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Back to Politics at Last

Orthodox Inertia in the Transatlantic Conflict over Agro-Biotechnology[*]

Franz Seifert (Universität Wien, fseifert@gmx.at)

Abstract

This study suggests that, despite the decisive function of scientific risk assessment in the regulation of potentially hazardous technologies, conventional political decision-making prevails if in protracted risk controversies scientific consensus cannot be achieved. An examination of Austria's policy on agricultural biotechnology is presented to illustrate this point: For a number of years Austria has been upholding national bans on various Genetically Modified Organisms (GMOs) even though these bans were deemed illegal by the European Commission as well as a WTO Dispute Settlement Jury. Since European and international regulations require restrictions on biotech-products to be based on scientific evidence, for the longest time the dispute between Austria and the European Commission, seeking to lift the Austrian ban, consisted in the exchange of scientific opinions. When international pressure against the Austrian ban rose after a WTO judgment censuring the Austrian measure, only a political solution could bring about a (still provisional) settlement. The process is discussed against the backdrop of sociological debates questioning the pivotal status of science in government.

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1 Introduction

A major part of the critical literature on the relationship between science and politics (otherwise known as science and technology studies or STS) takes issue with what can be called the "orthodox view" of science in political decision-making.[2] According to this view, science, even when intimately involved in policy and regulation, acts as a disinterested provider of objective knowledge, distinct and distinguishable from politics. Particularly in the case of risk assessment, which is the prerequisite for the approval of potentially harmful products, science provides the basis for a "factually grounded, objective, and value-free, analytic exercise" (Busch et al. 2004: 4) capable of properly identifying and assessing possible harm to humans and the environment.

For more than three decades STS have challenged this view as simplistic and misleading: Because science in government serves practical needs arising from regulatory requirements and political problems, it mostly operates in areas of ineradicable uncertainty and social contention, where consensus proves difficult to achieve, much more maintain (e.g. Funtowicz/Ravetz 1992). But even though numerous studies on science-policy interaction testify to the social malleability of scientific truth, how selective it can be or how bound up with tacit social considerations, authorities and legislations adhere to the orthodox view. There are three reasons for this.

In the first place, there is an unquestionable normative function of science in pragmatic matters of product safety and environmental protection: Even should uncertainty and disagreement remain, it will matter that standards or regulatory decisions have been based on scientific expertise (rather than, say, on opinion polls, exegesis, or horoscopes). Whether the issue is flu jabs or mobile phones, it is simply essential to know whether certain products are dangerous, or more or less dangerous than others. Furthermore, expert disagreement and scientific uncertainty vary from case to case. In a great range of technologies disagreement and uncertainty might be subliminal or even non-existent, so that most risks entailed by everyday life in Western society – e.g. traffic – can be defined and delimited technically without stirring up much controversy.[3]

In the second place, from a governance perspective, keeping science distinct from politics serves to maintain the legitimacy of political decisions. Regarding the handling of technical and environmental hazards the orthodox view's authority to generate legitimacy is exemplified by the distinction that is made between *risk assessment* and *risk management* in regulatory practice in the U.S. and the EU. The conceptual duality was introduced by a U.S. study in 1983 known as the "Red Book" (NRC 1983). Risk assessment refers to the exclusively *scientific* identification, explanation and evaluation of risks, and delivers objective, independent advice for the perfectly separate, *political* risk management

[2] I borrow this term from Millstone and Zwanenberg (2003).

[3] In cases where science working under value-neutral or „technical" conditions of undisputed knowledge, Funtowicz and Ravetz (1992) have proposed the terms "normal science" in basic research and "consultancy science" for established knowledge applied to defined problems, which they contrast with the "post-normal science" (a term initially introduced by Thomas Kuhn) that operates in politicised contexts of ineradicable uncertainty, most often in the context of applied, policy-relevant research. While in the emerging type of post-normal science traditional methodologies and practices of closure are deemed ineffective, "normal/consultancy" science gets along with conventional approaches. It should be noted, however, that STS authors leaning to a more constructivist view deny the viability of conventional or normal science altogether (e.g. Nowotny et al. 2001).

process whereby risks and benefits are traded off against one another, socio-economic consequences are envisioned and various interests are taken into account. Since the "Red Book", the guiding principle of U.S. environmental and product regulation has been to keep science separate from politics in public discourse, procedure and in institutions. In recent years, the principle has increasingly gained ground in the EU as well, in both supranational and national regulation. This is most conspicuous in the regulation of food safety, where, in the course of the past decade, a number of independent food safety agencies have emerged. Significantly, the differentiation between risk assessment and management initially came about as a response to a crisis of confidence: In the early eighties, U.S. environmental and job safety regulators had to cope with a loss of credibility due to concentrated industry litigation and various public and political pressures. In the EU major regulatory restructurings in the late nineties resulted from the BSE crisis (Lofstedt 2003). The dominant strategy to restore legitimacy on both sides of the Atlantic was to establish a clear-cut separation between values/interests and facts, and between politics and science.

The third reason for the predominance of the orthodox view, one which is often overlooked but which is, arguably, the most powerful one, has to do with the internationalization of regulation: In almost all fields where there is standard-setting and product regulation, states are required to comply with supranational or international regulations and standards. This is obvious for EU members, but it also holds for any member of an international standard-setting organisation or party to an environmental or trade agreement. International trade agreements based on the legal dispute settlement mechanism of the World Trade Organization (WTO) are particularly influential, as the power to impose trade sanctions acts as a strong incentive for compliance. Liberal trade rules, in turn, exclude barriers to trade other than such warranted by scientifically substantiated physical hazards. Supranational regulations and international environmental and trade agreements confer a pivotal role upon science by stipulating that product standards and product approvals be based on the best available knowledge and on scientific risk assessment. This implies that states, even if they prefer to base their decisions on alternative criteria, are required to defend their measures by means of scientific argument alone.

This lends a new, international dimension to the problem of achieving consensus. National measures based on national experts' evaluations and meeting with popular approval might be at odds with other, equally scientifically sound positions that other states or supranational institutions have adopted. In the case where there stand to be real, tangible implications, as, for example, in the case of trade disputes, conflict resolution is shaped by supranational regulations and international agreements which require decisions to be based on scientific expertise. The resulting international expert dispute is no more likely to be resolved through consensus than at national level. The legitimacy problems arising in these international techno-scientific disputes are even aggravated: Whereas common democratic understanding would suggest that where a population simply does not want to accept certain products and technologies they should not be upon them, states can now be compelled by international bodies to consent to products and technologies that have been cleared through scientific risk assessment.

The following study examines just such a new type of "nested" dispute which involves one state pit against other states as well as against supranational and international authorities within a legal framework that requires decisions to be based on science, to

wit the case of Austria's bans on genetically modified organisms (GMOs) in agriculture. For more than a decade Austria has been upholding such bans in defiance of the European Commission, which, having rejected the scientific basis for such measures, unsuccessfully has called for their abolition. The conflict acquired an international dimension when the U.S., along with Canada and Argentina, filed a lawsuit with the WTO against the EU's biotechnology policy, which the complainants considered to be in violation of international trade law. The principal targets of the lawsuit were the EU's "political moratorium" on GMO authorizations, in effect from 1999 to 2004, and a series of national bans on GMOs that had been approved for marketing in the EU beforehand. Austria was only one among various countries upholding such bans, but, for contingent reasons, it was the only country for which the conflict ever came to a head with the European Commission, after a verdict of the WTO Dispute Jury declared the national bans unlawful. Although the subsequent resolution of the conflict can be considered to have been political, the orthodox view remained unquestioned. This finding leads one to make the major claim of this article: in a protracted techno-scientific controversy where scientific consensus turns out to be unattainable, a political solution will be found in the end. That solution, in turn, will reinforce the orthodox view rather than challenge it. This observation becomes relevant when seen against the backdrop of current sociological critique of the orthodox view. It is not this study's concern to add to the already solid sociological argument proving the orthodox view wrong by highlighting persistent uncertainty and value enmeshment of science in government; nor does this study contest this view, which has been confirmed by many empirical accounts. Rather, this case stresses the unbroken power of the orthodox view, which it traces mainly to the web of supranational regulations and international agreements endorsing it and the compliance of affected states.

The following account of the international conflict over Austria's bans on agricultural GMOs examines the interplay of three modes of conflict resolution: scientific, legal, and political. While the types of disagreement they handle may be different, in the sociopolitical process under study they are nevertheless inseparably interwoven, or "closely coupled" (Weingart 1999: 157). The science mode of conflict resolution is used to settle differences about the nature of reality; in this instance the possibility or likeliness of adverse effects of biotechnology on health and the environment. Typically, this would entail scientific formats of communication and validity claims, such as empirical data, methodological designs, heuristics, hypotheses and theories. By comparison, the political mode uses political means – both formal (elections, votes, or other procedures) and informal (threat, persuasion, negotiation, diplomacy, etc.) – with the objective to arrive at authoritatively binding decisions. The legal mode of conflict resolution is operational in the routine case of procedurally organising the interplay of political and science mode of conflict resolution and where disputes need to be settled according to binding legal norms. The latter provide the framework for the arguments and procedures to be marshalled in legal mode conflict resolution.

For the purpose of this paper and the present, empirical exposition, the distinction of the three modes is an operational one. One is not seeking here to unveil the political conditioning, social bias, hidden assumptions, or blind spots etc. that are part of the conventional understanding of the relationship between science and politics. This has been convincingly done by a significant strand of STS. In particular, STS have expounded the problematic character of the science-

politics divide, which has been shown to be socially constructed in the pursuit of scientists' interests (Gieryn 1983), and to undergo reformulation and shift (Jasanoff 1987; Levidow et al. 2007).[4] Evidently, the distinction between independent scientific, legal and political modes of conflict resolution, as it is proposed here, goes along with the notion of state legitimacy based on a constitutional division of powers and, more specifically, with the orthodox view that there is a clear cut science/politics divide. Against the backdrop of decades of critical STS research, this might appear as a "naïve, pre-STS" understanding of science, law and politics. For the purpose of this article, however, these distinctions are made only in a provisional and non-normative sense in order to understand the consequences they have in a real world process.[5]

The paper is organized into eight parts, which loosely follow the chronological sequence of events. Following this introduction, section two will examine the regulatory internationalization of agricultural biotechnology and highlight the particular part the international regulatory framework attributes to scientific risk assessment. The third section outlines the course of the transatlantic biotech dispute and is followed by an account of the EU's response to its juridical outcome. The fifth part takes a closer look at Austria's recalcitrant biotechnology policy, which has important implications in both the EU and the international arena. The sixth chapter gives an account of the way in which Austria – and thus the EU – was (largely) brought back into compliance with WTO rules. The conclusion summarizes the course and outcome of the process against the background of current sociological critique of the orthodox view.

2 International Regulation of Biotechnology and Science-based Decision-making

International regulation of agro-biotechnology combines features of harmonisation and fragmentation. Harmonisation is the object behind major international agreements – most importantly the Cartagena Protocol on Biosafety (hereafter the Biosafety Protocol) and the Agreement on Sanitary and Phytosanitary Measures (hereafter the SPS Agreement). Both agreements have major implications for trade in GMOs and genetically modified (GM) products. The Biosafety Protocol, adopted in 2000 as an annex to the Convention on Biological Diversity, sets up a legally binding framework to enable member states to make informed decisions on the import of such organisms and products. The SPS Agreement, negotiated in the GATT Uruguay Round, aims to minimize trade barriers that had arisen as a result of national standards having been introduced to protect human, plant, and animal health. It commits members to annulling domestic regulations

[4] This is not to say that STS authors share a common view of the relation between science and politics. What most STS authors have in common, indeed, is a critical approach to way science has traditionally been seen to fit into politics, but disagreement prevails as to whether the ever more intricate interaction of science and politics – its "close coupling" (Weingart) – leads to a "blurring" of boundaries (e.g. Nowotny et al. 2001) or, whether alternatively, the functional differentiation of the two systems is maintained (Weingart 1999: 157; Weingart 2008: 139). In STS, unsurprisingly, the very definition of politics is also a matter of dispute (De Vries 2007).

[5] The distinction of scientific, legal and political modes of discourse is also consistent with the communicational output of social sub-systems in a Luhmannian system theory approach according to which science ultimately produces truth, whereas political decisions allocate power (Luhmann 1990, also compare: Weingart 2008: 139). While it is not this essay's specific purpose to follow the lines of this approach, this is not say that the same empirical account could not – in a separate analysis – be made a case for systems theory.

that could result in arbitrary discrimination.

The fragmentation of international regulation follows two fault lines: the first, between Biosafety Protocol and the SPS Agreement; the second, between the U.S. and the EU's regulatory systems. As to the first dividing line, tensions have arisen over the precise jurisdiction and scope of application of the Biosafety Protocol and of the SPS Agreement respectively: Whereas the Biosafety Protocol watches over ecological diversity and human health, the SPS Agreement is designed to minimize obstacles to trade. Furthermore, the Biosafety Protocol is based on a process-oriented, precautionary approach, whereas the SPS Agreement is product-oriented and requires trade restrictions to be based on scientific evidence of environmental and health hazards. That does not allow for restrictions to be introduced as a result of socio-economic, value-based considerations. Finally, in contrast to the Biosafety Protocol, the enforcement mechanism for which is still under discussion, the SPS Agreement is based on the powerful WTO dispute settlement mechanism. In the event of a legal clash it is obvious that the SPS-Agreement with its superior WTO enforcement powers would take precedence.

Another fission line is the regulatory gulf between the U.S. and the EU. The product-based U.S. biotechnology regulations do not presume the existence of any intrinsic risks, because no such risk has been demonstrated scientifically. The European regulations, by contrast, are precautionary in that risks are considered possible in the absence of scientific proof, and they support consumer choice. The two diverging regulatory trajectories are what have led to tensions in international regulation: the U.S. has clearly favoured regulation along WTO principles and has refused to become a party to the Biosafety Protocol, whereas the EU had become its champion in already back in the late 1990s (Falkner 2007).

The decisive role of science in international biotechnology regulation is a consequence of the normative function of risk assessment. In both the Biosafety and the WTO regulatory regime risk assessment provides the basis for decision-making (see also: Millstone/Zwanenberg 2003: 657). Risk assessment circumscribes the scope of scientific enquiry which ought to target physical risk, i.e. threats to human health and the environment. In theory, alternative criteria for restricting trade in GMOs are conceivable, e.g. in the form of ethical or socio-economic considerations, but these criteria are consistently kept outside the decision-making process. The focus on physical risk is obvious in the SPS Agreement with its free trade orientation, yet the same can be said of the Biosafety Protocol, where the precautionary approach only rearranges the relationship between policy discretion and scientific uncertainty but hardly addresses realms beyond physical risk. Thus, both approaches conform to the orthodox view (Seifert 2005).

In the orthodox view, the internationalization of procedures and standards using scientific risk assessment based on value-neutral, universally valid scientific expertise, ensures the international convergence in product approvals and prevents or resolves trade disputes. In actual fact, however, risk assessments conducted by national authorities often arrive at different conclusions. The transatlantic trade dispute on biotech products, which came to a head with Austria's ban on GMOs, is one paradigm of a trade dispute, which could not be pre-empted or resolved by science. The next section explores the detail.

3 The European GM Controversy: Science and Political Modes Fail

The ground for the trade dispute over biotech products was laid in the late

1990s when a number of European countries underwent public controversy over agro-biotechnology that ultimately forced the closure of the European market for GM products. From 1996 to 1999, particularly heated debate broke out in Austria, Greece, Ireland, Denmark, Italy, France, the UK, and Italy (Seifert 2006a). Public pressure caused most of these governments to tighten their national GMO policies even as scientific opinion on GMO risks increasingly varied. The ensuing controversy provides us with a demonstration of the "the interplay of science, law and politics" (Christoforou 2004) in practice.

In 1996, deliberations in member states' expert committees assigned with GMO risk assessment failed to produce a common or a clear majority position regarding the GM maize variety Bt176; the decision-procedure therefore switched from the scientific to the political mode. According to the "Comitology" of the EC Directive on Deliberate Releases (DRD), which prescribes the various interlinking of mandatory technical and political procedures, decision-making authority shifted to the Council of Ministers. The Council's vote on June 25th 1996 marked the start of the crisis of legitimacy which, ever since, has beset the EU's biotechnology policy: twelve member states voted against the proposal, two countries abstained, and only France, which had originally submitted the application, voted in favour. However, because a rejection required unanimity, decision-making authority reverted to the European Commission. The Commission consulted three of its scientific committees, all of which gave favourable opinions, and then proceeded to approve the GM maize for cultivation, notwithstanding the Council vote's narrow margin. From about that time on, national policies dogged EU harmonization goals. From 1997 to 2001, seven governments – those of Austria, France, Germany, Greece, Italy, Luxembourg, and the United Kingdom – issued bans on GM varieties that had been approved earlier for marketing in the EU. Beginning in early 1997, Austria and Luxembourg were the first countries to issue such a ban by prohibiting Bt176. In 1998, Austria banned another maize variety, and a third ban followed in 2000.

Article 16 of the DRD, the so-called "safeguard clause", provided the legal basis for the national measures.[6] Its provisions shift conflict resolution into the science mode, as they only permit unilateral bans to be imposed in the – supposedly – exceptional case of new scientific evidence having emerged that would demonstrate hitherto unknown risks. Member states are required to submit this evidence for evaluation to EU committees composed of member state representatives. Should this attempt at a scientific approach fail, which would be the case if the arguments presented by the member state enacting the ban were not in accordance with the opinion of the committee, the Commission would be required to submit to the Council a proposal to sanction the mandatory lifting of the ban by a qualified majority vote. (Thus, a return to the political mode.)

However, the policy process took a different and much more protracted course. In early 1997, after having enacted the ban, Austria (acting in the

[6] In the revised regulatory framework (compare Christoforou 2004), national safeguard bans for which there had been notification under Article 16 of DRD 90/220/EEC have to be dealt with under the safeguard clause provision in Article 23 of the amended directive 2001/18/EEC. Italy referred to Article 12 in the Novel Food Directive 258/97 to justify its bans. The text is modelled after the principle enshrined in the Treaties allowing for national product bans, in the event of a perceived threat to human health and the environment for which there had been no knowledge before approval. The orthodox view prevails, as the claim must be argued based on new scientific findings.

science mode) made the scientific case before the relevant EU scientific committees.[7] The committees concluded that the arguments did not constitute significant new evidence and that, therefore, the previous risk assessment should remain unchanged. Yet, when Austria, despite having had its plea neglected, still refused to lift its ban, the Commission hesitated over initiating Council procedure to demand Austria lift the ban. Arguably, the reason – a political consideration – was that opposition to biotechnology was meanwhile on the rise all over Europe. Most importantly, in 1998, France and Greece were putting in place safeguard bans; and in subsequent years, Austria was to decree two more bans, with Germany and the United Kingdom following later.[8] In each case, the science mode process was repeated: the scientific committees deemed that there was no new evidence to justify a reversal of the original authorisation. In each case – the only exception being the United Kingdom – member states ignored demands by the Commission to lift their bans, yet the Commission refrained from taking matters further, as the Council procedure would dictate. The situation, which neither science nor politics were capable to resolve, remained in limbo. Finally, in the summer 1999, the approval procedure came to a "political" end when, in the Council of Ministers, France, Greece, Denmark, Italy and Luxembourg declared they would block any future approval.[9] The move had a two-fold objective: first, it eased pressure on national governments reluctant to justify further market approvals before an unenthusiastic public; and, second, it aimed at putting pressure on the Commission with the ongoing reform of the Community's biotechnology regulation. The blockade, clearly and overtly, was a political act. It, therefore, came to be dubbed "political moratorium".[10]

Over the period from 1999 to 2003 and the completion of the revised regulatory framework (Christoforou 2004), member states were pressurizing the Commission to adopt ever tighter regulations in the form of cumbersome risk assessment and approval procedures, the internationally contested precautionary principle, and comprehensive traceability and labelling provisions which would make the introduction of GMOs into the European food chain a burdensome and – for applicants – risky business. In certain respects, however, the new regulatory framework was also to centralize and thus facilitate the approval procedure: in response to the crisis of confidence triggered by the BSE and other European food crises, the institutional distinction made between risk assessment and risk management (i.e. the science-politics divide) for food-product approval procedures was strengthened. A case in point was the creation of the European Food Safety Authority (EFSA) under the 2002 Food Law as an independent body conducting science-based risk assessments for the food approval process. For the authorization of genetically modified food the EFSA was assigned the key

[7] Austria cited possible effects of the Bt-toxin produced by the Bt176 on non-target organisms, the development of resistance to toxins by target organisms, and the risks associated with an ampicillin antibiotic resistance marker gene.

[8] In total, between 1997 and 2001, national safeguard bans had been decreed on 13 occasions by: Austria (3), France (2), Germany (1), Italy (4), Luxembourg (1), Greece (1) and the United Kingdom (1) (which was the only country to later withdraw its ban).

[9] At the expert level, the authorization process had come to a halt already in 1998. Later, in 2000 and 2001 respectively, Austria and Belgium joined the blockade group.

[10] In an account of the Council decision Morris and Adley quote a British official as having said: "The French Minister made it clear there was no legal basis for a blanket moratorium. What they were putting forward was a political declaration." (Morris/Adley 2000: 325)

responsibility of conducting the risk assessment, thus replacing national expert agencies. The EFSA also became the agency to turn to and, ultimately, the arbiter, when disagreements with member states over agro-food biotech's physical risks.

In April 2004, the moratorium ended with the Commission's eventual authorization of the first GM crop for six years. Previous to that time the moratorium had put the Commission in an awkward position. Commissioner Wallström, for example, had frequently stressed its illegality and appeals to reinstate authorizations remained unheard. Agro-exporting countries faced mounting obstacles as they sought to enter the EU market. From the late nineties onward the U.S. government was warning the EU to take legal action against the moratorium within the WTO. At the same time a number of transatlantic diplomatic (i.e. political) initiatives were launched to come to terms with the U.S. (Murphy/Levidow 2006: 46-97). In 1998, for instance, the Transatlantic Consumer Dialogue was created, a network of U.S. and EU consumer groups working together on the GMO issue with a consumer rights agenda. In 2000, the EU-US Consultative Forum on Biotechnology brought together a group of experts discussing strategies to avoid a transatlantic trade conflict. These efforts did not suffice. On May 13, 2003, the U.S., along with Canada and Argentina, filed a lawsuit in the WTO against the EU's "political moratorium" on GMOs. Thus, the conflict, which till then had been internal one between member states and the Commission, became transatlantic in scope. It was fought out in the legal mode.

4 The WTO Biotech Dispute: Legal Mode Conflict Resolution

The dispute settlement process turned out to be highly controversial, reflecting the high stakes involved. There was a great deal of speculation about punitive tariff duties to be imposed on the EU forfeited for lost sales in GM products in case of a WTO decision in the plaintiffs' favour (Gow 2006). The question arose as to whether such a case would call into question the entire EU regulatory system's compatibility with WTO free trade rules. The process was keenly observed throughout the world. Governments and regulators in developing countries regarded it as a precedent for eventual GM trade conflicts involving developing countries. Critical civil society organisations repeatedly highlighted the WTO's legitimacy problems throughout the process and "condemned its implicit aims: to force agbiotech products on an unwilling world, and 'to frighten off other nations' from developing their own safety regulations, especially precautionary ones." (Murphy/Levidow 2006: 168)[11]

High stakes, public salience and the complexity of the issue made for a protracted procedure. Only after lengthy debate among involved parties was a dispute settlement of three professional staff members set up in March 2004 to adjudicate the dispute. A request by the EU to have called in scientific experts, and several submissions during the proceedings by both parties led to further delays. While a WTO Dispute Panel normally takes a year to hand down its final verdict, in this case it took until February 2006 before the eagerly awaited interim report was produced, and another eight months for the final version to come out.

The advocacy strategies on the part of complainants and defendants differed in particular with respect to science. While the U.S. insisted on a narrow, legalistic interpretation of what they

[11] The bite-back campaign kicked off by the environmental NGO Friends of the Earth International, for example, resulted in a protest signed by 135.000 people and over 740 organisations claiming to represent 60 million people (FoEE 2005).

denounced as unscientific, protectionist barriers to trade, the EU's defence focused on scientific uncertainty and ambiguity (ibid: 161-173). The U.S. denied that the WTO Dispute Jury needed to look into the scientific aspects of the case, because the fact that the EU was reluctant to recognize the findings of her own scientific committees constituted an apparent procedural failure, causing "undue delay" in product approvals and, therefore, was in violation of international trade law. The EU, by contrast, sought to present its handling of the issue as in accordance with the precautionary principle and put to the panel the matter of scientific uncertainty. The EU's expert consultations, for example, helped to point up the scientific disagreement over GMO risks. The EU also attempted to broaden the ruling's legal basis to extend beyond the SPS Agreement and to consider other agreements such as the Biosafety Protocol and relevant Codex standards.

In November 2006, the Panel issued its final report. Significantly, it stressed that it did not examine scientific issues such as the safety of biotech products or their "likeness" (the technical term for equivalence in terms of toxicological and nutritional properties) to their conventional counterparts. Nor did it insist on a standardized procedure for risk assessment or that risk assessment was to be based on mainstream scientific opinion. The reasoning remained within a purely juridical reference system. The Panel also stressed that it was not ruling on WTO-compliance for the EU biotech regulations in their entirety. Essentially, what the report did do was prove the complainants right, finding that, with the blockade on GMO authorizations and the persistence of national safeguard bans, the EU was violating the "undue delay" provisions of the SPS Agreement. Approval procedures and scientific risk assessment featured prominently in the ruling. In its defence the EU had denied the existence of a moratorium, as there was no official document instituting a Community ban and authorization was being granted again by 2004. The ruling, nevertheless, stated that the EU had indeed applied a general ban in such a way that product authorizations were not being issued "without undue delay", and therefore the SPS Agreement was being violated. As to national safeguard bans, the EU sought to justify them as precautionary measures permitted under an SPS Agreement that grants members the right to adopt measures provisionally in the absence of sufficient evidence for a risk assessment to be conducted.[12] The ruling, however, said that available scientific evidence was actually sufficient. It is important to note that the Panel did not justify this verdict by invoking the science, which would have meant departing from the path of legal reasoning, but rather by citing the EU's failure to apply its own procedures properly (thus following the line of argument presented by the U.S.). The ruling argued that the EU's scientific committee had already assessed the potential risks posed by biotech products yet judged the products to be safe, thereby demonstrating that a risk assessment could be carried out. Hence, the cases presented by member states, none of which convinced the EU's scientific committees to reverse their positive risk assessment, did not amount to proper risk assessments as defined by the SPS Agreement. The panel did not make recommendations regarding the EU's general moratorium, because that had already come to an end in 2004,

[12] Article 5.7 of the SPS Agreement entitles members to take provisional SPS measures "in cases where relevant scientific evidence is insufficient." This right is circumscribed by a number of provisions: the measure is thought to be provisional and has to be reviewed within a reasonable period of time; it must be adopted on the basis of available pertinent information; and members are obliged to obtain additional scientific information for a more objective risk assessment.

shortly after the establishment of the panel. As to the national safeguard bans which remained in force after 2006, the ruling demanded that the measures be brought into conformity with WTO law, by being revoked or by having a valid risk assessment provided.

In critical respects, the EU got off lightly with the WTO ruling. Most importantly, the ruling did not affect the new regulatory framework, which had been forged through a long, contentious process (Spongenberg 2006). Furthermore, as the moratorium had been effectively ended in 2004, claims for compensation were unlikely. Yet it was clear that the ruling would have an impact on member states with safeguard bans in place. In November 2006 the European Commission decided not to appeal the ruling, and in December it was announced that recommendations would be implemented in a manner consistent with WTO obligations (WTO 2008). Observers speculated that the Commission wanted to avoid a less favourable verdict on appeal and that it actually welcomed a ruling that strengthened its position advocating against national safeguard bans (GeneWatch 2006).

5 Impact on EU Biotech Policy: Back into Political Mode

Due to the "complexity and sensitivity" of the issue, the EU asked for "a reasonable period of time for implementation," and parties in the dispute agreed on a period of twelve months from the date of the adoption of the panel report (WTO 2008). The Commission made use of this time by engaging in political mode conflict resolution in two ways. On the one hand, the victors in the biotech dispute had to be accommodated; on the other hand, member states had to be urged to lift safeguard bans and, thus, to undo the last aspect of the EU's regulatory system that failed to comply with the WTO Panel's ruling. In the international political arena the complainant parties maintained their threat potential by reserving their right to impose trade sanctions or to launch another dispute to challenge the EU's regulatory system. The U.S., in particular, urged the Commission to advance trade in agricultural biotechnology products by fast tracking approvals for GMOs with commercial significance for the US, and to regularize the EU approval system by lifting the national safeguard bans that had been condemned by the WTO ruling (FoEE 2007).

Satisfying the challengers' demands by restoring the domestic order, however, would turn out to be difficult. The Commission had been able to deflect the charge against the EU moratorium by reinstating the GMO approval process by April 2004. But this hardly mitigated tensions with resistant member states. What was symptomatic of the policy's delicacy: all approvals granted from July 2004 until end 2009 would apply only to the importation and consumption of products as food or feed, but not to their cultivation. While accommodating importers' demands for market access, the Commission thus avoided the most controversial issue: GM crop cultivation.[13] Another symptom of strained Commission-member state relations was that none of the approvals since 2004 was based on a majority decision by member states through qualified majority votes in Council; rather, the Commission passed them through a legal default

[13] Between May 2004 and March 2010, 23 authorizations for GM were issued, 15 of which were to cover various strains of the economically significant GM maize, three of which were for GM rapeseed, two for soy bean, one for GM sugar-beet, cotton and potato respectively. The GM potato Amflora developed by BASF Plant Science, authorized on March 2nd 2010, is the first and – thus far – only GMO to be granted EU approval for cultivation. All other approvals hold for the importation of the GMOs and their uses for food, feed and industrial processing. (GMO compass)

procedure. This implies that each approval was issued against the will of a considerable portion of member countries. Yet the lifting of the moratorium and the reinvigoration of GMO authorizations went some way towards satisfying the complainants' grievances.

The thorniest part was to be the abolishment of national safeguard bans. For a long time national bans remained the butt of U.S. criticism. The threat of U.S. trade sanctions did nothing to enhance the Commission's legitimacy in its attempts to have national measures lifted. On the contrary, some member states imposed new bans. The Mon810 maize variety – the only GM crop cultivated in the EU after having been authorized in 1998 – was banned by Hungary in 2005, by France in early 2008 and by Germany in the following year. The U.S. fiercely denounced these new measures but, since they had not been at issue in the WTO case, the Commission was more concerned to meet the formal requirements of the WTO-ruling by having the bans issued before 2003 removed. These attempts repeatedly failed. In the summer of 2005, still some time before the ruling, the Commission suffered a first defeat when the Environmental Council foiled its attempt to initiate legal action against Austria, France, Germany, Greece and Luxembourg for having maintained their bans in disregard for the opinion of the EFSA which had since become the chief European body conducting and evaluating GMO risk assessments.

A second attempt at political conflict resolution failed in late 2006, which was even more surprising, as by then, there remained but one country to be brought into line: Austria. In 2006, Austria was the only country with GMO bans on products that had been the subject of the WTO complaint and still actively being marketed. In other cases the companies manufacturing GM crops targeted by safeguard bans had withdrawn them from the market (Reuters 2006).[14] When Austria handed over the rotating, six-month EU presidency to Finland in July 2006 the Commission became free to try again to get the Austrian bans lifted. On 18 December 2006, however, the Council not only proved reluctant to support the Commission's proposal to have Austria lift the two bans (with only the UK, the Netherlands, the Czech Republic and Sweden backing the move) but voted by a weighted majority against it. The outcome demonstrated the wide support for the recalcitrant member country and forced the Commission to withdraw the proposal and reconsider its strategy. While it was clear that Austria would have to drop the bans sooner or later, because they violating WTO rules thus straining transatlantic relations, simply reissuing the same demand over and over was not going to work either. Austria had become the country to tip the scale in the transatlantic biotechnology dispute. Yet before turning to the further protracted attempts to resolve the European GMO dispute, that grew into transatlantic one, let us take a closer look at the Austrian story within the larger European picture to ask three questions: What are the reasons for Austria's obstinate rejection of GMOs? How did Austria defend this position? Why has it been it successful for so long?

6 Austrian Recalcitrance

Austria stands out among the EU countries opposed to biotechnology. Austria was the first country to go through an intense political debate over GMOs; it was (together with Luxembourg) the first to challenge the EU authorization process by issuing a ban; and it has issued more bans than any

[14] The two GMO maize varieties at issue were: MON 810, marketed by the U.S. company Monsanto and banned by Austria in 1999; and T25, marketed by the German group Bayer and banned in 2000. The first GM maize variety prohibited by Austria, Bt 176, was no longer a problem as it had been withdrawn from the market.

other country; Austria had three bans on GM maize varieties before the Dispute Panel ever commenced operations, and after 2006, Austria banned two varieties of GM rapeseed and another GM maize variety.[15] What was Austria's so obstinate GMO rejection about?

In 1997, after a heated public controversy, a popular initiative demanding the prohibition of agro-biotechnology overwhelmingly succeeded. The first safeguard bans were decreed around this time and, from 2000 on, Austria supported the European moratorium. In subsequent years Austrian agricultural policy took on a prohibitionist slant in an attempt both to protect the high proportion of organic farmers and reap the more general benefits of a national GM-free marketing niche strategy. Today Austria is pursuing a policy of zero-tolerance to GMOs in food and agriculture, which, after more than ten years of policy evolution, is consensus among stakeholders and political parties. In short, there is a very strong political will to keep the country "GM free".

How does Austria defend its stance? While remaining within the orthodox perspective, we distinguish between political and scientific tactics, and detect a clear predilection for the latter: Time and again, Austria has sought to influence EU decision making processes through political channels, and yet scientific argument has comprised the major focus of Austria's anti-GMO policy in the EU context. Politically, Austria has acted in various ways: e.g. by lobbying member state governments prior to Council decisions, by allying, however hesitantly, with the group of governments behind the political moratorium, or by kicking off critical debates on agro-biotechnology in the EU. For example, Austria attempted to win over Council decisions at the Council's vote on Bt176 in June 1996 (Seifert 2002: 220-1). As to the promotion of critical debate throughout the EU, the Austrian government declared biotechnology a major focus of its EU presidency, which ran through half of 2006 (Pröll 2006). Austria launched a debate on the EU approval process at the Council of Environmental Ministers in March 2006, targeting the EFSA's risk assessment practices in particular.[16] During its term in office Austria also hosted two major EU conferences on the precautionary principle and on the possible coexistence of GM- and non-GM agriculture.

As these examples suggest, even pursued in a political manner, Austria's struggle very much centred on scientific aspects of the EU approval procedure, such as the EFSA's risk assessment practices or the precautionary principle as a concept of regulatory science. However, the actual scientific dispute between Austrian experts and the EU's scientific committees (or after 2004 the EFSA) over biotechnology's risks dominated Austria's defence of its anti-GMO policy. The reason has been outlined already: EU regulations exclude but these arguments from entering the debate. It took a while for Austrian authorities to learn to play by these rules. For example, in the public furore, which preceded the popular initiative people were very quick to seize upon the idea of completely banning GMO releases but they were countered by government leaders who argued that such a ban would violate EU regulations and therefore be untenable (Seifert 2002: 169). The beleaguered Ministry of Health – the authority responsible in this case – decided to issue a ban nevertheless, invoking the DRD safeguard clause, which de-

[15] These more recent bans apply to the GT73 and Ms8xRf3 rapeseed varieties (April 2006 and July 2008 respectively) as well as the MON863 maize strain (July 2008).

[16] Ever since the approval process started up again in 2004, the EFSA has consistently attested to the safety of GMOs and rejected member states' risk claims as scientifically unfounded.

manded that new scientific evidence of harm be presented to justify the ban. Although EU scientific committees subsequently termed the Austrian case insufficient, Austria maintained the ban. Table 1 illustrates the course of the scientific dispute between the Austrian the EU experts taking the example of the GM maize variety T 25, one of the two GM maize varieties that had been at issue at the Council in December 2006.

Table 1: The scientific dispute over the GM maize T 25 between Austrian experts and the EU´s scientific committees

22 April 1998	The Commission authorizes marketing of T 25.
8 May 2000	Austria declares its provisional ban on T 25 and submits scientific reasons for the decision.
20 July 2001	The Scientific Committee on Plants refutes the reasons given by Austria, yet Austria maintains the ban.
January-February 2004	Austria submits additional information to the Commission in support of its ban.
8 July 2004	The EFSA rejects the reasons given by Austria, yet Austria maintains the ban.
26 April 2005	The Commission proposes the Council ask five member states to lift their bans, Austria among them.
24 June 2005	The Council rejects the Commission proposal by a qualified majority. The Commission is asked "to gather further evidence on the GMO in question."
November 2005	The Commission consults the EFSA again.
29 March 2006	Again, the EFSA fails to find reasons to revoke the original decision.
10 October 2006	The Commission proposes the Council ask Austria to lift its bans.
18 December 2006	The Council rejects the Commission proposal by a qualified majority.

Even though, in the mid 1990s, empirial research on GMO safety was virtually nonexistent in Austria, sociological research has shown that Austria was well equipped to put forward scientific argument in support of its bans. Even before public pressure had built up in the mid -1990s, the Austrian Federal Environment Agency (UBA), which was responsible for providing the scientific expertise to assess GMO risk, had established its own rigorous "Austrian standard", which acknowledged the limits of contemporary methods of contemporary risk assessment, or, more to the point, the uncertainty over long-term effects on ecosystems (Torgersen/Seifert 2000). Accordingly, rather than seeking to convince by providing new scientific evidence of environmental risk, the Austrian approach stressed the inherent "unknowns" in the original assessments and questioned their scientific basis (Ely 2005).[17] Over the years the Austrian government expanded its ranks of experts and broadened the scope of potential risk and uncertainty

[17] While this type of argument, focusing on unknowns, methodological flaws, and uncertainty instead of "new evidence", never convinced the EU scientific committees or the EFSA or the Dispute Panel, both regulatory reform in the EU and, ironically, the EU's line of defence in the WTO followed these same lines. Austria, for example, advocated environmental monitoring, questioned assumptions as to the comparability of GMOs with their unmodified counterparts, and insisted on freedom of consumer choice through the labelling of GM products before any of these principles became guiding principles in the EU's regulatory reform (Ely 2005).

to be examined, commissioning numerous studies on, for example, the allergic reactions to or toxicology of GM food, the co-existence of GM and GM-free crops, or specific GM crops to be banned. Table 2. illustrates the evolution of Austrian expertise and related scientific debate on regulatory aspects of agro-biotechnology through scientific studies commissioned over the years by the Austrian Ministry of Health.

Table 2 highlights both the diversity of subject areas related to agro-biotechnology and the permanent interest authorities take in GMO risk assessment. We find a relatively high number of studies on the linked issues of organic farming, co-existence, and GM-free regions (nine out of 39 studies), while the highest proportion of studies (22 out of 39) deal with various aspects of GMO risk assessment. Without further detailing the scientific arguments chosen by Austria to defend its policy, this picture attests to the priority Austrian authorities accord to science in determining what to ban and, more particularly, in the dispute about GMO risk assessment.

The strength of the Austrian scientific case was what enabled them to keep their bans in place for such a long time, as that would imply that the EU

Table 2: Evolution of Austrian expertise on GMOs 1996-2007. Source: http://www.bmgfj.gv.at/

Year	Number of Studies	Topics
1996	1	Provision on social compatibility in the Austrian Genetic Engineering Act (1);
1997	1	Risk assessment in GMO field releases (1);
1998	4	Environmental risk assessment (1); GMO safety research (1); herbicide resistance in GMOs (1); GM herbicide resistance and organic farming (1);
1999	3	GM food risks (2); GM free regions in Austria (1);
2000	3	Risk assessment of GM rape seed (1); amendment of the EU DRD (1); GM-free crops as part of Austrian organic farming (1);
2001	1	GM-free regions in Austria (1);
2002	3	GM-free regions in Austria (1); evaluating substantial equivalence (1); risk assessment of GMO field releases (1);
2003	5	Legal implications of Austria's GMO ban (1); assessment of GM allergies and toxicology (2); environmental monitoring of GMO releases (1); co-existence of GM and GM-free agriculture (1);
2004	4	Risk assessment of GMO Products in the EU (1); agroecology of GM rice and GM cotton (1); assessment of human health effects of GMOs (1); monitoring of "GMO-contaminated" maize fields (1);
2005	4	Co-existence of GM and GM-free agriculture (1); GM food labelling (1); Biodiversity in GMO risk assessment und monitoring (1); ecological effects of GMOs (1);
2006	5	Risk assessment of antibiotic-resistance marker genes in GMOs (1); GM-free rape seed (1); risk assessment of GM rape seed (1); the role of precaution in GMO policy (1); GM corn (1);
2007	4	Risk assessment with regard to Austrian bans and WTO-Panel conclusions (2); GMO risk assessment (2);
Total	**39**	

scientific committees and the EFSA had accepted the Austrian arguments. They never did (Table 1). The key is rather to be found in the political context: no pressure was brought to bear on Austria during the moratorium, and even afterwards the Commission's attempts to force Austria to lift the bans foundered because of the lack of cooperation from member states with their own anti-GMO agenda or with a general reluctance to see a small country overruled by the Commission.

7 Back to Politics at Last: The – Partial – Lifting of the Austrian Bans

Past failures notwithstanding, in February 2007, the Commission renewed its campaign to restore WTO compliance, this time asking the Council to require Hungary to end its ban on the MON810 GM maize. Yet again, member states rejected the proposal by a qualified majority. Even three defeats in a row, however, could not sway the Commission in its normalization policy. While Hungary's ban, which had been in force since 2005, was not subject of the WTO lawsuit, the Austrian bans remained the major obstacle to formal WTO compliance. Since the Commission's hands were tied to repeat its bid for a complete abolition as a consequence of the Council's rebuff in December 2006, a new strategy had to be found to overcome the last, Austrian, impediment to compliance.

Conflict resolution along political lines resumed in both transatlantic and internal EU-relations. The US kept pushing for improved market access, the Commission went on pushing through GM product authorizations, albeit with difficulty. While market access remained the complainants' major concern, the Commission did emphasize that Austria's safeguard bans, would have to be repealed since, however economically insignificant, they constituted the last remaining formal obstacle to WTO-compliance. The Commission submitted a revised proposal on Austria's ban to the Council in October 2007. This time, the proposal was to remove Austria's bans on the import and processing of the two GM maize strains alone, but not on cultivation. This modification combined three political considerations: firstly, the Commission would have to submit a revised proposal, as their two previous proposals for the complete rescinding of national bans had been rejected beforehand. It was unthinkable that the same procedure could ever achieve the desired result; secondly, as there was scant interest in cultivating GM crops in a small country like Austria, the opening up of Austria's markets for GM materials intended for GM food and feed would meet importers key demands; thirdly, as Austria's anti-GMO policy is primarily designed to prevent GMO field releases, even though tolerating, for instance, GM feed is allowed to be imported, the proposal would accommodate Austrian exigencies and would therefore be apt to gain acceptance.

Although the proposed Council decision of October 2007 failed again to muster a qualified majority in support, it was not opposed by a qualified majority either. Formally, this entitled the Commission to request the lifting of Austria's bans, yet also imposed the obligation to re-examine the issue. The vote's narrow margin and the sensitivity of the issue called for skillful handling. Austrian consent was crucial if a final showdown before the European Court of Justice, something which would only further strain the Commission's domestic legitimacy, were to be avoided. Diplomacy resumed both internally and in the transatlantic arena. When the time limit for restoring WTO compliance expired in November 2007, the complainants agreed on an extension until January 2008. Again, the EU missed the deadline, thus entitling the complainants to impose sanctions and, again, the US held off with punitive measures in order to pursue talks even

as they continued to criticize the still slow pace of authorizations and reserved the right to reopen the suspended arbitration process in the event talks not produce results (Bridges 2008).[18] Meanwhile, besides the differences among member states, increasing fault lines within the Commission were becoming a major obstacle to normalization. In 2007, Environment Commissioner Dimas declared approval for certain GM maize varieties would be blocked despite EFSA assessments that found GMOs to be safe (Mason 2007). Trade Commissioner Mandelson, by contrast, called on EU decision-makers to respect the EFSA's scientific judgement in order to avoid further international litigation (Reuters 2007). By early 2008, commentators were describing the Commission as having entered "uncharted legal territory" and being "at a complete loss" as to how to settle internal disagreements (Moravec 2008).

There were two questions on the agenda at the meeting on biotechnology policy in May 2008: the Austrian bans and the decision on three GM crops, which had been returned to the Commission after an inconclusive Council vote – like on every previous occasion since 2004.[19] While the deadlock persisted on the three controversial GMOs and the Commission postponed the decision, the executive body did manage to agree to demand Austria lift its bans on the cultivation of the two GM maize crops. By then, the Austrian ban, if of any relevance at all, was only a minor issue in transatlantic talks, as its economic significance was virtually nil. Rather, the complainants were pushing for a speeding up of the still slow approval process and were particularly angry over the recent French ban on GM maize. For the Commission, however, the removal of the last obstacle to formal WTO compliance was a significant step forward.

Austria agreed to a partial lifting of the bans it had maintained throughout a decade. In principle, the country could have ignored the decision and run the risk of litigation for non-compliance but, notwithstanding some criticism by Austrian anti-GM activists, the government chose not even to consider that option (Ruzicka 2008). Instead, it was stressed that the ban on GM crops remained in force, and that Austria would achieve its ultimate goal to prevent any GMO cultivation. This would be even the case in the event there should cease to be a ban on GM farming, inasmuch as a variety of domestic legal provisions and policy measures would have made Austria a most unwelcoming place for GMO cultivation in the future; e.g., in particular, strict national rules on the co-existence of GM and GM-free agriculture, and a voluntary GM-free policy of Austrian retailers (Seifert 2006b). Until now (early 2010) this "solution" of the problem of biotechnology recalcitrance proved viable, even though the Commission's obstinately refused to soften its legalistic-scientific position: To the surprise of most observers, in early 2009 the Commission started her, so far, last attempt to overthrow the remaining Austrian ban on cultivation. When the Commission asked member states' ministers at the Environmental Council in March 2009 to order Austria and Hungary to lift their bans, a qualified majority refused the motion. It was the third time that the Commission had failed to get Austria's bans lifted and the second for Hungary.

[18] In January 2008, Canada, Argentina and the EU first agreed to extend the "reasonable period of time" to February 2008. In February 2008, they agreed to a further extension until June 2008. In June 2008, the deadline was pushed back to December 2008 (WTO 2008).

[19] The two GM maize varieties 1507 and Bt11 and the GM potato Amflora. The Commission approved these varieties not earlier than March 2010.

8 Discussion: Inertia by Compliance

To date Austria and the European Commission seem to have come to an uneasy compromise, which, although the Commission has not given up its position, carries features that serve both sides interests. In Austria, the partial lifting of the ban is likely to meet with public approval, as it does not threaten the country's zero-tolerance policy; the Commission is happy, because the measure – however irrelevant economically, and however much overshadowed by a number of subsequent bans introduced since 2004, – does usher in a return to formal WTO compliance. The key point to be made here is that this arrangement was arrived at by pursuing both a legalistic and a politically sensitive track for conflict resolution, i.e. adjudicating, voting, lobbying, diplomacy, negotiation, rather than scientific deliberation. (Nonetheless science and the law still remain the Commission's principal sources of legitimacy. We also recall that the use of the threefold distinction between law/politics/science made in this contribution is not apt to an essentialist or prescriptive reading, neither it is thought as an opinion in the intrinsic STS debate about the very nature of science in politics. Rather, this essay has adopted a "naïve" notion of law, politics, and science to be used provisional manner in order to make sense of a real world process.) This finding supports the more general argument that if, in the context of a liberal framework, decisions are required to be based on science yet consensus on technological hazards proves beyond reach, a political solution will be found. Its substance, we might add, will crucially depend on the set of formal and informal rules that apply and the distribution of power in a given situation. In this way the issue is kept in check and any crisis of legitimacy is thus adverted, while the framework and the central role it assigns to science remain unaffected. In other words, liberal risk governance relying on scientific consensus ultimately withstands the challenge of persistent lack of scientific consensus. This may seem a truism, but it is nevertheless worthy of note in the context of prominent STS criticism challenging the orthodox view.

A letter to the WTO Dispute Jury Panel from a group of academics of considerable renown in the social studies of science and technology provides a model of such criticism (Busch et al. 2004).[20] Stressing the high stakes of the transatlantic dispute for "the global development of agricultural biotechnology, the democratic governance of risks in world trade, and, not least, the legitimacy of the WTO as an institution of global governance" (ibid: 7), the scholars warned that a ruling that was solely based on the criterion of scientific risk assessment would both misinterpret the mandate of the WTO agreements and imperil the WTO's democratic legitimacy. It was therefore imperative to go beyond a purely technical notion of risk to embrace "a more complex understanding of risk assessment as practiced in real-world conditions." (ibid.) According to the authors, sociological research had called into question the orthodox understanding of risk assessment as a "factually grounded, objective, and value-free, analytic exercise." (supra) Conventional accounts of risk assessment were problematic because of several omissions: firstly, there is the

[20] The letter came about through the formal mechanism of the "*amicus curiae* brief", a provision in the dispute settlement procedure by virtue of which civil society actors have a possibility to make their opinion heard in WTO dispute resolution. In the case at hand this involved a concurrent view on the part of five highly influential experts whose "scholarly expertise is in the areas of risk and regulation, with individual competences in environmental law, international trade law, scientific advice, comparative studies of risk assessment and management, public understanding of science and technology, and food and agricultural policy (Busch et al. 2004: 8).

disregard for problems arising out of scientific ignorance; secondly, there is disregard for how national contexts and scientific and cultural contingencies influence risk assessment practices; and thirdly, there is disregard for "background assumptions and value commitments that are unavoidably embedded within scientific knowledge generated for policy applications." (ibid: 5) The authors therefore pleaded that the WTO Dispute Jury: 1) begin by expanding the range of scholarship considered relevant in decisions related to aspects of risk assessment, especially by including the social sciences; 2) go on to acknowledge that practices of risk assessment vary according to the national and institutional context and are therefore limited and partial; 3) allow public deliberation and review to be part of risk assessment; 4) understand the EU's slow-down in GMO approval rates as the consequence of such an expanded notion of risk assessment under conditions of uncertainty and public contention, rather than as "undue delay" in trade-relevant decision making; and 5) refrain from any judgement over the substantive merits of the parties' risk assessments (ibid: 6).

The point here is not whether this academic intervention had any direct effect on the case's outcome;[21] rather, the statement summarizes an important sociological critique of the orthodox view and applies this critique to the conflict at hand. (It should be stressed that this critique must not be misinterpreted as calling for the abolition of science in political decision-making; rather, based on thirty years of social research into the value-laden character of science in politics, it is to be understood as a plea to admit that non-scientific factors unavoidably operate in risk assessment; to abandon the belief that science speaks universal and objective truth; and to give up the fiction that science and politics are perfectly separable – to the service of technocratic decision making and global market integration, we might add.) In a sense, the critique is confirmed by the course the process took. The same process, however, also attests to its practical futility. Thus, the fact that ten years of regulatory dysfunction, at times paralysis, had to pass before a political settlement was found, if only provisionally, because over the whole period consensus over GMO risks proved unattainable, only confirms the critics' chief argument, according to which risk assessment practices are constrained by political context, background assumptions, and value judgements. For these reasons there never was any rapprochement between Austria (or the other recalcitrant states upholding bans) and the EU's scientific committees or the EFSA (Table 1). It has been argued that the inclusion of scientific committees into wider policy networks involved in supranational political decision-making is an effective method of promoting policy deliberation (e.g. Joerges/Neyer 1997). Yet, to the extent policy deliberation means to generate consensus, thus workable solutions, in the case of agro-food biotechnology this interpretation does not hold. This is readily understandable since what is at stake in the scientific dispute over GMO authorizations is a yes-no decision: a positive risk assessment means approval, a negative risk assessment rejection of a given GM product. Hence, for either side, acknowledgement of the opponent's arguments implies policy failure. For the Commission in par-

[21] At least according to the Dispute Jury no such effect occurred. The only mention the jury made of this and two other *amicus* briefs in the over 1000-page report was: "We note that a panel has the discretionary authority either to accept and consider or to reject any information submitted to it, whether requested by a panel or not, or to make some other appropriate disposition thereof. In this case, we accepted the information submitted by the *amici curiae* into the record. However, in rendering our decision, we did not find it necessary to take the *amicus curiae* briefs into account." (WTO 2006: 285)

ticular, acknowledging Austria's arguments would have meant accepting there could be possible physical hazards and, thus, that Community authorizations would need to be withdrawn.[22] In sum, deep-rooted politicisation, profound scientific uncertainty (at least in the eyes of the technology's critics), and the ultimately binary logic of expert deliberations involved in product authorizations seem to preclude consensus which might be possible under different circumstances.

However, what the episode illustrates is not the political relativity (or malleability) of science in government alone. It also demonstrates the inertia surrounding the orthodox view when challenged and thus the unlikelihood of reform along the lines of "a more complex understanding of risk assessment as practiced in real-world conditions." (supra) With the sole exception of the last recommendation that one withhold judgement on risk assessment practices, the Dispute Jury's decision ran counter to all claims made in the intervention. The EU, actually, was found guilty of "undue delay" for formal reasons, and the ruling contained no advice for risk assessment practices along the lines proposed. Why has the orthodox view continued to hold sway?

As has been pointed out, the major strength of the orthodox view is that it has been enshrined in international free trade legislation, notably in the SPS agreement. Most importantly, the Dispute Panel's statutory reading of this agreement reaffirmed the orthodox view. In theory, there was scope for alternative readings.[23] The above-cited intervention, which allowed for cultural relativity, intrinsic uncertainty and the potentially democratic quality of risk assessment represents such an alternative. Yet, the authors were well aware of the difficulty in incorporating such reasoning in the Dispute Jury's judgment:

"WTO validation of multiple approaches to the assessment of particular products could, at best, cause delay for the larger project of regulatory standardization; at worst, it could open new avenues for protectionism masquerading as risk-based technology policy. A subtler version of this critique is that increasing the evidentiary burden necessary to establish a violation of the science-based provisions, or widening the scope of affirmative defenses, might decrease the sharpness of the SPS Agreement's anti-protectionist tools." (Winickoff et al. 2005: 121)

To dismiss the orthodox view clearly would run counter to the anti-protectionist mission of international free trade legislation. Adoption of the proposal must have appeared unlikely from the outset. That the authors did make the attempt nonetheless to convince the Dispute Panel was mainly because a radically different approach was needed to restore the WTO's tarnished political legitimacy. But political legitimacy, or the lack thereof, is a concept that is hard to pin down. In general, the "grounds for accepting or complying, consenting or agreeing to something" vary widely, ranging from coercion or apathy to pragmatic acquiescence and instrumental acceptance to factual or ideal normative agreement (Held 1996: 195). Leaving aside the theoretical assessment of the le-

[22] This explains the ironic fact that the EU defended its stance in the WTO suit by resorting to arguments similar to those of Austria, stressing uncertainty and the precautionary principle, yet, rejected the Austrian arguments in the internal dispute over safeguard bans.

[23] Foster, for example, suggests that a member should be able to defend SPS measures on the basis that its population simply does not want to run a given risk. In support of this view, she demonstrates that the SPS agreement, indeed, gives considerable scope for greater recognition of factors such as public opinion in decision-making about risks to human health and the environment (Foster 2008).

gitimacy of the WTO dispute settlement mechanism and its reliance on science, and turning instead to consider observable forms of compliance, we find the political legitimacy of the WTO ruling far from having been undermined.

To be sure, countless surveys and even a number of plebiscitary procedures have confirmed that most Europeans refuse to accept GMOs in agriculture and food and, as can be surmised, are particularly outraged if these products are forced on their plates through the WTO mechanism. This concern, however, has been fairly alleviated, given that strict EU labelling rules (unquestioned by the WTO) and European food industries' reticence towards GM-food keep the EU market virtually GM-free.[24] As far as agricultural biotechnology is concerned, GM crop cultivation is also negligible, and in part because of the same reasons, in part for the Commission's reluctance to authorize GMO cultivation.

Another way to gauge the legitimacy of the WTO ruling is to look into the conduct of state or supra-state actors subject to it. What became evident in the transatlantic conflict including the Austrian case-in-point, was the defendants' readiness to comply with both the ruling and the principles on which the ruling was founded. It is patently obvious that the Commission complied by accepting the WTO ruling, thus abandoning the arguments that had been used as a defence. As mentioned, the decision was not surprising, since the EU got off lightly with the ruling. In particular, the EU's major objective remained safe, i.e. the amended biotechnology framework. Consequently, the Commission did comply in that it sought to bring the EU's internal situation in line with WTO prescriptions. In a certain way the Commission also complied by adopting a defence strategy that focused on the scientific aspects of risk assessment (e.g. scientific uncertainty, differences of opinion among experts, the provisional nature of scientific knowledge, the precautionary principle) while sidestepping the dilemmas arising out of the socio-political context of risk assessment. In the EU's case such unresolved dilemmas led to regulatory paralysis as national experts and supranational scientific committees had become entrenched in their positions. In its defence before the WTO the European Commission reinterpreted this as precautionary policy.

In a similar manner Austria displayed compliance – a seeming paradox – as a means of defending a basically recalcitrant policy. This is reflected in the strategies Austria adopted to defend its safeguard bans, since, more consistently than in its political engagement, Austria chiefly pursued a scientific or regulatory defence. Earlier, regulatory experts had established an "Austrian standard", stressing the limits of risk assessment. Over the years the authorities commissioned a special body to provide precautionary expertise on strategic subjects (Table 2). Naturally, the defence kept silent about the "real" motives behind the country's zero-tolerance policy, such as, for example, the technology's extreme unpopularity, attested to by the popular initiative, or the clash with agro-political priorities. Superordinate EU regulations restrict the debate to these arguments alone. In sum, defendants did not question the legitimacy of the WTO, nor did they question the orthodox view underlying international risk regulation. The political solution that ultimately came to be applied to the amalgam of EU domestic and transatlantic tensions was designed to forestall further escalation of the dispute, one which truly had the potential to undermine WTO legitimacy. Thus, rather than subvert the

[24] By contrast, protein-rich GM soy-based animal feed is marketed in the EU on a large scale. As meat from animals fed on these products does not need to be labelled, this has not provoked any consumer backlash.

orthodox view, the (still provisional) political settlement, by striking a subtle balance between interests, actually helped to prolong orthodox inertia.

This study may provoke several questions. Although they reach beyond its scope, three of them should be addressed in order to stimulate further discussion and research. Let's begin with the crucial question: Is orthodox inertia unbreakable? Is the belief that risk assessment is a merely technical exercise, scientific expertise is objective and universal, and science can be perfectly separated from politics unalterable? Secondly, what lesson can STS draw from this episode? Thirdly, is there any evidence for policies, procedures, or institutions based on an "unorthodox view"?

As to the first question: Nobody knows. The future holds many surprises. Yet, it would be a true surprise if tangible decisional procedures based on "unorthodox" thinking would gain ground. The reasons have been given: firstly, the orthodox view of risk governance is functional and "works" in uncontested technological decision-making;[25] secondly, the separation of science and politics actually is a quite robust political legitimation-strategy. We might quote the common saying "politicians use science like drunkards use lampposts: not for illumination, but for support."[26] To present decisional procedures entailing science as based on politics alone, would do justice to sociological enlightenment but it also would deprive politics of a very helpful lamppost; thirdly and perhaps most importantly, the orthodox view is a key element of international free-trade legislation at both global and European levels. Even a deep crisis of legitimacy, such as the one on agro-food biotechnology, and a serious trade conflict between the major economic powers has so far not shattered orthodoxy. In fact, the orthodox view provided the common ground on which to play through the transatlantic dispute and prevented it from escalating into an even more damaging, or costly, confrontation. The expectation therefore: the orthodox view is here to stay.

Second: Which are the lessons for STS? For many years STS scholars and policy observers have been calling for a less rigid, more reflexive handling of the scientific advisory process, its democratisation and embracing of wider social demands (For a recent contribution see: Expert Group on Science and Governance 2007). Concepts abound and debate thrives both within academia and beyond.[27] The discourse of science reform clearly resonates with policy making: ELSA (Ethical Legal and Social Aspects) programmes, round tables, consensus conferences, ethics-committees etc. are well on their way to become regular features of emergent technology governance. This in turn raises a number of questions. For example, to what extent are these initiatives capable of substantially influencing policy trajectories driven by global state and industry competition? What is their normative basis? Can the social (disputed) function of science be maintained in cases where non-scientific or non-certified expertise is allowed to permeate expert-advice? The issue highlighted by the present

[25] The Expert Group on Science and Governance (2007) stresses that only certain technologies in rather exceptional cases provoke social controversy: "(…) *We do not share the view that public mistrust is pervasive, indiscriminate and dominant. The much more typical examples of everyday public trust in science are almost unseen because they are so taken-for-granted, leaving high-profile exceptions like the GMOs or* MMR (Measles, Mumps and Rubella, added by author) *issues to misleadingly define the whole terrain."* (81, fn 35)

[26] The original aphorism, attributed to Swiss chemist Hans Kuhn, did not refer to science but to statistics.

[27] Note, for example, the normative debate on the call to give a voice to uncertified expertise in policy-relevant science (e.g. Collins/Evans 2002).

case presents yet another problem for the reform of science in policy that should, in my view, be addressed more clearly. It deals with scale: as the orthodox view is a key feature of international free-trade legislation, it is a major pillar of an international order operating on liberal principles and, thus, a manifestation of a global power structure. It is this that primarily explains orthodox inertia in the face of massive public and academic critique. To dilute orthodoxy would run counter to most powerful corporate and national interests. One conclusion for STS should therefore be to bring into view more clearly the macro-structures of international relations. Combining macro- (international), meso- (national), and micro- (risk expertise in social context) perspectives could bring a better grasp of the operation of the orthodox view.[28] It could also help to gauge more clearly the relationships – mutually restrictive or reinforcing – of reform initiatives at macro-, meso- and micro-levels (Compare: Dahl 1994).

As to the educational mission of STS shared by many influential scholars in the field (e.g. Jasanoff 1996), it is probably wise not to overburden interventions such as the one presented with unrealistic expectations. To be sure, under certain circumstances reforms aimed at improving accountability and transparency in policy-relevant science can be realized, typically in an effort to cope with a crisis of legitimacy amidst social controversy. We have seen, for example, how the demarcation of risk assessment and risk management has been adopted in an attempt to cope with a crisis of trust, first in the U.S. and later in the EU. For reform-oriented commentators such situations of crisis are opportunities to promote their alternative agendas (e.g. Expert Group on Science and Governance 2007).[29] Yet, it appears unlikely that reform projects will triumph over the constraints created by a global power structure.

Finally: is there, nonetheless, any evidence of an "unorthodox view" materializing? Perhaps. While it is too early to say whether the latest, still ongoing twist in the never-ending story of agro-biotechnology heralds a deviation from orthodoxy, it is certainly worth looking at it: At the Environment Council in December 2008 member states expressed their dissatisfaction with the regulatory impasse[30] and asked the Commission to revise the authorization procedure so as to directly involve member states in the risk assessment process which the current framework delegates to the EFSA and the single member state proceeding the application. The Commission was also requested to take specific national or regional characteristics in precautionary decision-making into consideration. Furthermore, in the Agricultural Council on March 2009, the Netherlands urged the Commission to develop proposals for taking socio-

[28] Levidow et al. (2007) give a convincing example of how macro-, micro-, and nano-perspective can be united by combining concepts from the fields of STS and international governance.

[29] The conflict over agro-food biotechnology, certainly the most dramatic technological controversy in the past two decades, created such an opportunity. The Expert Group on Science and Governance (2007), for instance, quotes the GM controversy more frequently than any other "problematic" technology to make its case for a *general* rethinking of science and technology governance in the EU. Twelve times throughout the report the controversy is quoted as an example for a crisis of legitimacy and the fallibility of conventional approaches to risk assessment (Pp. 15, 33, 55, 57, 65: fn 31, 67, 68, 79, 81: fn 35, 82, 83, 85).

[30] Since the lifting of the moratorium, not a single GM product was authorized by the Council. Authorizations were always given by way of Commission decision, even when a majority had voted against them. Member states, in turn, had frustrated all Commission attempts to lift national bans. Furthermore, in April 2009, Germany became the sixth country to issue a safeguard ban on a commercial GM maize variety.

economic dimensions into account. In March 2010, the Commission announced to come forward by summer with proposals to combine the science-based approval system with member states' rights to decide whether or not they wish to cultivate GM crops on their territory. To devolve decision-making power back to member states could alleviate frictions between them and the Commission and send cracks into the orthodox framework: if national experts were more strongly involved in EU risk assessment procedures, a greater variety of perspectives could be taken into account; the consideration of regional aspects might generate a much more nuanced risk map and rectify the belief in universal valid science; if socio-economic considerations were admitted into the list of restrictive criteria, this might open the door for (explicit) value judgements within assessment procedures. Certainly, the expectation from this analysis is that orthodoxy will prevail. Let's wait and see.

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