" of the modern environmental movement.[189] Environmental and health advocates having been pushing for several years to have the precautionary principle recognized formally as a principle of customary international law.[190] Current incarnations of the principle often take their form from the 1992 *Rio Declaration on Environment and Development*. [191] It states that "[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent

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[187] Academic Amicus, *supra* note 26 at 6.

[188] Brian Wynne, *supra note* 178 at 118.

[189] Ken Ogilvie, Executive Director, Pollution Probe, Speech at the International Joint Commission Workshop's "Expert Consultation on Emerging Issues" in Racine, Wisconsin, February 2003 (on file with author).

[190] In fact, many legal commentators have argued that the principle has already achieved this status: see for example, Harald Hohmann, *Precautionary Legal Duties and Principles of Modern International Environmental Law* (London: Graham & Trotman/Martinus Nijhoff, 1994) and Arie Trouwborst, *Evolution and Status of the Precautionary Principle in International Law* (The Hague: Kluwer Law International, 2002).

[191] John S. Applegate calls this the "most authoritative formulation of the principle" (Applegate, "The Taming of the Precautionary Principle" (2002-2003) 27 W. & Mary Envtal. L. & Pol'y Rev. 13 at 13). A prevalent 'alternative' statement of the principle comes from the 1998 Wingspread Conference: "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof. The process of applying the precautionary principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action" (Carolyn Raffensperger & Joel Tickner, *Protecting Public Health & the Environment: Implementing the Precautionary Principle* (Washington, D.C.: Island Press, 1999) at 353-354).

environmental degradation".[192] Essentially, the precautionary principle mandates action in the face of scientific uncertainty to prevent *potential*, but uncertain, harm to human health or the environment.

Conceptions of the precautionary principle range from the very inchoate notion of 'precaution', which takes on more the form of a philosophy than a legal principle, to the formal textual expressions of the principle in international law. This more flexible notion of 'precaution', popularized in the activist strain of the environmental health literature, has led to demands for the further incorporation of precautionary reasoning in the resolution of risk controversies.

The WTO specifically identifies the precautionary principle in Art.5.7 of the *SPS Agreement*. It states that where "scientific evidence is insufficient", governments may act "provisionally" on the basis of "available pertinent information".[193] But despite this explicit recognition of the precautionary principle, the EC (with the support of several non-governmental organizations) challenged this regime in the *Beef Hormones* that came before the WTO in 1998. In that case, the EC sought to incorporate precautionary reasoning in a more comprehensive way. Relying on the assertion that the precautionary principle constitutes a principle of customary international law, the EC argued that the principle's influence should be extended beyond Art.5.7 and should inform the tribunal's interpretation of all provisions in the *SPS Agreement*. According to the EC, the precautionary principle should have been available in order to justify national regulations that accounted for consumer concerns and risk perceptions of the wider public, even when those perceptions were not supported by the bulk of scientific evidence. The WTO tribunals, however, refused to apply the principle beyond the scope of the provisional measures enabled by Art. 5.7 of the *SPS Agreement*.[194]

Since this comprehensive application of the precautionary principle was rejected by the WTO Appellate Body in *Beef Hormones*, the EC has actively sought to export its 'precautionary approach' to regulation to

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[192] United Nations Conference on Environment and Development: *Rio Declaration on Environment and Development*, U.N. Doc. A/Conf.151/5/Rev.1 (June 13, 1992), reprinted in 31 I.L.M. 874, 879 at Principle 15. The principle has also been incorporated in numerous international treaties and declarations relating to the protection of the environment in recent years, including: the *Montreal Protocol on the Substances that Deplete the Ozone Layer*, reprinted in 26 I.L.M. 1550 (1987); the *United Nations Convention on Biological Diversity*, June 5, 1992, Rio de Janeiro, reprinted in 32 I.L.M. 818 (1992); the *United Nations Framework Convention on Climate Change*, 9 May 1992, reprinted in 31 I.L.M. 848 (1992); and the *United Nations Agreement on Straddling and Highly Migratory Fish Stocks*, August 4, 1995, reprinted in 34 I.L.M. 142 (1995), among others.

[193] SPS, supra note at Art.5.7.

[194] Bohanes, *supra* note 127 at 335.

international regimes in an effort to prevent future trade challenges.[195] The EC can now cite to the *Cartagena Protocol* as evidence of international consensus on the application of the precautionary principle.[196] The Protocol entered into force on September 11, 2003 and is signed by over 100 countries. Most countries that export GMOs, however, have not ratified the Protocol, including the complainants in this case.[197]

The *Protocol* expressly incorporates the precautionary principle. It states that a country may reject the importation of a GMO (or "living modified organism", in the language of the *Protocol*) for release into the environment where there is a "[l]ack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects…on the conservation and sustainable use of biological diversity in the Party of import, taking also into account risks to human health…".[198]

Canada's position on this point is typical of the complainants' stance. Canada argues that there is no inconsistency between the obligations of the *Cartagena Protocol* and the WTO obligations relevant to this dispute. The *Protocol*, in this view, is premised on transparent, scientifically sound risk assessment as the basis for decisions regarding the importation of the products to which it applies. While allowing that the *Protocol* may reflect the "precautionary approach", Canada notes that the precautionary principle "finds reflection" in several provisions of the *SPS Agreement*, including Article 5.7. Canada also reminds the Panel that the Appellate Body in *Beef Hormones* held that the precautionary principle could not be invoked as a ground for justifying SPS measures that were otherwise inconsistent with the obligations of Members set out in particular provisions of the *SPS Agreement*.

In fact, as mentioned in Part II, the narrative of *prudence* and *precaution* has all but replaced any reference to the precautionary principle in the submissions of the EC in the GMO dispute. The "precautionary principle", itself, is no longer being invoked primarily as a legal instrument. The EC

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[195] Grace Skogstad, "The WTO and Food Safety Regulatory Policy Innovation in the European Union" (2001) 39 Journal of Common Market Studies 485.

[196] Shaffer & Pollack, *supra* note 124 at 43.

[197] In a decision taken November 2003, the Canadian government stated that it could not ratify until further clarity was achieved on the implementation of "key provisions" (Agriculture and Agri-Food Canada, "The Biosafety Protocol", online: http://www.agr.gc.ca/itpd-dpci/english/topics/bsp.htm.

[198] *Cartagena Protocol on Biosafety*, Art.10.6. *The Cartagena Protocol on Biosafety to the Convention on Biological Diversity* was adopted by the Conference of the Parties to the Convention on 29 January 2000. The Protocol entered into force on 11 September 2003, ninety days after receipt of the 50th instrument of ratification. As of Wednesday, March 23, 2005, 117 nations have ratified the Protocol. Notably, the complainants, while signatories to the Convention, have not ratified the Protocol.

remembers well the outcome in *Beef Hormones*. Instead of making reference to the "precautionary principle", the language employed is that of *precaution* and *prudence*. It is the rhetorical deployment of the precautionary principle without the reliance on it in a strict legal sense.

Any legal relevance of the precautionary principle to the resolution of the dispute is now mediated through the EC's reliance on the *Cartagena Protocol*:

> …between 1996 and 2000 a specialised international convention – the Cartagena Protocol on Biosafety ("Biosafety Protocol") - was negotiated, which is *premised on a clear understanding that the inherent characteristics of GMOs require them to be subject to rigorous scrutiny* so as to ensure that they do not cause harm to the environment or human health, or cause socio-economic disruptions.[199]

Thus, the EC takes the very existence of the *Cartagena Protocol* to be evidence that the international community has concluded that GMOs are *not* to be treated as being the same as their non-GMO, conventional equivalents. Further, it is, according to the EC, the *Protocol* that stands for the proposition that special measures of protection, based on the precautionary principle, are justified with respect to the regulation of GMOs.[200]

The EC scheme for the regulation of GMOs can be considered precautionary not only in the sense that it requires prior approval of GMOs rather than simply assuming their safety until proven otherwise[201], but also because it rejects the assumption of 'substantial equivalence'. The scheme thus requires prior approval of GMOs, based on the demonstration of their 'safety' (taking into account the uncertainties that derive from their inherent *differences* from conventional foods), rather than assuming their 'substantial equivalence' to conventional foods until proven otherwise. But the scheme is still not precautionary in the Art.5.7 sense; that is, it is not explicitly *provisional*.

Thus, the precise form of law's 'answer' to science with respect to the binding site labeled *precaution* is still relatively opaque. Where it is relatively well-accepted in international environmental law that when faced with the question of how to handle scientific uncertainties, law's response is to now routinely answer with the precautionary principle, in the context of world trade law that answer is considerably more tentative. What the WTO tribunals will decide in this particular case is the appropriate role for precaution in the science-based trade disciplines – that finding is hotly contested and eagerly anticipated.

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[199] *First Written Submission of the EC, supra* note 92 at para.5.

[200] *Ibid.* at para.15.

[201] Howse & Mavroidis, *supra* note 136 at 367.

The axis of disagreement seems to be the question: What has really changed since *Beef Hormones*? Has the precautionary principle, in the intervening years, undeniably acquired the status of customary international law such that it should inform the interpretation of the WTO agreements generally? Has the coming into force of the *Cartagena Protocol* fundamentally altered the state of international law with respect to the trade in GMOs? And finally, if the trade tribunals do decide that measures governing trade in GMOs are now sheltered, to a certain extent, from trade scrutiny by the precautionary principle, will they limit precaution's influence on the science-based trade disciplines to cases involving GMOs, or will law's answer of 'precaution' be construed more broadly?

The exchange I have outlined, between the parallel strands of legal and scientific discourse in the 'double helix' of international trade law, on the surface, seems relatively straight-forward. Legal discourse, for example, turns initially to science with the notion of *risk.* Scientific discourse then turns back to law for guidance when it encounters *uncertainty*. And finally, law responds, albeit somewhat tentatively, with the doctrine of *precaution*. As I will argue however, communication flows not only through these official channels, but also takes place *interstitially*. Science and law are in a complex relationship: both discourses are constantly constituted through ubiquitous interaction with the normative, the social, the ethical, and the cultural.

Disentangling the Strands: The Problem of Interstitial Communication

While identifying the strands of discourse is, in theory, a simple task, teasing them apart proves much more difficult. The parties face an incentive, now that the privileging of scientific discourse is entrenched by the *SPS Agreement*, to embed normative and legal arguments within what are ostensibly 'scientific' claims. But the structure of the SPS Agreement assumes that science can be injected, in an objective manner, into to the legal process -- that the strand labeled science can be essentially isolated and extracted from other influences. This view tends to underestimate the degree of interstitial communication, enormous number and sheer complexity of exchanges and points of contact.

But the discourse of liberalized trade prefers to obscure the extent to which the scientific discourse is fundamentally intertwined with the legal, the social, the political and the cultural. Instead, it prefers to

deny the inevitable blurring of technical and normative dimensions.[202] The scientific strand is not and cannot be purely technical; nor can the legal be purely normative. It is futile to attempt to maintain the separation of the discourses. The two strands are hopelessly wound up together and the number of points of contact, of interstitial exchange, are innumerable.

Thus, in privileging science, and adopting the attitude that scientific discourse is independent and distinct from normative influences, the WTO (through the *SPS Agreement*), neglects the critical role of *culture* in the perception and construction of risks.

It is clear that the concepts of risk, uncertainty and precaution have now become integral to the nomenclature of the science-based trade disciplines. The difficulty underlying the application of each of these concepts is this pesky reality: risks are perceived and constructed through cultural filters.[203] Differences in social, political and cultural contexts matter. They matter in the perception and construction of what is "risky", in the perception and construction of what is "uncertain", and therefore, they matter to the determination of whether "precaution" in particular situations, is required.

In reflecting on the capacity of the science-based trade disciplines to accommodate culture, many will point to the SPS Agreement's Art.5.4 which is said to guarantee Members the "right" to set their own level of protection from risks. Art.5.4 empowers Members to choose the level of protection that the Member deems to be "appropriate to protect human life or health within its territory".[204] In determining their level of protection, Article 5.4 also states, however, that Members should "take into account the objective of minimizing trade effects".[205] Further, Art.5.5 stipulates that each Member "shall avoid arbitrary or unjustifiable distinctions in the levels it considers to be appropriate in different situations, if such distinctions result in discrimination or disguised restrictions on international trade".[206]

This limit on the Members' ability to choose its own level of protection imposes significant restrictions on the capacity for Art.5.4 to accommodate culture within the SPS Agreement. The requirement for "internal consistency" is clearly aimed at rooting out disguised protectionism, but it does so with dire

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[202] Sheila Jasanoff, "Citizens at Risk", *supra* note 11 at 368.

[203] Joanne Scott, *supra* note 2 (arguing that cultural filters mediate relationships with risk) at 160.

[204] Jacqueline Peel notes that the Appellate Body "has characterized the determination of an 'appropriate level of SPS protection' as a "right" of WTO Members and stridently argues that WTO decision-makers cannot and do not place any restrictions on Member's choices in this regard, other than those established by the trade-related provisions of Articles 5.4, 5.5 and 5.6", *supra* note 128 at 81-82.

[205] *SPS Agreement*, *supra* note 37.

[206] *Ibid.* at Art.5.5.

consequences. The 'consistency' of a nation's regulatory regime with respect to policies around environmental and health risks cannot be judged by reference to scientific studies and probability calculations taken out of social context. For example, a relevant consideration in determining 'consistency', according to the SPS Agreement, is "the exceptional character of human health risks to which people voluntarily expose themselves".[207] This raises a controversial issue in risk regulation: is it 'rational' for citizens to place a higher value on avoiding the same percentage chance of one risk as opposed to another?

Cass Sunstein & Richard Pildes emphasize the relevance of context to the determination of "rationality" in risk assessment.[208] When comparing expert and lay judgments, for example, they have argued that competing understandings of rationality are at play, each embedded within a specific set of assumptions about how risks ought to be valued.[209] Laypersons will tend to treat voluntarily-incurred risks differently than involuntarily-incurred risks; they will treat catastrophic or irreversible risks as distinct as well. But as Sunstein and Pildes argue, it is quite possible to defend, with reasons, why these categories of risks should be regulated in a different way. "Purely scientific considerations", in their view, "will not permit us to say which is the right way to resolve what rational policy choice ought to mean in the regulatory setting".[210]

A trade objective that seeks to impose "consistency" in a national regulatory regime imports a set of unchallenged but contentious assumptions about the relative 'rationalities' of expert and citizen assessments of risk. Much work has been devoted to the question of why citizen perceptions of a risk may differ from 'expert assessments' of the same risk.[211] At bottom, the answer seems to be that public perception of risk tends to include elements that are excluded from expert assessments.[212] As Sunstein and Pildes note:

> There is one strikingly consistent finding in risk studies: Laypeople assess risk through different value frameworks from those implicitly embedded in expert approaches. Laypeople do not look

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[207] *Ibid.*

[208] Cass R. Sunstein and Richard Pildes, "Experts, Economists and Democrats" in Cass R. Sunstein (ed.) *Free Markets and Social Justice* (New York: Oxford University Press, 1997) 128.

[209] Richard H. Pildes and Cass R. Sunstein, "Reinventing the Regulatory State" (1995) 62 U.Chi.L.Rev. 1 at 48.

[210] *Ibid.*

[211] Related work by Sheila Jasanoff attempts to explain cultural divisions about risk (why do different societies value different risks differently?): Sheila Jasanoff, "Citizens at Risk", *supra* note 11.

[212] In addition, to the extent that 'expert' assessments of risk adopt conventional risk assessment methodologies they would import an inherent bias in favour of avoiding false positives, and against regulation. This bias is not likely to be as systematically applied in citizen assessments: Carl Cranor, *Regulating Toxic Substances: A Philosophy of Science and the Law* (New York: Oxford University Press, 1993).

> only or even primarily to expected annual mortality; they look as well at a number of factors determining the acceptability of different risks in different contexts.[213]

Specifically, study after study has found that citizens often take account of the 'catastrophic' nature of the risk; the 'controllability' of the risk; the permanence of the potential loss; the equitable distribution of the danger and benefits associated with the risk; and the characteristics of the likely victims.[214] There is little basis, then, for the claim that the expert view is inherently more rational than the public assessment of the risk. [215]

Citizens' perceptions and constructions of risks include assessments of the technology's social, political and cultural implications. They include judgments about the fairness of the technology in terms of the distribution of risks and benefits and in terms of the values seen to be at stake. As Douglas & Wildavsky have argued, "between private, subjective risk perception and public, physical science there lies *culture*, a middle area of shared beliefs and values".[216] In risk-taking and in risk-aversion, they continue, these shared values, beliefs and fears must be part of the dialogue. In fact, Douglas and Wildavsky would assert that societies "choose their nightmares" on the basis of both social and cultural criteria, and because of this, their nightmares are different.[217]

Conclusion: Nature/Culture Clash?

> …the work we do with concepts transforms them.[218]

This dispute is captivating legal audiences in part because he EC and the U.S. are the world's two principal protagonists of liberalized trade.[219] Thus, one would assume that the shared normative

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[213] Pildes and Sunstein, *supra* note 209 at 56.

[214] *Ibid.*

[215] As Peter Sandman states: "When a risk manager continues to ignore these factors – and continues to be surprised by the public's response of outrage – it is worth asking just whose behavior is irrational" (Sandman, "Risk communication – facing public outrage" (1987) 13:9 *EPA Journal* 21-22).

[216] Mary Douglas & Aaron Wildavsky, *Risk and culture. An essay on the selection of technological and environmental dangers* (Berkeley, CA: University of California Press, 1982) at 194.

[217] *Ibid.* See also Pat Caplan, "Introduction: Risk Revisited" in Pat Caplan (ed.) *Risk Revisited* (London: Pluto Press, 2000).

[218] Marilyn Strathern, "The nice thing about culture is that everyone has it" in Marilyn Strathern (ed.) *Shifting Contexts: Transformations in Anthropological Knowledge* (London and New York: Routledge, 1995)153 at 169.

foundations for a system of free trade would be present, and yet increasingly, the EC and the U.S. disagree completely and sensationally on issues of huge national and international importance. The particular technologies at issue in this case, because they force the reconsideration of the basic categories of nature and culture, shatter some of the most elemental conceptions of human identity.[220] They "go to the human capacity not merely to control and regulate the environment, but also to make it and own it".[221]

There is no question that this case is playing out in the shadow of *Beef Hormones*, the food fight that preceded it. When the WTO ultimately ruled against the EC ban on synthetic hormones in beef in 1998, and the EC refused to comply with the ruling, the WTO authorized Canada and the U.S. to retaliate by withdrawing trade concessions. Both countries continue to target traditional foods such as the French *foie gras*, Roquefort cheese and Dijon mustard with retaliatory tariffs.[222]

This experience shaped popular understandings of GMOs in Europe, according to Shaffer & Pollack, as GMOs "became associated with consumer anxieties related to food safety crises, distrust of regulators and scientific assessments, disquiet over corporate control of agricultural production, ethical unease over genetic modification techniques, environmental concerns, and anger over the use by the United States of international trade rules to attempt to force "*unnatural*" foods to Europeans".[223]

As is reflected in the submissions, the construction of the *natural/unnatural* boundary is central to winning the rhetorical battle over GMOs. The dominant discourse on biotechnology reflects an "advanced capitalization of nature" that seeks to manipulate and modify biological organisms in search of new information, products and markets.[224] In fact, "nature" is not always invoked in an effort to denounce human intervention. As David Delaney argues, "nature" can also be "a category whose specific function is to render physicality knowable and, often, in need of being controlled. It is a category which informs the social-material practices by which people intervene in physical processes and participate in transformations in the material world".[225] Further, according to Murray Bookchin, the "all-encompassing image of an intractable nature that must be tamed by a rational humanity" provides an easy rationale for

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[219] Laurence Boisson de Chazournes & Makane Moïse Mbengue, "GMOs and Trade: Issues at Stake in the EC Biotech Dispute" (2004) 13 RECIEL 289 at 289.

[220] Damian Chalmers, "Risk, Anxiety and the European Mediation of the Politics of Life: The European Food Safety Authority and the Government of Biotechnology" (2004-2005) Working Paper, European Law Research Center, Harvard Law School, online: <http://www.law.harvard.edu/programs/elrc/events /socialregulation.pdf> at 18.

[221] *Ibid.*

[222] Shaffer & Pollack *supra* note 124 at 23.

[223] *Supra* note 124 at 23

[224] See Heller & Escobar, *supra* note 46 at 162.

[225] Delaney, *supra* note 169 at 85.

the "domineering forms of reason, science and technology" that are exemplified by the very idea of the genetic modification of foods.[226] "Nature", according to these arguments, "is an ideologically saturated notion that is inscribed on aspects of reality to render them meaningful in particular, partial and not disinterested ways".[227] But as Delaney emphasizes, it is important to ask not what nature *is*, but what nature *does*.[228] And as was illustrated by this project in deconstruction, the result of labeling an object as "natural" can be both a moral injunction against technological intervention as well as an invitation "to render what is so inscribed suitable for domination."[229]

Nature is a trope for differentiation. [230] It places objects, processes in opposition to human or cultural artifacts. Law and science, in this paper, are viewed as key *cultural* domains from within which "meaning is mapped to the world" and to "nature". As Sheila Jasanoff has explained, we are "continually reinscribing the boundary between the social and the natural, the world created by us and the world we imagine to exist beyond our control".[231] "Nature" is a cultural category. Donna Haraway for example, has argued that the distinction between the social and the natural has become increasingly porous.[232] Opposition to GMOs can be understood as a site of resistance to this trend. GMOs embody what "many actors see as the commodification and technologization of nature, and as the loss of local autonomy over "natural" and cultivated environments in the face of global capital and genetic rationality".[233] They represent an opportunity for actors to draw a bright line.

Sheila Jasanoff & Marybeth Long Martello characterize the decade of the 1990s as "a long march toward doubt and uncertainty".[234] The power of science to quell controversy declined precipitously, and its knack for bridging "deep ideological and normative divisions" basically dropped off completely. They argue that the most pressing challenge facing global governance is the accommodation of *difference.* As globalization works to erase distance, in their view, governance structures must not only devise

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[226] Murray Bookchin, *The Modern Crisis* (Philadelphia: New Society Publishers, 1980).

[227] Delaney, *supra* note 8 at 17-18.

[228] Delaney, *supra* note 169 at 86.

[229] *Ibid.*

[230] *Ibid.*

[231] Jasanoff, Sheila, "Ordering Knowledge, Ordering Society" in Sheila Jasanoff (ed.) *States of Knowledge: The Co-Production of Science and Social Order* (Routledge, 2004) 13 at 21.

[232] Donna J. Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature* (Routledge. New York, 1991).

[233] Heller & Escobar, *supra* note 46 at 156.

[234] Marybeth Long Martello & Sheila Jasanoff, "Conclusion: Knowledge and Governance" in Sheila Jasanoff & Marybeth Long Martello (eds.) *Earthly Politics: Local and Global in Environmental Governance* (Cambridge, MA: MIT Press, 2004) 335 at 337.

mechanisms that transcend localism, they must do so in a way that confers respect on 'the local'.[235] They urge us to abandon the idea of globalization as an inevitable homogenizing force.

> Industrial societies, despite their many commonalities, articulate their needs and desires in different voices. Despite the ubiquity of CNN, Microsoft, and the Coca-Cola can – and the global homogeneity they signal – the din of multivocality rises rapidly as one leaves the havens of the Industrial West. Politicians and citizens in Washington, Paris, Tokyo, and Baghdad have met the challenges and dislocations of the present with disparate resources and divergent criteria of what makes life worth living. The world is not a single place, and even 'the West' accommodates technological innovations such as computers and genetically modified foods with divided expectations and multiple rationalities. Cultural specificity survives with astonishing resilience in the face of the leveling forces of modernity.[236]

Cross-cultural scientific exchanges or conflicts, such as the case under the microscope here, often reveal that scientific knowledge of nature is produced through, and reflects, highly particular and locally specific ways of knowing. Differences in regulatory approach can derive from differences in lived experiences (in the U.K. many have raised the legacy of the BSE tragedy as a primary factor in the public's opposition to GM foods[237]), from distinct histories, from cultural or intellectual traditions (others have pointed to the cultural symbolism of the British countryside as a haven for birds and wildlife).[238] Invoking a 'neutral'

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[235] Marybeth Long Martello & Sheila Jasanoff, "Introduction: Globalization and Environmental Governance" in Sheila Jasanoff & Marybeth Long Martello (eds.) *Earthly Politics: Local and Global in Environmental Governance* (Cambridge, MA: MIT Press, 2004) 1-29.

[236] Jasanoff, *supra* note 231 at 14. Michael Trebilcock would agree with this basic point. In fact, he argues strenuously that economic globalization cannot lead to a "global monoculture" because the "basic economic theory of international trade" states that "comparative advantage results from exploiting *differences*, not similarities in production" (his emphasis) (Trebilcock, "Critiquing the Critiques of Economic Globalization", Working Paper presented at the Hauser Global Law School Colloquium, "Globalization and its Discontents", NYU School of Law, March 2005. Others, such as Naomi Klein, argue that market-driven globalization does seek the extinction of "national habits, local brands and distinctive regional tastes" (Naomi Klein, *No Logo: Taking Aim at the Brand Bullies* (Toronto: Vintage Canada, 2000) at 129). Francis Fukuyama similarly worries about a global uni-dimensionalism, material blandness and homogeneity (Francis Fukuyama, *The End of History and the Last Man* (New York: Free Press, 1991).

[237] For example, the French daily newspaper *Liberation* described the arrival of U.S. transgenic soy in its ports as "Mad Soy Alarm" (November 1, 1996).

[238] On the explanations for regulatory divergences between North America and the U.K. with respect to food biotechnology, see Sarah Hartley, "A Comparison of Policy Responses to Environmental Risk: The Case of Agricultural Biotechnology in Canada and the UK", Ph.D. dissertation, University of Toronto, forthcoming. Other proponents of GMOs have suggested that the European Community's distrust of genetically modified crops is a remnant of the "mad cow" disease scare, and a generalized over-sensitivity to food safety. These observations tend to dismiss public concern as the product of an overimaginative and under-informed public. Consumer fear is said to be based not on uncertainty, but on misunderstanding. The message is clear: Fear of genetically modified crops is based on irrationality and ignorance, and an informed public would not have any anxiety in embracing genetically modified foods. Ironically, a survey in the United Kingdom showed that the survey group had a greater opposition to biotechnology after receiving a training course on the subject, hinting that ignorance may not in fact be the source of consumer skepticism (Matthew Rich, "The Debate over Genetically Modified Crops in the United States: Reassessment of Notions of Harm, Difference, and Choice (2004) 54:3 Case Western Reserve Law Review 889).

science to arbitrate such disputes, as the WTO regime attempts to do, is unlikely to quell controversy. In fact, Jasanoff and others have argued that the idea that a strict reliance on science will overcome "deep-seated and consequential divergences" within the global order, a fundamental basis of the *SPS Agreement*, is merely an illusion.

While trade disputes do not generally raise the temperature of the general public, disputes about food seem to inspire charged emotions. In some minds at least, and in some countries more than others, food is in a completely different category from other traded products.[239] "It is part of national and regional identity".[240] As David Byrne, the EC Health and Consumer Safety Commissioner has remarked, "for some member states" food quality is "nearly synonymous with sovereignty".[241] Thus it is not surprising that "the imposition of novel foods that challenge closely held cultural values is likely to be resisted".[242] Public reactions to risk are "deeply embedded in social structures and are powerfully shaped by notions of equity and legitimacy with respect to the institutions that are in place to ensure safety and reliability".[243] Further, while the 'voluntariness' of a risk has been demonstrated time and again to be an important determinant of the public's acceptance of risks, the notion of the WTO involuntarily imposing *food* on Europeans is a particularly powerful image. For example, when the U.K. government announced its plan to finally approve a controversial GM maize developed by Bayer, the *Daily Mail* (London) proclaimed "So we're going to be force-fed GM".[244]

As this analysis has demonstrated, the *SPS Agreement* continues to "invoke, and so to reinforce, the boundary between science and other forms of knowledge".[245] It is based on the misconception that the strand of discourse labeled science can be isolated from contextual influences, extracted and imported value-free into WTO disputes. It perpetuates the myth that the double helix can be disentwined, the

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[239] Even narratives of food, now, have come to be scripted in a genetic idiom. M.Susan Lindee, Alan Goodman, and Deborah Heath, "Introduction: Anthropology in an Age of Genetics" in Alan H. Goodman, Deborah Heath and M. Susan Lindee (eds.) *Genetic Nature/Culture: Anthropology and Science Beyond the Two-Culture Divide* (Berkeley: University of California Press, 2003). The authors go on to raise Abby Lippman concept of "geneticization" (Abby Lippman, "Led (astray) by genetic maps: the cartography of the human genome and health care (1992) 12 Social Science and Medicine 1465).

[240] Toby A. Ten Eyck, George Gaskell, & Jonathan Jackson, "Seeds, food and trade wars: Public opinion and policy responses in the USA and Europe" (2004) 10 *Journal of Commercial Biotechnology* 258.

[241] Lizette Alvarez, "Consumers in Europe resist gene-altered foods", February 7, 2003, NY Times online.

[242] *Ibid.*

[243] Maurie Cohen, "Environmental Sociology, Social Theory and Risk: an Introductory Discussion" in Maurie Cohen (ed.) *Risk in the Modern Age: Social Theory, Science and Environmental Decision-Making* (New York: MacMillan Press, 2000) 3 at 12.

[244] James Chapman, "So We're Going to be Force-Fed GM" 20 February 2004, *Daily Mail* [U.K.].

[245] *Supra* note 235 at 13.

scientific disentangled from the legal, the technical peeled away from the normative. Most importantly, the *SPS Agreement* ignores the role of culture in the perception and construction of risks.

The *SPS Agreement* rests on the shaky foundation of the assumption that the expert, technocratic, scientific view risk is inherently more 'rational' than public assessments of risk. More and more, according to Sheila Jasanoff, the notion that citizens are too simple or unsophisticated to understand and assess risks is being rejected. Lay judgments that are more risk-averse than those of experts are coming to be recognized as "reflecting different framings of technology's social implications, different perceptions of the feasibility of control, different appraisals of the values at stake, and different judgments about fairness in the distribution of risks and benefits".[246] Further, even trade law scholars are beginning to agree that if citizens place values on risks that depend on contextual features, and if these valuations are reasonable, then democratic principles would require that government action recognizes the relevant contextual differences, even where it may make the regulatory regime seem "inconsistent" to outsiders.[247]

I attempt in this work to expose some implications of the privileging of science by subjecting the submissions in the GMO dispute to a discourse analysis. Further, by critically articulating the points of connection between the two strands of discourse that constitute the "double helix" of international trade law, I aim to deepen perspective with respect to the concepts of risk and precaution that are gaining currency in contemporary governance debates. It has been my aim to offer a fresh way of looking at this problem that provides insight not by simplifying the issue into one suitable for doctrinal legal analysis, but by adding layers of complexity and exposing the "tangled politics" of an issue that squarely raises theoretical questions about the "co-constitution of nature and culture".[248] Law is seen a site of official contestation between rival framings. The Panel faces an adversarial contest in which the parties' seek official validation of both their construction of *nature* (and what may or may not find refuge within its bounds), and their view of the role for *culture* within the institution of global trade. A decision from the WTO Panel is now expected early in 2006.

[246] Jasanoff, *supra* note 211.

[247] Pildes & Sunstein, *supra* note 209 at 59. See also Howse, *supra* note 128 and Bohanes, *supra* note 127.

[248] Lindee et al, *supra* note 239 at 4.