GMOS, RISKS, REFLEXIVITY, AND CHANGE IN FRANCE AND IN CANADA

GMOS, INSTITUTIONAL RISKS, SOCIAL RISKS, REFLEXIVITY, AND CHANGE

A COMPARISON OF FRANCE AND CANADA BETWEEN 1980 AND 2001

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CHRISTINE CHIASSON, B.SC. A., M.A.

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AUTHOR: Christine Chiasson, B.SC. A., M.A. (Université Laval)

SUPERVISOR: Professor William D. Coleman

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ABSTRACT

What is the political role of risk? What is its role in the power structures of today's societies? And how can understanding its role lead to a better understanding of political change? This research is inspired by the students of late modernity who argue that the way we are dealing with risk is nowadays structuring culture, society and politics. According to these conceptions of late modernity, risk and political change are closely intertwined through the idea of reflexivity, a process of self-confrontation of a society with its own rules and institutions. Reflexivity, it is argued, will likely happen and bring change if and when risk-related discourse comes to reach the public sphere and comes to dominate public discourse. This study builds on this theorization of risk and aims to discover why France and Canada, even though they were facing similar technological challenges, were progressively taken along different paths when it comes to regulating GMOs. This study has found that major differences in risk related discourse and in the strategies adopted to manage social risks are factors in explaining different policy outcomes. In addition, it shows that differences in institutional risks management also contribute to the explanation. The comparison of the French and Canadian cases has indeed revealed that, if risks can create significant pressures in favour of institutional and political change, governments may in turn possess the necessary leverage to prevent reflexivity. This comparative analysis exposed that this capacity to manage institutional risk by controlling discourse and preventing reflexivity is related to the characteristics of such core democratic institutions as the parliament, the public administration, the press, and civil society.

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CHAPTER ONE

Introduction, Outline and Methodology

When it was decided that biotechnologies would be the subject of my doctoral dissertation, the issue of genetically modified organisms (GMOs) was already becoming very much a center of interest for the media as well as a source public concern. Because it was rapidly gaining in importance in the public sphere and becoming a political issue, the scientific community was also increasingly turning its attention to the question. From a comparative perspective, the coming into the market of genetically modified organisms was creating heterogeneity of rules and policies across various countries, a situation that offered interesting analytical possibilities. I turned to compare two countries, Canada and France, which appeared to be responding to the challenge of GMOs somewhat differently. These diverging responses offered me a window to explore more broadly how states were responding to the globalized challenge of plant biotechnologies. But I had to spend some time reflecting upon which window of analysis would be distinctive on the one side and large enough on the other to gain a full appreciation of the challenges to public policy making posed by these technologies. The answer was to come from literature on risk.

On the recommendation of my supervisor, I read Ulrich Beck's *Risk Society*. From this pivotal work in the field emerged a set of questions which never left my mind and became the core motivation for this research: What is the political role of risk? What is its role in the power structures of today's societies? How can understandings of risk lead to differing responses in policies and institutions? Good or bad, these questions were to become central to my doctoral dissertation and the lens through which I was to look at GMOs. From Beck, I became interested in Anthony Giddens' idea of modernity. I was then drawn to Brian Wynne's idea of the expert-lay knowledge divide. Drucker and Coicaud also contributed to my thinking with, respectively, their ideas of knowledge society and self-reflexion. All these readings enriched my understanding of risks as social and political variables. They all drew me to theorize a process by which risks could be involved in motivating choices in political change. Most importantly, all these theoretical approaches directly or indirectly pointed in the direction of reflexivity, society's process of confronting itself, as a meaningful explanation for political and institutional change. Much later, the idea of institutional risk as developed by Henry Rothstein attracted my attention. This concept showed me a way to incorporate institutions and decision-makers as actors of a process where risk is the central focus. Defined as risks to organizations regulating and managing risks and/or risks to the legitimacy of their associated rules and methods, the concept of institutional risk allowed me to complete the conceptual model which I used in this research.

As I started to study and compare the question of GMOs in France and Canada, the research questions got more specific. If risk was a relevant variable to explain political change, were all conceptual forms having a similar impact? After all, if France and Canada were objectively facing a similar technological challenge, what then was progressively taking them along such different policy and regulatory paths? Were France and Canada experiencing similar social and institutional risks? Were governments reacting differently to those risks and why? Were they reacting differently because of structural differences or because of differences in the nature of risks? Were similar processes at play? This study has found that major differences in risk related discourse and in the strategies adopted to manage social and institutional risks help explain these different policy and regulatory outcomes. However, the analysis of the French and Canadian cases has shown that, if risks can create significant pressures in favour of institutional and political change, governments may possess at the same time the necessary leverage to prevent knowledge of risks to reach the public sphere and to come to dominate public discourse.

In France, GMOs came to be seen as embodying a powerful threat when the discourse about them came to be associated with a nefarious view of globalization and spoke of a threat to the national identity and the French way of life. It is this risk amalgam that came to dominate the public sphere and created impressive institutional risks for the French government, French public institutions and even scientific research institutions. In striving to preserve their credibility and legitimacy, institutions and the politicians at their head were pushed to accept and even promote significant policy changes in favour of more precaution and stricter rules. This acknowledgement of risks on the part of the authorities, and structural difficulties they faced in implementing change contributed to a transfer of credibility and, to a certain point, of legitimacy, to some of the opponents.

In Canada, a close partnership between the government and the life-science and agri-food corporations left little opportunity for opponents to push their argument forward in favour of stricter rules for GMOs. Opponents did try to link GMOs with environmental and health concerns but, contrary to France, were never able to articulate risks in ways that posed a challenge for the national identity or as a threat to common shared values as in France. Rather, the government along with corporations consistently pushed to associate GMOs with promises of considerable benefits in terms of economic gain, enhanced well-being for all Canadians and even national pride. Furthermore, the Canadian government recurrently used institutional risk management strategies to keep control of the debate and to keep the issue away from public scrutiny. Since little scientific data came to support the claim that GMOs were indeed threatening the security

of the population or creating environmental problems, it remained relatively easy for the government to sustain this strategy.

1.1 Conceptual approach

To go about studying risk as a social and political variable, the concept had to be operationalized and systematized. The conceptual and methodological framework presented in Chapter 2 conceives of risks as social constructs accessible through their description in discourse. Drawing on this framework, I divide risks into two broad categories: social risks and institutional risks. Social risks are the ones that the members of society come to experience directly and can be divided into five groups: risks to health, risks to the environment, risks to the economy, moral risks, and risks to the common shared identity. Institutional risks are those experienced as challenges to legitimacy by institutions and organisations managing risks as a consequence of their risk management decisions.

How could experience of any of those risks bring about change was the next question I faced. I assumed that the expression of social risks alone would not be enough to bring about political or institutional change. Rather, it is the subsequent questioning of the management of these risks through institutions that leads to pressures on decision-makers to introduce changes in policies, regulations, and even institutions themselves. The conceptual framework I have proposed divides the expression of institutional risks into three categories that could correspond to different degrees of erosion of trust and lead to a certain loss of credibility and legitimacy for those institutions involved in risk management and risk evaluation: 1) Should institutions be trusted for the methods they employ when it comes to managing risks; 2) should they be trusted in their overall capacity to manage risks based on these methods; 3) and should they then be trusted finally in their will to protect and promote the common good and common shared values? Drawing from this conceptual framework, I hypothesised that questions about the will to protect and promote the public good would put more pressures upon institutions than questions about their capacity or their methods; and that questions about the their capacity would have the potential to create more pressure on institutions and decision-makers than simply questions about their methods.

The examination of the Canadian and French case studies at the heart of this dissertation demonstrate that, if a certain gradation of mistrust in institutions does have an impact on the level of institutional risks experienced, public knowledge of these questions and the strategies adopted to deal with them can have a huge impact on the final policy

outcome. In other words, governments have some capacity to resist change but this capacity tends to decrease as risks become more publicly known and sufficiently serious that the very institutions in place for managing risks lose legitimacy. I also come to the conclusion that some governments and institutions have more leverage than others to manage institutional risks. Specifically, the degree of democracy in the policy-making process opens the door to closer public scrutiny of institutions. As public scrutiny leads to more questions, the very democratic character of the regulatory institutions becomes more open to debate. I argue that, in France and in Canada, differences in the nature and functioning of public scrutiny by the media, the parliament, the judicial system, the electoral system and the degree of independence of the scientific community from corporate and state institutions had a direct impact on these governments' capacity to manage institutional risks. A higher capacity to manage institutional risks can lead to a better control over the reflexivity process and be used to make sure that institutional change would not come onto the public agenda.

1.2 Methodology

This study is a cross country, diachronic comparison of the evolution of risks-related discourse about GMOs and political change in France and Canada between 1980 and 2002. The period between 1980 and 1994, before the public controversy started in any of those countries, is considered time-zero of the analysis against which the period between 1994 and 2002 is compared. This latter time period is characterized by the first approvals for the growth and marketing of plant GMOs and by a steady rise of the issue in public discourse. It is also a time of increasing controversy, when both governments had to adjust to higher levels of public consciousness of risks related to GMOs as the issue was steadily receiving more importance in the media. These two time periods and two countries were compared as to the risk content of the prevalent discourse, the evolution of the regulatory and legislative framework, the changes within institutional arrangements, and the changes in the composition and lay-out of the discursive network.

Genetically modified organisms (GMOs), a sub-category of the big family of new biotechnology products, was an appropriate case to study risk and its impact on political change. GMOs were a kind of technological hazard suddenly getting much public attention, and whose risk profile were being constructed and reconstructed in public discourse. The cases of France and Canada provided an interesting contrast because, even though they started off with similar economic goals, the governments of these two countries ended up reacting very differently to the challenge of potential risks from

GMOs. Using the method of differences, I hoped that a close examination of these two countries - two western democracies objectively facing similar biotechnology related industrial development goals and similar regulatory challenges - would bring some answers as to the role of social and institutional risks and their impacts on the political and institutional choices that were made by these countries. In fact, despite the many similarities between France and Canada in the early days of biotechnology development, these countries ended up adopting very different regulatory frameworks.

But to compare a unitary state belonging to the most institutionalized regional arrangement in the world with a federal state and taking into account their meaningful differences in culture, electoral systems, political structures, and legal processes presented methodological challenges. These variables had to be taken into consideration in the final conclusions because they impacted on each government's capacity to respond to risk and to accommodate or resist policy change.

Discourse theory offered an interesting lens through which I could study risks and GMOs. According to this theory, discourse is a system of signs that includes not only spoken or written messages but also actions or inactions expressing ideas, values or beliefs. For discourse theory, reality is a social construct accessible through its description made in discourse; and discourse, in turn, has an impact on how reality is understood and perceived. But what makes discourse theory so relevant in the studying of political change is that it suggests ways in which change could occur through discursive strategies, when actors and institutions strive to unify the discourse and to rally others to their own. The three processes it describes - equivalency, hegemony, antagonism – were indeed observed in the strategies used in France and Canada to try to win the public opinion battle. In sum, not only did discourse theory offer a workable definition of discourse, it also provided directions to follow when it came to assessing how discourse can contribute to the reflexivity process and bring about political change.

The combination of discourse theory and the analytical focus on risk led me to a certain methodological eclecticism. Indeed, the research design implied that a chronology of events would be built and that the role and influence of the different actors in influencing changes of policies in response to events would be clarified. Consequently, in order to better understand the process through which risks, as an element of the discourse, could bring about change, I had to draw a parallel between the evolution of discourse about risk and the trajectory of changes in policy-making, regulatory decisions, and institutional change. To build an historical account, I had to rely somewhat on a historico-institutional theoretical approach. In addition, in order to understand the role and influence of the different actors in this evolution, the study had to use elements of a network approach. In particular, I had to build an analysis of the discursive networks that emerged in the policy processes in Canada and France

respectively. The goal here was to try to better describe the network of actors involved in discourse building, and to compare their respective degree of influence and their strategies.

For this research, I drew upon a variety of primary and secondary sources including government reports, research reports, minutes of parliamentary hearings, speeches, reports from consultative committees, survey reports, reports commissioned by the parliament and also official letters commissioning reports and studies. In addition, documentary sources included information posted on web pages, press communiqués, and leaflets (from both interest groups and governments). A number of newspaper articles were also examined and elite interviews were conducted in both France and Canada. All these documents (including interview transcripts) went through a process of content analysis.

When it came to analyzing discourse in these various sources, depending somewhat on their content and target, information was extracted in layers in the following fashion. A first reading was done in order to extract historical facts and was used to draw a portrait of the evolution of biotechnology-related rules, policies and institutions over the years. A second reading identified relevant players and was used to draw a picture of the discursive networks and their respective evolution in both countries, including alliances and cooperation between groups and organisations. Here I sought to map out the networks of actors and organisations that were influential in the social construction of risks related to GMOs. A third reading was then carried out in order to extract the "risk messages" that emanated from these events and actors. These messages were examined using the analytical framework developed in chapter 2: Was the document or the actor referring to environmental, health, economic, ethical or identity threats; or was it questioning the methods, capacity or will of institutions or decision makers to promote and defend the population against these threats? Finally, a fourth reading focused on government responses to institutional risks. At the end of the process, these four layers of information were brought together in order to figure out the process by which changes had been introduced or avoided, the types of risks that had been the most influential in public discourse and the strategies used by the various different actors to try to influence discourse about risk. Ultimately, this analysis was to test the usefulness of the analytical framework, and the relevance of the concepts of institutional risks and reflexivity.

Because of their abundance - especially when the controversy was the highest (1994 – 2002) - newspaper articles went through a special process of sampling before being analysed both quantitatively and qualitatively. Two press reviews (and their methodology) are presented in appendices 5 and 6. The first one (appendix 5), is a

quantitative and qualitative review of newspaper articles in Canada and France between 1980 and 1993. Here, the choice of newspapers was contingent upon the availability of indexes. The second press review covers the years 1996 to 2001 inclusively. It is presented along with the methodology used in appendix 6. It covers two major daily newspapers in each country – *Le Monde* and *Libération* in France and *The Globe and Mail* and *La Presse* in Canada. Just as for other sources, articles went through a "layered" content analysis. These press reviews gave me a basis for a quantitative and qualitative analysis of the evolution of the discourse in the media. The quantitative data were used to measure the intensity of the debate within each country and served to measure and compare the evolution of this intensity through the years. The qualitative analysis provided precious comparative information about the evolution of the participation of the different groups within the French and Canadian discursive communities. It was instrumental in drawing a portrait of the evolution of risk (social and institutional) in public discourse. The qualitative press reviews were also an indirect way to evaluate the level of influence different players had on public opinion and discourse building.

In addition to the press reviews, a total of 88 semi-structured interviews were conducted - 36 in France and 52 in Canada - with key players from the industry sector, farm sector, the academic community, governments, environmental defence groups, and consumer organizations. In France, interviews were conducted mostly in Paris over a three week period between November 20 and December 6, 2001. In Canada, interviews were done over a period of 6 months from January 2002 to June 2002 in five Canadian cities: Ottawa, Winnipeg, Saskatoon, Toronto and Quebec City. Most interviews were recorded and transcribed. All who participated were made assured that the information would be used in a way to protect their identity. A list of participating organisations is available in appendix 2.

The interviews were used to gather perspectives on policy while probing for a deeper understanding of perceptions of globalization and the risks involved with the technology. Since most of the people interviewed were likely to contribute to both research goals, questionnaires were built to combine questions of both studies. Questions that were used for the present study covered 5 broad themes: nature of the respondents' participation in the biotechnology/GMO issue, the decision-making process, networking, consultation processes, and communication/information strategies. The questionnaires were adapted to take into account the particularities of the decision-making processes in France and Canada respectively. What is more, for each country, two versions of the questionnaire were prepared. One version targeted decision-makers and the other version targeted interest groups. The decision-makers and interest groups versions of the English questionnaire used in Canada are available in appendix 1.

To identify interviewees, I did a mapping of the actors that had an interest in and were active on the topic of biotechnology and GMOs. This topic being horizontal in nature, and the issue being controversial, the mapping revealed that numerous actors were, at the time, somewhat involved in discourse building and/or decision-making. In the case of government departments, government agencies and consultative committees, I used government directories and organization charts available on governmental web sites to identify relevant people within key organisations. Actors of the scientific community, interest groups and lobbying organisations were identified through the examination of diverse documents. These organisations were sometimes mentioned in media reports. In the case that they presented briefs to parliamentary committees, their names could be found in the list of witnesses. These organisations were also often listed as contacts to other organisations (Web links) so that the identification of one player could lead to the identification of many others. Sometimes, through a snowballing process, I was referred to other possible interviewees by those I had first contacted. All were contacted by mail or e-mail and asked to participate in the study. The introductory letter that was sent to the interviewees summed up the research goals, highlighted the importance of their participation and guaranteed them that the interviews would be used in an anonymous way.

As the total number of interviews shows, we were able to meet with representatives of most of the organisations that we contacted. Farmers' associations, government departments as well as environment and consumer defence groups offered great collaboration. Agri-chemical and life science corporations in France as well as in Canada preferred talking to us via their lobbying organisations. Food processors and distributors in France accepted to meet with us but their Canadian counterparts did not accept to give us an interview.

Interviews were intended to get an inside look at the structure and nature of the debate. Because the structure and nature of influences within the decision making and review process are not something that necessarily is available in public documents, interviews were meant to get precise information on lobbying activities, alliances, consultation processes, decision processes, and communication strategies. Interviews, we hoped, would be especially useful to get a more intimate understanding of the forces at play, strategies, and challenges facing interest groups and decision makers as they were dealing with GMOs. However, because the issue had become so controversial in France and was threatening to become politically embarrassing in Canada, we could sense that some interviewees remained very cautious about what they were saying to us. Accordingly, with a certain number of participants, we could simply not get any further than their official position. In these cases, we could not get information that was not already part of the public domain. The fact that interviews were recorded might also have

kept certain people on guard. Interestingly enough, we could sense that those who were the most willing to give us an inside look at the structure of influence, strategies and processes, were those who were not, at that point, being successful at influencing the discourse. This latter group seemed more eager to expose the reasons of their failure to influence decision-making, and to understand and make us understand the forces at play that they felt were (unjustly perhaps) too strong to counter. Consequently, in France, industry associations were the most vocal while, in Canada, environment defence groups and consumer associations in favour of stricter rules for GMOs showed a greater openness.

1.3 Overview of the Content of the Dissertation

The role of governments in discourse building was central to this study. Governments do send messages by the public policy tools they choose to adopt to deal with a given issue or by the actions they choose to take or not in relation to a given problem. It thus seemed as a good idea to start the study with an examination and comparison of the evolution of the regulatory framework and the different policy tools that were used by France and Canada to deal with genetically modified organisms. Chapter 3 introduces the subject and describes the early days of biotechnology development in France and Canada which had led to sustained efforts to support biotechnology research and development in the 1980s. From the late 1970s, both countries were eager to capture the promises of economic development and both countries worked to develop strategies for research and industrial development that would allow them to reap the benefits of this new technology. As the stakes were getting higher, the issue was progressively getting more political. In France, the range of issues that got to be included in these political deliberations was already wider than in Canada. In Canada, few considerations were given, at the time, to environmental, health, or ethical considerations.

Chapter 4 offers an historical-institutional comparison of the evolution of biotechnology laws and regulations in France and Canada between the early 1980s to the early 1990s, that is, well before the public controversy started in either of those countries. In the mid 1980s, parallel to the efforts made to support and encourage the development of biotechnologies, France and Canada started to reflect on ways to regulate this new technological field. This chapter shows that, although France and Canada started off with similar economic goals, they ended up adopting very different regulatory tools which most likely had a differential impact on discourse. Avoiding giving new biotechnologies

any specificity, Canada chose to regulate products of genetic engineering using existing laws and regulations. In contrast, France's GMO-specific regulations and special institutional arrangements to evaluate risks were acknowledging the special nature of the risks that the new genetic engineering represented. But because of the consultative paths they took, France and Canada also contributed to shape the discursive network. In Canada, it led to unquestionable domination of the issue of research and industrial development and mostly restricted the discursive network to the government, industry and biotechnology research triangle. In France, this triangle was broken earlier to include the parliament, environmental groups and social science.

Chapters 5 and 6 respectively give an account of the evolution of the regulatory context and framework in France and in Canada after the early 1990s. These chapters highlight how both countries, from this point, made very different choices as to the tools and approaches they would use to regulate and manage GMOs. Through a narrative of the evolution of the regulatory framework, these chapters contextualize decision-making and provide evidence of how governmental strategies managed both social and institutional risks. In France, it was in a context of raising environmental concerns and high institutional risks that the first market introduction of GMOs had to be managed. In order to regain public trust, France and the European Union (EU) were pressured to increase the transparency of the decision process, to strengthen the expert capacity, and to reassure the public that science was indeed independent from corporate interests. In so doing, the EU and France participated directly in a discourse that recognized the existence of risks and increased their visibility. In seeking more transparency, France also opened up the discursive space to an even wider variety of actors and influences that ultimately enriched the debate and provided for a more careful decision-making process.

In contrast, Canada chose to use existing legislation and to continue employing the same evaluating structures for GMOs as for traditional food products. With no new law to be examined and a legal definition that did not recognize GMOs having any specific novel traits, Parliament was, for the most part, kept out of the debate. The definition of biotechnology which included both old and new biotechnologies served as a justification for this approach which also contributed to keep the debate at a very technical level. New biotechnologies would continue to be mainly the business of the public administration and consultations would target technical issues, and never have to include main policy orientations. This strategy kept new and less informed players out of the debate for a long time and limited greatly the range of issues that got to be openly discussed, giving the government more leverage to manage institutional risks. The Canadian government provided no space for public discussion of risks; it even discouraged public debates and marginalized opponents. In so doing, it kept control of the debate and was in a position to downplay risks and avoid the rise of institutional risks.

These accounts of the evolution of the regulatory framework did not however give all the information about the degree and the nature of institutional risks that the Canadian government was facing; nor did it give all the information about the strategies used by this government to face social and institutional risks. Because, in Canada, a major part of the controversy was kept away from the public eye, a significant part of the government strategy to avoid and manage institutional risks could escape analysis if one was to limit its study to elements found in public discourse. In Canada, the controversy surrounding the assessment of recombinant bovine somatotropine (rBST) and over mandatory labelling were major events that had not been entirely exposed in the public sphere. These controversies needed to be closely examined to better understand how different actors came to influence decisions and neutralize institutional risks before the controversy had a chance to grow out of hand. Chapter 7 shows how, in dealing with rBST and labelling issues, the Canadian government was successful at avoiding any significant institutional scrutiny and thus succeeded to maintain initial orientations over biotechnology and GMOs. Risks were never discussed openly and the decision-process was carefully kept away from public scrutiny. In the cases of rBST and labelling, the Canadian government globally maintained the *status quo* by silencing and marginalizing opposing voices, by abundantly sending positive messages about the government's accomplishments and, when needed, by ordering symbolic measures to reassure the population. This chapter illustrates the Canadian government's ability to control discourse and neutralise opponents.

Because public consultations also contribute to discourse building, Chapter 8 compares the approaches used by France and Canada during two wide ranging public consultations that took place in 1998: the French citizens' conference and the consultations relative to the renewal of the national biotechnology strategy in Canada. The story around these events exposes two very different approaches to communication and show how differently the role of public opinion played out in the two countries. While, in France, direct confrontation of ideas was encouraged, in Canada, it was avoided as much as possible. If, in France, citizens had a say in the choice of topics that would be discussed, in Canada, discussion topics were imposed so to avoid confrontation as much as possible. In Canada, these consultations were used to secure the government's continuing influence over the discourse. In France, they were used to try to rally public opinion around more moderate grounds and policy outcomes.

Chapter 9 presents the evolution of the French and Canadian discursive networks from 1980 to 2002. This network approach to discourse analyses draws on the press reviews, the personal interviews and the historico-institutional analysis of discourse. It compares the influence of corporations, the scientific community, NGOs opposing GMOs, and the government on public discourse and decision-making. Discursive

networks in Canada and in France were quite different. Canada started off with strong collaboration between the corporations and the government. This partnership even extended to the elaboration and implementation of a communication and information strategy that promoted the benefits of biotechnology while downplaying risks. In France, the government was also accustomed to work with the industry but their collaboration was not as exclusive with industry alone.

In France, the issue was, from the beginning, open to other influences and included a more diverse set of considerations. In Canada, not only did the government, corporations and the scientific community involved in biotechnology development come together to promote and support the continuous development of biotechnologies, they also tended, for a long time, to limit the debate to economic issues. Opponents were, in the process, marginalized and isolated. They could not even forward their concerns through normal consultative channels. These steps by government set up significant obstacles for opponents of the technology to influence both decision-making and public opinion. In France, it was rather the life-science/agri-chemical corporations that ended up being isolated and marginalized.

In Canada, food distributors and processors stood behind life-science corporations and the government in their efforts to convince consumers to accept GMOs. In contrast, in France, food processors and distributors were quick to disassociate themselves from life-science corporations out of fear of another food safety scandal. In France, opponents' credibility was boosted by the openness of the government in favour of stricter regulations, as well as by precautionary measures undertaken by the food processing and distribution industries. Further, the French press, being attentive to the anti-GMO discourse after a series of health and food security scares, became a public forum for the expression of doubts and fears. Creating a link between GMOs and globalisation, opponents successfully attacked the credibility and legitimacy of national, European and international authorities and took advantage of earlier failures of government in the areas of health and food security to push the government into agreeing to increasingly stringent regulations. In Canada, opponents struggled to get the attention of the press and had to face a very pro-active, defensive and well-structured government/industry communication strategy that downplayed risks and promoted biotechnologies.

In summary, this dissertation has drawn upon a comparison of the evolution of the discourse surrounding biotechnology in France and Canada to provide significant insights into the role of risks in political change. Although it can be argued that environmental and health related risks of GMOs were similar in both countries, different political contexts and different institutional settings led the French and Canadian governments to adopt very different strategies to deal with the controversy. In so doing, these two

countries provided important contrasting evidence on how social constructs of risks could lead or not lead to political change.

This research suggests that the expression of social and institutional risks can lead to significant institutional and political changes if a reflexive process can take place around the expression of those very risks. But findings also show that governments do have some leverage when it comes to controlling the reflexive process and its outcome. Accordingly, some governments and some institutions are able to resist change more successfully than others. These different levels of institutional resilience also point to the importance of democratic institutions in limiting the type and range of strategies that a government can use to control discourse and manage institutional risks.

Finally, this study confirms the role of perceptions of risk in political change. To track down its expression in discourse proved useful to understand a process through which risks can bring about change in controversial times. It also confirmed the relevance of concepts of institutional risk and reflexivity as essential elements of this process. Further studies should test this methodological and conceptual approach by introducing more countries into the comparison, by applying the framework to other policy fields involving other technological hazards, or by applying it to other public policy fields involving economic, ethical, health or identity-based risk controversies.

CHAPTER TWO

Conceptual and Analytical Framework

Risk is omnipresent in political life. Some even argue that "risk to the twenty-first century is what globalisation was to the late twentieth century."[1] Risk management is central to many projects, usually when there is a possibility that something unpleasant will happen as a result of natural or human factors. It is of course those risks we are aware of and those we have the power to control and confine that can create political controversies and lead to questioning of existing institutions. Groups and perhaps even communities seem to emerge around the necessity to fight a possible harm. Governments participate in discourse building around the definition of a given risk. What is most remarkable is the multifaceted nature of the concept of risk.

Risk is used in an impressive variety of disciplines and environments, from business management to engineering, from medicine to social sciences.[2] According to Douglas, the idea of risk has become prominent in political debate and "has become the regular coinage of exchange on public policy."[3] The language of risk, she argues, serves a centralizing and standardizing role at the level of public debate. It can be a tool to reach consensus, to impose certain standards, or to homogenize certain practices. "The neutral vocabulary of risk is all we have for making a bridge between the known facts of existence and the construction of a moral community."[4] Risk has also become a way of thinking. It is now part of a vocabulary for moralizing and politicizing the dangers around us, to set blame and responsibility. Risk is now used to legitimate or discredit policies and the language of risk has been adopted outside the traditional risk assessing authorities. [5]

The centrality of risks in today's globalized world is also emphasised by students of the late modernity. In fact, analyses of the crisis of modernity and of the industrial

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[1] J. Quiggin, "Managing the risky Business of Life," Australian Financial Review, 13 June 2003, quoted in Darryl S. Jarvis, "The Expanding Universe of Risk," Contemporary Politics, 10, no. 3-4 (2004) : 305.

[2] Darryl S. Jarvis, 305.

[3] Mary Douglas, Risk and Blame. Essays in Cultural Theory, (New York: Routledge, 1992), x.

[4] Douglas, 26.

[5] Ibid., 26.

society are being articulated around this concept.[6] They argue that risk has been determinant for the evolution of industrial society but they also suggest that it is being determinant in the present evolution of our societies and that the way we are dealing with risk is structuring culture, society and politics.[7] Accordingly, they argue that the crisis of modernity is intimately linked to our conception of risks. Some even argue that the crisis of the welfare state is first and foremost a crisis of risk management.[8]

In these conceptions of late modernity, risk and political change are closely intertwined through the idea of reflexivity, a process of self-confrontation of a society with its own rules and institutions. For Beck, threats from technological progress produce "conflicts that cast doubt on the social bases of rationality – science, law, and democracy" and the "social power of threats" lies with the possibility to endanger institutions "that have produced and legitimized it" and the possibility to "trigger political reflexivity".[9] Because of the pre-eminence of risk in political life and in political discourse, it will be argued in this thesis that the various forms of risk found in the discourse could be key to studying political change; that reflexivity - a process of self-confrontation of a society with its own rules and institutions - is a process through which changes can emerge; and that both social and institutional risks are central elements of reflexivity.

The first section of this chapter gives an overview of the different approaches to the study of risk. From positivists to social-constructivists, risks are seen either as objective measures, evaluations, or as perceptions that are dependent on psychometric variables or on a socio-cultural context. It will be followed by a review of some of the late modernists' conception of risks and its role in the evolution of modern industrial societies. The second part of this chapter provides a description and explanation of the analytical framework that will be used in this study.

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[6] Scott Lash and Brian Wynne, foreword to Risk society, by Ulrich Beck (London : Sage Publications, 1992), 3.

[7] Jane Franklin, introduction to The Politics of Risk Society, ed. Jane Franklin (Malden, MA: Polity Press, 1998), 1.

[8] Anthony Giddens, "Risk Society: the Context of British Politics," in The Politics of Risk Society, ed. Jane Franklin (Malden, MA: Polity Press, 1998), 33.

[9] Ulrich Beck, Ecological Enlightenment, trans. Mark Ritter (New-Jersey: Humanity Press, 1995), 30-32.

2.1 Approaches to the study of risk

In a review article, Judith Bradbury identifies three approaches into which most risk studies can be classified.[10] These studies distinguish themselves by their conception of risk: some conceive risk as a physical attribute, some as a psychometric variable, and others as a social and cultural construct. But in all three approaches, the underlying research question has to do with finding ways to manage risk, not to understand how risks impact on today's' society.

Risk conceived as a physically given attribute is defined as the product of the probability and consequences of an adverse event. According to Bradbury, this reflects the influence of engineering and safety studies on the emergence of modern risk analysis. Within this approach, "[t]he management problem is structured in terms of economic and technical rationality and the communication problem is seen to be informing or educating the public about risk as defined by the technical experts."[11] Here, the only real and correct definition of risk comes from the experts. This first approach is the realm of measure and evaluation, where risks are seen as objective and are defined scientifically.[12] This approach is beautifully summarized by Jarvis: "risk is an outcome-driven analytical tool, providing researchers with measurable outcomes amenable to technocratic and professional application in both public and commercial settings."[13]

The second approach identified by Bradbury, the psychometric approach, is multidimensional. It is interested in risk perception, communication and underlying reasons for disagreement between lay people and experts. Here too, Bradbury argues, the assumption is that real risks exist and are defined by experts. But the efforts are geared toward understanding why the public accepts or rejects a given risk. Is it because a risk is new or ancient, voluntary or involuntary, technological or natural? Is it because of the type and intensity of media coverage or of the nature of consequences (irreversible or not, catastrophic, concentrated or diffuse)? The management simply needs a clarification of what is perceived in the population and of the reason underlying this perception in order

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[10] Judith A. Bradbury, "The Policy Implications of Differing Concepts of Risk," Science, Technology, & Human Values vol. 14, no.4, (1989).

[11] Bradbury, 385.

[12] Lash and Wynne summarise this approach in the following terms: « Risk are defined as the probabilities of physical harm due to given technological or other processes. Hence technical experts are given pole position to define agendas and impose bounding premises *a priori* on risk discourse », 4.

[13] Darryl S. Jarvis, 305.

to formulate solutions, whether political, semantic, educational or scientific. She adds that this research contributes to viewing social science knowledge in instrumental terms. "The need to involve people with different perspectives in making societal decisions is not elaborated." [14]

> *"The management approach in effect permits the technical manager to pursue the technical aspects of technology development in isolation from its social implications. (...) The participation of, and communication with, other affected groups become a separate activity, an adjunct rather than an integral part of management decision making."*[15]

In this approach, as well as in the "risk as physically given attribute" approach, it is believed that objective facts can be explained, predicted and controlled by science, and that these objective facts can be separated from subjective values.

The third approach described by Bradbury conceives of risk and technology as social processes. Here it is recognized that risk is assessed and managed within a set of institutions and that the social and cultural context plays a role in risk perception and attitudes, and the formation of ideas about risk. "From this view point, acceptance and acceptability of risk cannot be analytically determined but must be negotiated, that is, socially constructed." With this approach to the study of risk, the key questions according to Bradbury are now related to the comparison of the competing claims and decision-making concerning the control of risk and technology when a diversity of values is expressed. Contrary to other approaches, risk, it is believed, does not exist independently of the humans who assess and experience its effects. Risk identification and risk estimation can never be value-free. Yet, according to Lash and Wynne, this other dimension of risks studies has also become instrumental as the problem is being reduced to "how institutions can adapt procedures and self-presentation in order to secure or repair credibility, without fundamentally questioning the forms of power or social control involved."[16] This observation opens another avenue to risk research: the role of institutions in changing risk perception and acceptability.

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[14] Bradbury, 386.

[15] Ibid., 388.

[16] "Yet the treatment of this novel dimension has been itself revealing, as the fuller depth of the problem has been reduced and coopted into the prevailing instrumental terms, as to how institutions can adapt procedures and self-presentation in order to secure or repair credibility, without fundamentally questioning the forms of power or social control involved." Lash and Wynne, 4.

In most of the studies referred to in Bradbury's classification, risk is a dependent variable, something to be managed, assessed, understood. These studies aim to answer questions such as: What makes for better risk management, assessment, characterization? What level of risk is acceptable? What factors affect risk perception? What makes a risk acceptable for the population? How does one reconcile conflicting views about risks? How to change public risk perception? How does one take decisions about risk when experts and the public have different views on what is an acceptable risk? In sum, these studies aim to understand and improve risk management and to facilitate decision-making. They never reflect on how risk has changed societies, institutions or politics.

Another category of studies brings a different perspective to thinking about risks issues. They reflect directly or indirectly on the changing nature of risk and on the role this concept has had on the evolution of society, institutions and politics. These studies raise a different type of questioning: what is the political impact of different views between lay people and experts? What is the impact of growing uncertainty on the legitimacy of institutions responsible for protecting the population? How is the changing nature of risk impacting on actors' configurations? How could conflicts about risks have an impact on institutional, political and societal change? How do risks management and strategies come to impact on institutions?

2.1.1 Risk as a part of the evolution of post-modern industrial societies

The following section examines the contribution of Ulrich Beck, Anthony Giddens, Peter Drucker, Brian Wynne and Henry Rothstein in order to arrive at a better understanding of the notion of risk and its implication for changes in society. They contribute to a reflection on the possibility that a combination of societal changes and of changes in the nature of risk could give this notion a new political and social significance. Changes in the nature and scope of risks as well as individualisation and detraditionalisation are suggested conditions that could make risk a central notion to understand political processes.

2.1.1.1 Beck's Risk Society

Beck's interpretation of the importance of risks in today's society is based on François Ewald's analysis of the changes brought about by industrialization. Based on a study of social rights in France, Ewald suggests that the conception of risk in early industrial societies was central to its development and to the preservation of social peace. The use of machines had forced a rethinking of the notion of security, and accidents came to be seen as the product of normal activities, as a downside of the production of social goods. According to this interpretation, the problem was then to decide how to distribute the charges emerging from the production of these goods. The notion of risk served this purpose and the technology of insurance helped find ways to organise this reality and to achieve a form of social justice. The solution to the new social problems emerging from the security threats of early industrialisation, it seemed, came with their construction in terms of risks. This concept constituted a modern way to relate to one another, to evaluate morality of conducts based on 'objective' criteria. Because it allowed societal authorities to address social dilemmas in an apparently objective and neutral manner, the notion of risk was increasingly relied upon to understand and conceptualize the world.[17]

But this construction of reality in terms of risk does not a have a limit as risk is a social construct that can be applied to any situation. The social contract, which depended on the very use of the concept, argues Beck, is now threatened by the changing nature of risks. Nuclear power, chemical or biotechnological productions create "mega-technological hazards" that subvert or suspend "the foundations of the established risk logic"[18]: "Unlike the risks of early industrial society, contemporary nuclear, chemical, ecological, and biological threats are (1) not limitable in scope, either socially or temporally; (2) not accountable according to the prevailing rules of causality, guilt or liability; and (3) neither compensable nor insurable."[19]

According to Beck, new risks are not only environmental problems, but also they can become an institutional crisis. These "new" risks violate the social security pact and

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[17] François Ewald, L'État Providence, (Paris, Grasset, 1996).

[18] Ulrich Beck, "From Industrial Society to the Risk Society: Questions of Survival, Social Structure and the Ecological Enlightenment," trans. Mark Ritter, Theory, Culture & Society 9 (1992), 101.

[19] Ulrich Beck, Ecological Enlightenment. Essays on the Politics of the Risk Society, trans. Mark Ritter, (New Jersey: Humanities Press, 1995), 2.

question the social consensus in favour of progress. [20] They force a rethinking of the rationale upon which society is based. Beck identifies five ways in which new risks have the potential to disturb the social and political dynamic. [21]

1. "New" risks differ from wealth, and pose a different distributional challenge. "One can possess wealth but one can only be afflicted by risks." Consciousness about risk is thus critical and "knowledge gains a new political significance."
2. Risks are often invisible, and based on a causal interpretation. They exist in terms of knowledge about them. Risks are thus subject to social definition and construction through which they can be minimized or magnified. Those who define risk – media, scientific experts or legal experts - thus occupy key political positions in this new political dynamic.
3. New risks affect everyone. They transcend class and national boundaries and thus question the relevance of existing frontiers. People are no longer united by their social or economic class, but by their positioning in terms of social risk. In a similar way, the evidence of new risk-produced international inequalities is replacing the notion of nationality and these risk-related inequalities have the potential to undermine the legitimacy of national jurisdictions.
4. Risk societies are "bottomless barrels of demand." The economic exploitation of risk is independent of satisfaction of human needs such as hunger. Risk is everywhere; security is always relative and can always be perfected. Furthermore, commercial interests are there to stimulate the demand for more security.
5. Socially recognized risks contain political explosives. They can provide a justification to intervene in the private sphere. The identification of risk can have important social, political, and economic consequences beyond the normal side effects on health and environment (side-effects of the side-effects). Furthermore, politics is now forced to take permanent actions in reaction to catastrophes or fear of catastrophes. With catastrophes, "exceptional conditions threaten to become the norm."

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[20] Beck, "From Industrial Society to the Risk Society", 98-100. The changes in the nature of risks are also well summarized by Scott Lash and Bryan Wynne in their introduction to Beck's *Risk Society*. "For Beck the consequences of scientific and industrial development are a set of risks and hazards, the likes of which we have never previously faced. These dangers can, for example, no longer be limited in time – as future generations are affected. Their spatial consequences are equally not amenable to limitation – as they cross national boundaries. Unlike in an earlier modernity, no one can be held accountable for the hazards of the 'risk society'. Further, it is becoming impossible to compensate those whose lives have been touched by those hazards, as their very calculability becomes problematized."

[21] Beck, Risk Society, 22-24.

According to Beck, in addition to the changes in the scope and magnitude of risks, two processes, the *end of nature* and the *end of tradition*, characterize late modernity and create conditions in which risk has the potential to become an important political variable. 1) In late industrial societies, risks no longer emerge mainly from nature. Most dangers are now directly or indirectly related to human activities. Risks are now for the most part "manufactured", as they are mainly consequences of human decisions. In Beck's view, they emerge from "decisions that focus on techno-economic advantages and opportunities and accept hazards as simply the dark side of progress."[22] With the end of nature, the focus of our anxieties is no longer what nature can do to us but what we have done to nature. 2) The end of tradition is, according to Beck, a detraditionalization of the ways of living. "Traditional forms of coping with anxieties and insecurities in social-moral milieus (…) are falling." In modernity, scientific rationality replaces tradition. When this rationality is contested, as, for example is the case of risk related to genetically modified food, society is left with no reliable guiding principles for decision-making. In the absence of guiding principles, "coping with anxiety and insecurity is demanded of the individuals themselves." [23] This creates a situation where risks affect individuals in a very intimate way as risks become part of decisions about day to day life. Detraditionalization leads to a form of individualization, a form of disintegration of the certainties of industrial society combined with the urge to find new ones.[24] This vacuum creates conditions favourable for new conceptions of risk to impact on society and politics as people are looking for alternative ways to justify decisions. It thus opens the door for a rethinking of decision-making processes and standards.

Beck argues that with the end of nature and the end of tradition comes the *risk society*. This concept designates "a developmental phase of modern society in which social, political, economic and individual risks increasingly tend to escape the institutions for monitoring and protection in industrial society."[25] In risk society, internal or manufactured risks are "generated by the processes of modernization which try to control them."[26] It is "an epoch in which the dark sides of progress increasingly come to

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[22] Beck, "From Industrial Society...," 98.

[23] Beck, Risk Society, 153.

[24] Ulrich Beck, "The Reinvention of Politics: Towards a Theory of Reflexive Modernization,» In Reflexive Modernization. Politics, Tradition, and Aesthetics in the Modern Social Order, eds U. Beck, A. Giddens and S. Lash (Stanford: Stanford University Press, 1994), 14.

[25] Beck, "The Reinvention of Politics," 5.

[26] Ulrich Beck, "The Politics of Risk Society," In The Politics of Risk Society, ed. Jane Franklin (Malden, MA: Polity Press, 1998)

dominate social debate."[27] In sum, the obsolescence of industrial society leads to the risk society. This transition to the risk society, he suggests, is accomplished through a *reflexivity* process, which results from an unplanned and unexpected process of self-confrontation of industrial society with its own standards. Beck suggests there are two transition phases:[28]

1. The first stage is characterized by the self-confrontation of industrial society with its own rules and institutions. In this stage, society is confronted with its own paradox. It is "…a stage in which the effects and self-threats are systematically produced but do not become public issues or the centre of political conflicts. Here the self-concept of industrial society still predominates, both multiplying and 'legitimating' the threats produced by decision-making as 'residual risks'."

2. In the second phase, the dangers of the risk society begin to dominate public, political and private debates and conflicts thus creating a favourable climate for reflection. At this stage "certain features of industrial society become *socially* and *politically* problematic."[29] "On the one hand, society still makes decisions and takes actions according to the pattern of the old industrial society, but, on the other, the interest organizations, the judicial system and politics are clouded over by debates and conflicts that stem from the dynamism of risk society."[30] In this second stage, the paradox of late industrial societies can become the object of a social or political reflection.

2.1.1.2 Anthony Giddens and the "End of Modernity"

Giddens also believes that significant changes in the nature of risk (in their scope and magnitude) have occurred but he considers that the resurgence of risk as a politically relevant variable is mostly a consequence of modernity**.** He believes, as Beck does, that the end of nature and the end of tradition create conditions favourable for change, but he also believes that the notion of *trust* plays a central part in contemporary social and political transformations.

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[27] Ulrich Beck, Ecological Enlightenment, 2.
[28] Beck, "The Reinvention of politics," 5.
[29] Ibid., 5.
[30] Ibid., 5.

Giddens distinguishes risk from hazards or danger. According to him, risk consists in the active assessment of future hazards. "The idea of risk is bound up with the aspiration to control and particularly with the idea of controlling the future." [31] He points out that risk society is not necessarily more hazardous than classical industrial society, rather "it is a society increasingly preoccupied with the future, which generates the notion of risk."[32] He shares with Beck the belief that with modernity come the end of nature and the end of tradition. In his view, it is however mainly by their impact on *trust* in expert institutions that these processes generate risk.

For Giddens, modernity is characterized by the disembedding of social systems: social relations are "freed" of their local context and can be restructured across time and space.[33] He identifies two types of disembedding mechanisms, which are intrinsically involved in the development of modern social institutions: the creation of *symbolic tokens* and the establishment of *expert systems*. Both of these mechanisms depend on trust in abstract systems and organisations. In the case of technology, this trust is a form of faith in expert institutions, possibly because of the belief that objective knowledge is possible to achieve; that what is true now will be true later; and that knowledge is universal. With the creation of expert systems, "[t]he routinisation of daily life has no intrinsic connections with the past at all, save in so far as what 'was done before' happens to coincide with what can be defended in a principled way in the light of incoming knowledge."[34]

Events in the last 30 years have eroded trust in expert institutions, and the false assumption of knowledge certainty has led to disillusionment. As experience shows that all knowledge can be revised, it becomes more and more difficult to trust expert systems. "Widespread lay knowledge of modern risk environments leads to awareness of the limits of expertise and forms one of the "public relations" problems that have to be faced by those who seek to sustain lay trust in expert systems."[35] Giddens believes that this decrease in trust is leading to a multiplication of risk as a social and political issue. In other words, risks take a special importance because there are no ultimate, unquestionable answers to most of them.

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[31] Anthony Giddens, Conversations with Anthony Giddens. Making Sense of Modernity. (Stanford: Stanford University Press, 1998), 101; and Giddens, "Risk Society: The Context of British Politics," 27.

[32] Giddens, "Risk Society: The Context of British Politics," 27

[33] Anthony Giddens, The Consequences of Modernity, (Stanford: Stanford University Press, 1990), 21.

[34] Giddens, The Consequences of Modernity, 38.

[35] Ibid.,131.

Giddens also believes that risks lead to social and political changes because individuals are now confronted by them in a more personal manner than before. The notion of risk was part of the dynamic of early industrial societies, but at that time, risks were *external* to individual decision-making because they were taken in charge by the welfare state or private insurance. Risks are now more and more internal to individual decision-making. This is a consequence of what he calls "the reflexivity of modern social life", which consists in the constant re-examining of social practices in the light of incoming information about those very practices. In Giddens' view, the domain of reflexivity in modern society is mostly expert knowledge, which is characterized by a circularity of knowledge, a constant revision of knowledge-claims. With the advent of modernity, tradition still plays a role but not a significant one: tradition is itself justified in the light of knowledge while knowledge does not have to be confirmed by tradition.[36] Uncertainties, he argues, are now mainly created by the very growth of human knowledge.[37] In such a context, individuals are left to decide for themselves which interpretation of reality is the right one.

2.1.1.3 Drucker's Knowledge Society

Drucker's interpretation of the changes in the nature of risks is based on an interpretation of the evolution of societies that presents similarities with Giddens' view.[38] According to Drucker, new social bases emerge from a new consciousness of uncertainty. Society, according to him, has gone from one looking for salvation and security in religious faith, to a society that turns to the State for its security (welfare state). But the principles of the welfare state, according to Drucker, are less and less viewed as guides for action.

> *« Nous avons progressivement découvert "qu'il existe sans doute jamais une seule et bonne solution à un problème de société…nous savons désormais que*

[36] Ibid., 38.

[37] Anthony Giddens, "Risk, Trust, Reflexivity," In Reflexive Modernization. Politics, Tradition, and Aesthetics in the Modern Social Order, eds U. Beck, A. Giddens and S. Lash (Stanford: Stanford University Press, 1994), 184-185.

[38] Peter Drucker, Les nouvelles réalités. De l'État providence à la société du savoir, trans. (Paris: Interéditions, 1989).

> *les problèmes, les données, les comportements sociaux sont bien trop complexes pour admettre une unique bonne solution. À supposer qu'on y puisse quelque chose, il y aura toujours plusieurs solutions valables, et aucune parfaite. (...) Malheureusement la promesse du salut par la société ne rencontre d'écho populaire que si l'on ose proclamer "voilà la solution" ou au moins, "voilà la meilleure solution". »* [39]

The multiplication of contradictory opinions (scientific or not) makes the decision-making task more and more difficult and problematic for state agencies and makes every decision vulnerable to contestation. At the same time, unquestionable answers and solutions are still expected and hoped for by the population. Because decisions are more and more based on knowledge and less on the guiding principles of the welfare state, Drucker argues that we are now living in a *knowledge based society*, characterized by a new and increased consciousness of the uncertainty and complexity of decisions, and by the absence of guiding principles. This passage from a welfare state to a knowledge society, he argues, triggers the reorganisation of interest groups along different lines. It creates a new kind a pluralism in which new groups have a different social and political responsibility, and in which the role and function of the State is questioned.

2.1.1.4 Coicaud's "Autoréflexion"

Coicaud, in *Légitimité et politique*, believes, somewhat like Giddens and Drucker, that a « dynamique d'autoreflexion » is at work in knowledge societies.[40] But he also believes that this dynamic questions the very principles on which it is based. In a way, modernity did not completely break away from pre-modernity. « Il existe une nostalgie d'un environnement sûr, peu sujet à révision et à contestation en comparaison d'un monde moderne dont l'ambition déclaré est de dissoudre le vaste panorama des évidences

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[39] Drucker, 28.

[40] Jean-Marc Coicaud, Légitimité et politique. Contribution à l'étude du droit et de la responsabilité politiques (Paris : Presses universitaires de France, 1997), 228. « Un mouvement de connaissance qui recherche l'émancipation des individus par un accroissement permanent de la compréhension de leur environnement. »

hérités des préjugés sédimentés et des certitudes institutionnalisées. »[41] Science is especially exposed to this nostalgia as it became the mainspring of knowledge organisation and replaced religion and tradition in the quest for certainties that would relieve the uneasiness of a changing world. Science occupies a difficult, uneasy position, between the constant revision of knowledge and the need for stability and benchmarks. Coicaud believes that science is the victim of a pre-modern idea that is still prevalent today, even within the scientific community, namely that of the existence of an absolute, objective and immutable truth. In a way, he argues, science is discrediting itself through its own progress[42].

2.1.1.5 Brian Wynne and the expert- lay knowledge divide

For Brian Wynne, that risks have changed in nature are irrelevant to the discussion. He thinks that the public's reaction toward expert institutions is not a function of the way real risks are treated by these institutions. The public reaction would be the same if these risks did not exist. According to him, the real risk is social-relational. Public risk perception does not relate to an existing objective physical risk. "[P]ublic perceptions of and responses to risks are rationally based in judgements of the behaviour and trustworthiness of expert institutions, namely those that are supposed to control risky processes..."[43]

Wynne describes a cultural process by which dependence and the absence of control over technological innovation are rationalised by the population inside social constructs that he calls *spectres*. These spectres are "a defence mechanism for coping with overwhelming difficulty of living with inexplicable and uncontrollable, yet emotionally important forces." In a way, 'spectres' are the conversion of risks into "identifiable agents even superhuman ones." These are condensed forms of understanding that short circuit the emotionally impossible complexity of experiences of powerful but obscure forces such as those of modern technologies.[44]

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[41] Coicaud, 230.

[42] Ibid., 228-233.

[43] Brian Wynne, "May the Sheep Safely Graze? A Reflexive View on the Expert- Lay Knowledge Divide." in Risk, Environment and Modernity: Towards a New Ecology ed. S. Lash, B. Szerszynski and B.Wynne (London: Sage, 1996), 57.

[44] Wynne, "May the Sheep," 54.

He thinks that Giddens makes a mistake in suggesting that science tends to impose empty models and that reflexivity is based on a confrontation of morally equivalent interpretations of reality. Rather, Wynne believes that science is far from neutral. "[S]cientific expert knowledge itself embodies a particular culture – that is, it disseminates and imposes particular and problematic normative versions of the human and the social…"[45] He adds that the process of innovation is now extremely socially alienated. This, he argues, has important consequences when a given technology relies on an extensive social basis for its existence, as is the case of innovations that concern food. "The technology may require for its viability conditions which simply do not exist, such as particular cultural attitudes to interpersonal relationships, or particular skills or resources."[46] The social insulation of innovators increases the feeling of insecurity of the population, especially if the innovation is imposed and creates irreversible conditions. Contrary to Giddens, Wynne suggests that the public was always sceptical of science and that this very scepticism triggered the emergence of competing scientific information. Uncontested science does not mean that the public trusted science.[47] He does not agree with Giddens that the confrontation of different scientific viewpoints is responsible for the perception of risk or the multiplication of risk. He believes that the real risk is the one perceived by the population when institutions lose their credibility. It happens, for example, when the population considers it depends on institutions it feels are not as independent as they should be from private interests. According to Wynne, the risk perceived by the population is a function of the perceived trustworthiness of expert institutions, of the perceived acceptability of the decision-process and of the perceived compatibility of the proposed changes with local values and identity. These, according to Wynne, are the basis of reflexivity.

2.1.1.6 Institutional Risks and Risk Colonization

Rothstein and collaborators reflected on the increasing role of risk as a key concept in regulatory regimes. They argued that risks can be divided into two categories that I find to be very useful: societal risk and institutional risks. In their model, societal

[45] Wynne, "May the Sheep," 75.

[46] Brian Wynne, "Redefining the Issues of Risk and Public Acceptance. The Social Viability of Technology," Futures 15, no.1 (1983): 13-32.

[47] Wynne, "May the Sheep."

risks are defined as threats to members of society and to their environment; for example, risks to health, the environmental or financial risks. And institutional risks are described as "risks to organizations (state or non-state) regulating and managing societal risks, and/or risks to the legitimacy of their associated rules and methods."[48] These latter risks take the form of legal and reputational risks and they arise when blame and liability are directed to and create threats to institutions involved in risks management. In sum, Rothstein suggests that, in attempting to manage risks to society, threats to organizations managing those risks are being created.[49]

The core argument is that risk as a concept is increasingly defining "the object, methods and rationale for governance", a phenomenon they call "risk colonization".[50] In their view, the "growing centrality of risk to regulation in the post-war years" was not only due to an increasing demand for regulation of a widening range of societal risks. They argue that regulatory institutions also found in risk a very attractive tool to manage both social and institutional risks. Because regulators have only a limited capacity to control societal risks, they needed a concept that could be instrumental to justify decisions, explain results and even render some degree of failure acceptable. Risk does just this, in transforming decision-making into "a probabilistic assessment of success and failure."[51] Furthermore, in a context of system failure, risk can become a tool of "system maintenance", "an instrument for reflexively managing the associated institutional threats."[52]

For Rothstein and collaborators, in the process of risk colonization, the difficulty of managing societal risks creates threats to institutions managing those very risks and the incentive to use risk management tools to manage institutional risks. On the positive side, at a first stage of risk colonization, the use of risk as a managing tool could improve decision-making and add transparency and legitimacy to the process. Furthermore, the pressure felt by risk managing institutions through institutional risks can encourage these towards more transparent and perhaps more careful regulations. But increased scrutiny and control coupled with demands for more transparency and accountability have also

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[48] Henry Rothstein, Michael Huber and George Gaskell, "A Theory of Risk Colonization: the Spiralling Regulatory Logics of Societal and Institutional Risk," Economy and Society 35, no.1(2006), 91-112, 92.

[49] Henry Rothstein, « The Institutional Origins of Risk : A New Agenda for Risk Research, » Health, Risk & Society 8, no.3 (September 2006), 215.

[50] Rothstein, « The Institutional Origins of Risk," 215.

[51] Rothstein, Huber and Gaskell. "A Theory of Risk Colonization," 99.

[52] Rothstein, Huber and Gaskell, 91 and 106.

served to amplify risk colonization by exposing the limits and failures of regulatory institutions.

> *"As regulation becomes subject to greater scrutiny by, for example, the executive, judiciary, organized interests, or the public, then it might be expected that organizational behaviours and failures are turned into potential liabilities. Regulators, therefore, need to find a way of accounting for, and justifying, performance in order to minimize institutional risks."*[53]

At a second stage, Rothstein suggests that the very management of institutional risks can have adverse impacts on the management of societal risks if pressures are created to prioritize the management of institutional risks. If there is a "misalignment" between the management of societal and institutional risks, institutional risk can become an object of management in its own right. This could induce blame-avoidance behaviours on the part of regulators; or modify a regulator's perception of societal risks. In this latter case, it is hypothesised that a high level of institutional risks would shift attention to those societal risks that create the most threats to institutions.[54] Questionable institutional risks management strategies could include expensive risk communication strategies/propaganda to persuade audiences of the legitimacy of a decision or of a decision-making process; symbolic actions of the sort of fake consultative commissions; or public debate that have as a main goal to calm down public opinion while increasing the legitimacy of decision-making.

2.1.2 Reflexivity, Risks and Political Change

Reflexivity, a society's process of confrontation with its own rules, is central to the study of risks and its political significance because it introduces a dynamic of change between risks and society in general, risks and institutions and risks and decision-making.

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[53] Rothstein, Huber and Gaskell, 100.

[54] Rothstein, Huber and Gaskell, 104; and Henry Rothstein, "The Institutional Origins of Risk," 218.

In sum, it suggests a mode of interaction in which risk is a key concept through which change can be studied.

Beck, Giddens, Coicaud, Drucker, Wynne, Rothstein and even students of the role of ideas and of cultural theory agree that a process of self-confrontation is at work that can bring change. They have however different opinions about the nature of the confrontation. In all cases, trust, or the lack of it, is a central element to the process of reflexivity. Its erosion brings about questioning and change.

For Beck, reflexivity comes through the accumulation of paradoxes and the confrontation which is made at all levels as the consequences of previous decisions lead to questions about existing institutions. It is a "confrontation of the bases of modernization with the consequences of modernization."[55] For Giddens, as well as for Drucker and Coicaud, it is the revision of knowledge that questions the authority and credibility of established institutions. Giddens is of the opinion that the confrontation is made between expert knowledge and expert institutions but Wynne believes that the confrontation is between lay-knowledge and expert institutions. Giddens believes that expert knowledge and trust are at the centre of the reflexivity process. For Wynne, trust in expert institutions is linked to the perceived independence and credibility of expert institutions, not to a constant revision of knowledge.

Coicaud and Drucker consider that trust seems to erode as a consequence of contradictions between deep-rooted values and reality. The realities of the knowledge society are colliding, in Drucker's view, with the aspirations and values of the welfare state. And their contradictions characterize today's industrial and modern societies. For Coicaud, the clash that induces "autoreflexion" is between the nostalgia for an objective science and the reality of knowledge revision.

Reflexivity is not a central theme in Rothstein's model of risks colonization but his model also suggests a process of self-confrontation, mostly at the regulatory level, of society with its own institutions through institutional risks. When, as a consequence of their management of social risks, regulatory institutions reflect and react to threats to their own existence, role, legitimacy and practices, the "risk of risk management" can come to modulate decision-making itself. In their model, risk is a tool for system management. It is also a new category of risks: institutional risks. Their model is interesting because it describes a process through which institutions are affected and through which change can

[55] Ulrich Beck, "The Reinvention of Politics: Towards a theory of Reflexive Modernization." In Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order eds Beck, Giddens and Lash (Stanford: Stanford University Press, 1994), 6.

be induced. They do not however suggest a way to study empirically this new category of risks.

The idea of reflexivity, although not always referred to in such a way, can also be found in other scholar's conceptions of political changes. Students of the role of ideas and cultural theorists have contributed to this reflection, mostly in relation to the notion of social, cultural and political change. Some authors have suggested that a certain form of self-confrontation could be at play in political changes as visions of the world are eventually confronted with a reality that proves it wrong. The cultural theory states that a way of life not only guides preferences, it also tells individuals and groups what to expect from life. If life tells them wrong, if they are surprised by life, they might switch from one cultural bias to another. "People change their ways of life whenever successive events (that is, surprises) intervene in such a way as to prevent the preferred pattern of relationships from delivering on the expectations it has generated."[56] *Surprises*, according to this theory, are "cumulative mismatches between expectation and result."[57] An event is never surprising in itself. It is potentially surprising only in relation to a particular set of convictions about how the world is and it is surprising only if the holder of that particular set of convictions notices it.[58] In turn, Swidler believes that, in settled times, culture provides a guide for action in limiting the available range of strategies of action. But in *unsettled times*, culture becomes more articulated and explicit. There is a search for new patterns of action for situations that do not find an answer in the existing range of action. As culture is opened up and becomes more explicit, structural and historical opportunities will, in turn, determine which strategy, and thus which cultural systems will succeed.[59] Finally, students of the role of ideas also contributed to this reflection. For Hall and for Sabatier, a switch from one set of ideas to another can be explained by a change in the power relations among actors; by *external shocks* that will bring the population to question the authority in place; or by an accumulation of incoherence or failures related to previous decisions. They argue that important shocks --

[56] Michael Thompson, Richard Ellis and Aaron Wildavsky, Cultural Theory (Westview Press: Boulder, 1990), 75.

[57] Thompson, Ellis and Wildavsky, Cultural Theory, 80.

[58] Ibid., 70.

[59] Ann Swidler, "Culture in Action: Symbols and Strategies," American Sociological Review 51(1986), 284.

the realization that what we are getting is not what we bargained for-- can lead to significant changes.[60]

Shedding light on the role of contradictions between values and reality, or between promises and realizations, these theories are related to the models developed by students of the role of risk. Whether they call it external shock, surprises or unsettled times, they all refer in the end to risks to society that could end up being translated into institutional risks. They all suggest an erosion of trust or at least a questioning of prevalent values or structures that can open a window of opportunity for changes in culture, society, institutions, or even within the power relations among actors. All these theories bring us back to a few central ideas: there are mechanisms that can force institutions to act or react; and there are mechanisms or circumstances that can threaten their existence or integrity. Reflexivity, which can be compared to a feed-back mechanism, sheds light on the dynamic of change and is well worth studying. Finally, risk, because of its centrality, can be used as a key concept to study these mechanisms.

2.2 Theoretical and Methodological Approach

The goal of this thesis is to advance the understanding of the political role of risk. The literature explored so far has served to establish the basis of a model of interaction between risk, institutions and decision-making. But the concepts need to be defined and operationalized. In the following pages, I propose a conceptual framework for the empirical study of the role of risk.

Studying and comparing chronologically the regulation of biotechnology in Canada and France, I am hoping to develop and test an analytical model that will serve this purpose. In so doing, I first describe the nature and occurrence of risks (both social and institutional) as expressed in the discourse. I then try to better understand, given the "pattern of risks" within each cases, the degree to which each of these countries showed resilience to change in their decision-making patterns and how this led, or not, to political and/or institutional changes.

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[60] Peter A. Hall, Policy Paradigms, Social Learning, and the State, » Comparative politics, April 1993, 275-296. Paul Sabatier, Policy Change and learning: An Advocacy Coalition Approach. (Westview Press: Boulder, Co, 1993).

The approach used to study risk through discourse will be explained in the following section. Adopting the discourse theory stance to discourse analysis, I briefly define discourse as linguistic and non-linguistic signs forming different images and definitions of reality that are propagated by actors and institutions. In this approach, concepts of antagonism, equivalence and hegemony provide an interesting canvass to conceptualize political and institutional change and/or stability. Here, the prevailing system of difference is key to the emergence of antagonistic identities or hegemonic discourses.

To order the different variables, limit the study and help reach an explanation, I suggest, a typology of institutional and political risks and a model that can help understand the relationship between discourses about risks, the raising of these institutional risks and, eventually, change. Risks are studied through discourse within the political community and the media. To be considered significant, risks have to be expressed within the political arena, in public forums or in media of general interest. In my framework, it is hypothesized that institutional risks are expressed through public judgments of the methods, the capacity and the intentions of organizations managing risks.

2.2.1 Studying risks through discourse

My approach to discourse analysis is taken from discourse theory. This theory is interesting because it explores the political aspect of discourse and suggests ways in which discourse, as a process of meaning formation, can come to impact on political life. From this theory, a number of models to study and explain political change can be deduced and will be briefly described at the end of this section.

In this research, I adopt the idea that discourse is composed of linguistic and non-linguistic signs. Actions and behaviours are also components of discourses. In that, I agree with Sayyid and Zac, for whom discourse is "more than verbal or written speech", "it includes actions, thoughts and beliefs"[61]. This definition of discourse is also supported

[61] Bobby Sayyid and Lilian Zac, "Political Analysis in a World without Foundations," in Research Strategies in the Social Sciences. A Guide to New Approaches, ed. E. Scarbrough and E Tanenbaum (Oxford: Oxford University Press, 1998), 257.

by Laclau's opinion that discourse is not only spoken or written, it is also the connection between words and associated actions[62]; and with Laclau and Mouffe, as cited in Howarth, "that all objects are constituted as objects of discourse" and that there are no difference in essence between "the linguistic and behavioural aspects of a social practice." [63] Discourse theory does not however deny the existence of material entities. Language, it is argued, does not create entities. Reality, because conceived as a social construction, is believed to be accessible only through the descriptions made in discourse. World descriptions, in turn, have an important effect on how we understand reality. [64]

According to discourse theory, discourses are systems of signs which express ideas, values, or beliefs. These signs, whether spoken or written, linguistic or not, exist and take a meaning in relation to their context. What is ultimately signified is thus not necessarily what was originally meant. According to Howarth, "the sign is overflowed by a plurality of significations, which cannot be finally stabilized." [65] The process of describing the world does not stop with the enunciation of an idea of what the world is. The description continues to evolve through diverse interpretations and reformulations. Meaning is never final, never entirely fixed and it is precisely this evolutional and changing character that makes it politically relevant.

Relevant variables of social and political phenomena have to be discovered through an examination of discourse, that is, of the different images and definitions of reality that are propagated by actors and institutions. It is through the examination of the construction of objects and politics in discourse that an understanding of socio-political phenomena can be reached.[66] The examination of the diversity of these constructions and of their "relative permanence"[67], allows, in turn, for a better understanding of political changes. As Howarth expresses it: "In Laclau and Mouffe's view, all objects are

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[62] Ernesto Laclau, La guerre des identités. Grammaire de l'émancipation, trans. Claude Orsoni (Paris: La Découverte/M.A.S.S., 2000), 10.

[63] Ernesto Laclau and Chantal Mouffe, Hegemony and Socialist Strategy: Towards a Radical Democratic Politics (London: Verso, 1985), 10, quoted in David Howarth, "Discourse Theory and Political Analysis" in Research Strategies in the Social Sciences. A Guide to New Approaches, ed. E. Scarbrough and E Tanenbaum (Oxford: Oxford University Press, 1998), 274.

[64] Sayyid and Zac, "Political Analysis in a World without Foundations," 255.

[65] David Howarth, "Discourse Theory and Political Analysis" in Research Strategies in the Social Sciences A Guide to New Approaches, ed. E. Scarbrough and E Tanenbaum (Oxford: Oxford University Press, 1998), 273.

[66] Howarth, 250.

[67] « Political analysis becomes a question of examining the unevenness, and the relative permanence, of certain ensembles of meaning. » Howarth, 250.

discursively constituted by articulatory practices such that the determinants and limits of discursive formations are not an extra-discursive 'reality' but other discourses."[68] They believe that what is political lies in a zone of constant reorganization between meaning and identity, in the efforts that are made to rally subjects and structures to a vision, an idea, a definition, in sum, in the efforts made to unify the discourse.

"There are two sides to discourse, then. On the one hand, there is a relatively stable unity of meaning and identities; on the other, there is that gap which prevents full closure. It is the latter – the gap – which marks precisely the domain of the political: that arena in which contestation takes place with the aim of suturing, or closing, the gap. In all discursive formations, there will be various projects trying to close the gap, to master the political arena, to found a unified discourse by means of complex operations."[69]

Central to this approach to discourse analysis are the concepts of identity, meaning, antagonism and hegemony; together they provide a canvass for a better conceptualization of political and institutional change and/or stability. Identities, just like meanings, are believed to be produced by, rather than reflected in, language. It is through discourse that actors and communities define themselves. "Identity of a subject will be given by its insertion within a discourse" and, within a discourse, subjects will come to occupy "a certain position": "powerful, subordinated, central, marginalized..."[70] How identities come to be, how they evolve and change and how they come to be part of dominant, central, or marginalized discourses are thus important foci of discourse analysis. While meaning is the definition of an object, identity is the definition of oneself in relation to a given object (idea, structure, group or individual). It is a vision of who we are collectively, a definition of ourselves that can be apparent in the discourse. Identity formation, argues Howarth, also takes place when subjects are forced to take positions in relation to existing structures. Such is the case when subjects are asked to take decisions concerning certain projects, discourses or processes. [71]

Sayyid and Zac argue that identity is negative and relational. Subject identity is constructed by its relation to others.[72] Collective identities, it is believed, follow the same principle. And how a community conceives of itself in relation to other social systems, present, past or future, constitutes the limits of that community. On the one hand, it is

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[68] Ernesto Laclau and Chantal Mouffe, Hegemony and Socialist Strategy**,** (London: Verso, 1985), 146, quoted in David Howarth, 272.

[69]Sayyid and Zac, "Political Analysis in a World without Foundations," 260.

[70] Sayyid and Zac, 263.

[71] Howarth, 279.

[72] Sayyid and Zac, 263.

possible that the presence of another, different identity will work to stabilize the dominant one in a logic of "us vs. them". The very existence of a given identity is then justified against the presence of other, threatening identities. When the existence of another identity prevents one from being total, we are in the presence of antagonistic identities. Antagonisms are, according to Laclau what structures society, creating contexts by the exclusion of the radically different.[73]

> *"What are social antagonisms in Laclau and Mouffe's perspective? In opposition to traditional conceptions of social conflict in which antagonisms are represented as the clash between social agents with fully constituted identities, Laclau and Mouffe insist that social antagonisms occur because of the failure of social agents to attain their identity. Thus antagonism occurs when "the presence of [an] "Other" prevents me from being totally myself…This "blocage" of identity is a mutual experience for both the antagonizing force and the force being antagonized…"*[74]

Also central to Laclau and Mouffe's discursive approach is the concept of hegemony. This concept captures the essence of discursive strategies. "The success of any political project is measured by its ability to fix meaning, at least relatively, within a specific context. This is what discourse theorists call hegemony.[75]" Two elements are considered essential for the success of a hegemonic project: "A hegemonic project can be judged successful when it achieves two things. First, when it succeeds in making its proposed logics and rules the "natural" rules of the community. Secondly, it is successful insofar as it contributes to the deactivation, or "forgetting" of the other projects against which it was struggling."[76]

The hegemonic project aims to link together different identities into a common project.[77] It also aims to close the gap between structures and subjects (institutions and communities). "The more stable the hegemonic hold of a discourse, the less scope there is for a change in subjectivities; and, for the subject, the more restricted the space available for identification outside the hegemonic patterns of identification and

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[73] Le contexte se met en place par l'acte d'exclusion de quelque chose d'étranger, d'une altérité radicale. (Laclau, 2000. P.11 and 22).

[74] Howarth, 275, quoting E. Laclau and C. Mouffe.

[75] Sayyid and Zac ,261-262.

[76] Sayyid and Zac, 262.

[77] Howarth, 279.

subjectivities."[78] But, warns Sayyid and Zac, hegemonic discourses can never be entirely successful because they will never be total. [79] There will always be resistance to subvert the rules and limits imposed by the hegemonic project.

For Laclau, hegemony comes from the interaction between political groups. To be considered hegemonic, a given group cannot stay within close corporatist perspectives. It has to present itself as the bearer of wider objectives likely to appeal to the masses, objectives such as emancipation, order, or liberty. But, he insists, hegemony is not the result of an unstable equilibrium arising from a negotiated compromise between groups. In the process, and in order to be able to unite a great number of groups, this objective will, through a process of equivalency, progressively be emptied of its meaning to become what Laclau calls an "empty significant". [80]

Ironically, an empty significant becomes possible when its limits become the impossibility of its realization. The empty significant becomes the expression of what the society is missing to achieve plenitude.[81] It serves to rally groups and people around a wider idea, an idea of what is missing and worth fighting for. In the process, it tends to "dissolve differences" and provide "discursive resources" to create equivalent identities around the opposition to a perceived lack or absence.[82]

In a hegemonic project, antagonistic identities can also be weakened, displaced and even included into a dominant discourse by the expansion of the boundaries of the existing dominant system or by a decentring of the dominant system. "... a project employing a logic of difference attempts to weaken and displace an antagonistic polarity, while endeavouring to relegate that division to the margins of society."[83] This can be done by legitimating existing differences to include otherwise excluded identities into a dominant discourse. In such a strategy, differences can either be neutralized in a series of

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[78] Sayyid and Zac, 264.

[79] Sayyid and Zac, 262.

[80] In French, "signifiants vides". Ernesto Laclau, La Guerre des identities. Grammaire de l'émancipation, trans. Claude Orsoni (Paris/Éditions La Découverte/M.A.U.S.S, 2000),103-104. *« Cette façon de vider un signifiant particulier de son signifié particulier, différentiel, est donc ce qui rend possible l'émergence de signifiants « vides » en tant que signifiants d'un manque, d'une totalité absente. »Lalau, 2000, p.102*

[81] Ibid., p.94.

[82] Howarth, 277.

[83] Ibid., 277-278.

equivalencies, [84] or displaced in the decentring of a dominant identity to include some groups whilst excluding others at the margin.

Finally, changes can also occur, argues Howarth, from changes within structures or the lack of evolution of structures.[85] This is what Howarth calls structure failure. It comes, according to him, from a decentring of the structures that shatters collective identities and can lead to the questioning of existing structures and demands for change or replacement.

2.2.2 Analytical Framework for Risks and Reflexivity

In *Risk society*, Ulrich Beck makes an interesting suggestion: "…society today is *confronted by itself* through its dealings with risks."[86] Reflecting on environmental problems, he later wrote that threats from technological progress produce "conflicts that cast doubt on the social bases of rationality – science, law, and democracy" and that the "social power of threats" lies with the possibility to endanger institutions "that have produced and legitimized it" and the possibility to "trigger political reflexivity".[87] In this study, we assume that the various forms of risks that can be found in discourse carry the potential to challenge social and political organizations through a questioning of the work, capacity, credibility and legitimacy of institutions in charge of managing those risks.

Inspired by Rothstein, I here describe a model where social and institutional risks interact in decision-making (Figure 1). Institutional risks are defined as risks to organizations (state or non-state) regulating and managing societal risks, and/or risks to the legitimacy of their associated rules and methods.[88] This definition extends the idea of institutional risk to any political entity (political parties, politicians, NGOs) that uses reputation and credibility as a source of power and influence. If an entity can be the target of blame and liability, it can be affected by this type of risk and be compelled to

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[84] Ernesto Laclau, La Guerre des identities. Grammaire de l'émancipation, (Paris/Éditions La Découverte/M.A.U.S.S 2000), 97.

[85] But structures (institutions) can also be considered as participating to the dominant identity and thus included as participant to the discursive strategies described above.

[86] Ulrich Beck, Risk Society, 183.

[87] Ulrich Beck, Ecological Enlightenment, 30-32.

[88] Rothstein, 92.

manage it. These risks can be legal and/or reputational. They are caused by blame and responsibility in case of failure or omission (or perceived failure and omission). Both can lead concerned organizations to lose credibility and legitimacy, which can put the power structure at risk.

Social risks are here defined as risks to society and its environment. In this study, they include environmental, economic, health risks as well as ethical risks and risks to collective identity. Ethical risks are defined as threats to common shared values (justice, democracy, etc...). Risks to identity are defined as threats to the shared perception of who we were, who we are and what we should become as a collectivity. The expression of social risks can thus be determinant for preserving the credibility and legitimacy of a political system.

Credibility is in direct relation with methods used to manage risks and with the capacity of regulatory authorities in terms of the sufficiency of available expertise, the level of independence from private interests, and the adequacy of the rules empowering regulatory authorities. If an authorized product comes to have important adverse environmental and health effects, if a decision contradicts common shared values, if a decision comes to threaten how we see ourselves or how we project ourselves in the future; then institutions in charge are likely to lose some credibility. In a context of globalization and internationalization, trade agreements or, in the case of France, rules governing Europe can very well give citizens the impression that State governments have lost some if not all of their capacity to act in the interest of their respective constituencies.

The foundation of representative democracies establishes that every citizen lends her or his power to the authority representing them. But certain criteria have to be respected to preserve the legitimacy of those exercising power. For Scharpf, the exercise of power stays legitimate for as long as the authority acts in accordance with what is perceived to be the common good or acts according to the will of the people. According to the reciprocity principle, citizens give away their power in exchange for the certainty that decisions of the authorities will reflect the will of the people, or/and that these decisions and actions will promote the common welfare of the constituents.[89] For Coicaud, a power structure is legitimate only if it expresses the identity of the society it rules and if important values are protected and promoted within each sphere of decision.

[89] Legitimacy criteria as explained by Fritz Scharpf, Governing in Europe. Effective and Democratic? (Oxford: Oxford University Press, 1999).

[90] Finally, Laclau is of the opinion that what is legitimate is the project or ideas defended by the authorities and that a given hegemonic identity or hegemonic project will be perceived as legitimate as long as a society is able to identify with the project that the authorities offer and for as long as this project does not go against the society's identity.[91] The perception that this social contract is not respected can lead to various forms of questioning concerning the performances, competence and even intentions of those who take decisions in the name of the community. The expression of these doubts or the fears they generate can put institutions under pressure and create institutional risks. How then could discourse about risks, especially social risks, end-up affecting legitimacy?

In this model, the management of risks to health, the environment, the economy, ethical risks, and risks to collective identity can produce institutional risks which can have various impacts depending on which management level is questioned. It is hypothesized that threats to organisations (or the power structure) are articulated along three levels of discourse (see figure 1 and table 1). The first one questions the **methods** by which risks are evaluated and managed. The second one questions the **capacity** to successfully evaluate and manage risks. At the third level, it is the **will** of these authorities that is questioned. For each of the three levels, it is useful to distinguish the scale; national, regional or international and the nature of the organisation that is questioned. It can be hypothesised that the expression of doubts concerning the will of organizations will have more impact over credibility and legitimacy of these organisations than would questions about their methods or their capacity; and that doubts about the capacity will affect the credibility of institutions more than discussions about the methods. In this model, retroaction can be multiple and complex; a process which either serves to achieve better governance or to protect the existing power structure.

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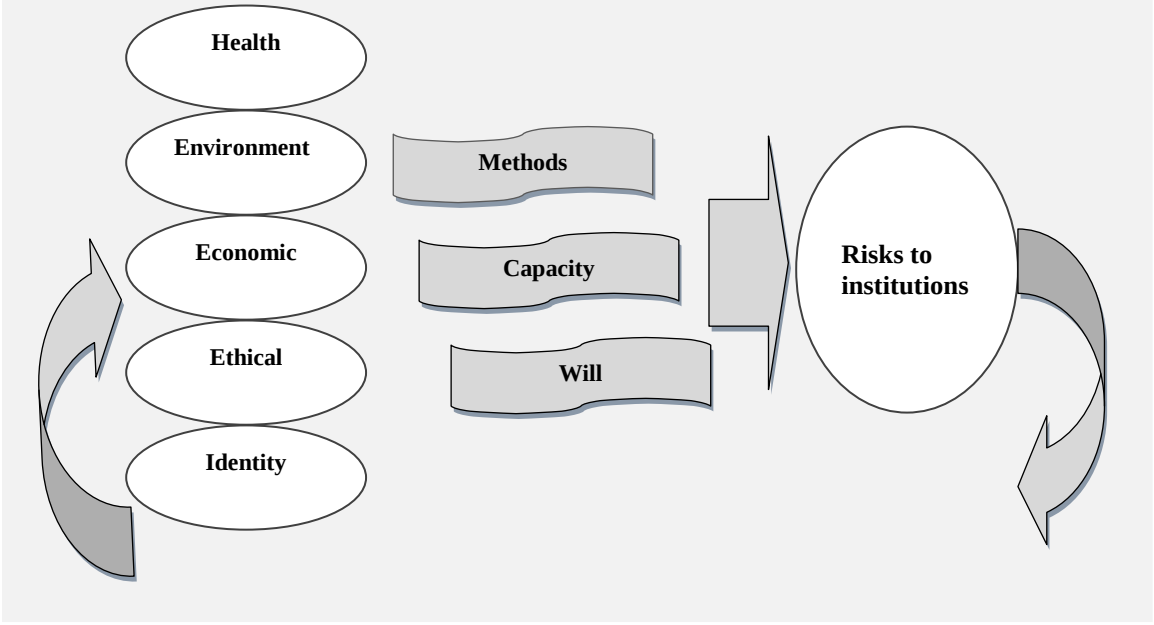
[90] « La fonction politique de coordination et de direction de la société n'est légitime que lorsqu'elle exprime l'identité de celle-ci. Mais la légitimité du pouvoir reste indissociable de la diffusion des valeurs du groupe à l'ensemble des systèmes d'action. » Jean-Marc Coicaud, Légitimité et politique. Contribution à l'étude du droit et de la responsabilité politique (Paris : Presses Universitaires de France, 1997), 23.

[91] Ernesto Laclau, La guerre des identités, 106-107.

Figure 1. Relationship between social and institutional risks



2.2.2.1 Level 1: Doubts about the Methods

Was the appropriate method used? Have we considered all relevant variables? Was the appropriate management tool employed? At this level, expert opinions are being debated and the discussion stays at the level of measure and evaluation of those tools used to evaluate and manage risks. Non-experts can participate in the debate but it represents a greater challenge to lay people. On the contrary, this level is more accessible to specialized interest groups and the scientific community.

In the analysis of discourse about risks related to genetic engineering, level 1 risks appear as discussions of risks to human health. These might include, for example, the risk to introduce allergens in foods. Or they might refer to risks to the environment. For

example, the Round-Up herbicide resistance gene might be transmitted to weeds to create "superweeds" that would spread uncontrollably in the environment. Finally, there might be predictions of economic decline if, for instance, these technologies are not implemented rapidly or if their development is slowed down. Discussions about the appropriateness of certain regulations are also part of this discourse level. The possibility that farmers would become more economically dependent on multinationals in buying farm inputs and the consequences for the financial health of their farms is also part of level 1 risk. Expert status and the scientific qualities and rigor of predictions and explanations brought forward are here important components of trust.

2.2.2.2 Level 2: Doubts Problem Solving Capacity

As risks to the environment, health or economy are being debated, another type of risk emerges, this time from a lack of trust in the capacity of institutions in charge of defining, evaluating and managing risks to actually choose or use the best methods to control risks. At this second level, risk comes from the incapacity, admitted or not, perceived or real, of authorities to take appropriate measures to protect the population from environmental, health, social or economical risks. Trust is here contingent upon the belief that the state or the administrative authority has the necessary powers and required capacity to choose appropriate methods to perform their duty towards the country or the region. Does the State or does the administrative authority have all the resources it needs to assess and manage risks (money, expertise, time, human resources)? Are decision-making processes efficient? Do they allow for efficient exercise of power? Is it equipped to undergo efficient risk monitoring and efficient risk management? If institutions in charge are perceived as incapable or incompetent to protect against social risks or to promote certain social values, it could generate social insecurity with its corresponding institutional risks.

Experts and expert institutions can also be questioned about their capacity to respond to new demands for evaluation, management or risk monitoring. Do they have all the resources they need to do the work (human, financial, infrastructure) given rapidly evolving technologies? At this level, it is doubt as to the capacity of experts to evaluate risks properly that causes the impression of risks. Science and experts may lose some credibility as contradictory results are put forward and as predictions are being refuted. Lay knowledge is also questioning science and experts as life experience and local reality confront predictions. Discourse goes then from level 1, discussions concerning the

methods used to obtain results, to level 2, discussions concerning the competence and capacity of experts to choose the right methods. Are there contradictions between what experts predicted and what happened? Do institutions in charge of defining, evaluating and managing risks have sufficient human and financial resources to keep up to date with a rapidly evolving technology? Do they have all the information necessary to take good decisions?

In the biotechnology debate, level 2 risks emerged, for example, in the discourse surrounding France's « valse-hésitation » in the BT corn file: authorization followed by partial banning, followed, in turn, by partial authorization… These events gave the impression that the authorities were simply unable to take coherent decisions and that the experts having recommended to authorize BT corn lacked competence. The same is true of the labelling issue in Europe when products were ready to be put on the shelf before the rules were even enacted, leaving the population with the impression that these institutions in charge were unable to take decisions and implement sound regulations.

2.2.2.3 Level 3: Doubts about the Intention

This third level of risk is related to the way people judge the intention of institutions in charge. At this level, risk comes from a shared perception that they do not have the will or the intention to protect health, the environment, the economy or social structures. At this level, it is the legitimacy of institutions that is at stake. Are they sincerely trying to protect the public? Are they sincerely working for the welfare of the constituents and in accordance with their will? Or are they working to protect special interests against the will of the population? Institutions are mistrusted and will generate insecurity if it is perceived that they do not have the will to protect and promote certain social values.

Is it felt that health and the environment of the country or the region are real priorities for responsible authorities? Do they have the **will** to act according to shared principles? For example, are democratic values respected? Did decision-making processes respect agreed upon rules? For example, were consultations made in accordance with prevailing rules of inclusiveness and participation? Were institutions in

charge of evaluating and managing risk sufficiently independent of private interests[92]? Were decision-making processes transparent enough and inclusive enough? Do decisions and actions respect and promote common social values? Are experts and expert institutions really independent from special interests? Do they have access to all the information they need from independent sources or do they rely on companies' information to evaluate products? These questions could all lead to questioning the intentions of the authorities.

Interestingly, all levels are interrelated and the analysis will have to take this into account. Incapacity can be interpreted or framed as the absence of a will to act upon a given problem and contradictory evaluations of risks can be interpreted as lack of capacity to do proper risk evaluation. The absence of an intention to act can, in other respects, be hiding under the excuse of a lack of capacity to act. For example, the absence of specific biotechnology legislation in Canada could be interpreted both as lack of capacity or as the absence of a will to act upon this issue.

[92] The capacity of the state to gather and process its own data about a particular situation and the nature of the linkages between the different actors and the authorities in charge of the decision are good indicators of the level of independence of the decision making process. These criteria of state independence are taken from Linda Weiss, The Myth of the Powerless State: Governing the Economy in a Global Era, (London: Polity Press, 1998)

Table 1: Levels of institutional risks.

Level of institutional risks	The Methods Level 1	The Capacity Level 2	The Will Level 3
Erosion of trust concerns...	...the *accurateness* of evaluations and/or management tools	...the *capacity* of institutions in charge	...the *intention* of authorities in charge
Level of the debate	Was the risk properly evaluated? Were proper tools used to measure and contain risk? *Was the choice of public policy instruments appropriate, efficient?*	Do authorities in charge have proper tools, resources and competence to evaluate and manage risk? *Are they capable of building and choosing appropriate policies?*	Do authorities in charge have the intention to protect society from risk? *Do they really have the intention of adopting the best possible policies and regulations?*
Risk expressed as...	Was risk well evaluated, and measured? Was it well managed?	Do they have the capacity in terms of knowledge, expertise and power to protect from risks?	Do they have the will to protect from risks?

What will matter, in the end, is the way the dominant discourse will frame the issue and define the risks. Will it be portrayed as a matter of methods, of capacity, or as a lack of intention to protect from social risks? It can also be hypothesised that the degree of visibility and transparency of the object of risk combined with the degree of transparency and visibility of managing institutions will have an impact on the level of reflexivity of the discourse as well as on the likelihood that a reflexive process will come to take place.

CHAPTER THREE

Background

Biotechnology is not a sector but a broad enabling technology,[1] an umbrella term that covers a broad spectrum of scientific tools.[2] Processes that use "living organisms, or parts of living organisms, to make new products or provide new methods of production"[3] all qualify as biotechnology. These include processes of production of beer, bread or wine, which men and women have used for centuries.[4] The same is true of the selection of some genetic traits of animals and plant varieties with traditional breeding techniques.[5]

Among the techniques used in biotechnology, genetic engineering is more recent. Also called genetic manipulation, *transgenesis*, or recombinant Deoxyribonucleic acid (DNA) technology, it seems to be raising the most concerns while it also promises a lot in terms of innovation. It goes further than *classical biotechnology*; putting to profit the universality of the genetic code, it allows the barriers of species to be transcended by transferring genes from one species to another.[6]

"*The recombinant technology… involves a set of techniques that allows scientists to use special enzymes to cut into pieces the long double strands of molecules that make up DNA and then to recombine the pieces with the DNA of a carrier, called the 'vector.' These recombined molecules are then inserted into a host where they will presumably*

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[1] OECD, Biotechnology Economic and Wider Impacts (Paris: OECD, 1989); Canadian Biotechnology Strategy Secretariat, The 1998 Canadian Biotechnology Strategy: An Ongoing Renewal Process (Ottawa : Distribution Services, Industry Canada, 1998).

[2] Canadian Biotechnology Strategy Task force, The Canadian Biotechnology Strategy Online (1998) http://strategis.ic.gc.ca/cgi-bin

[3] Murray McLaughlin, "Food Biotechnology – An Overview," Workshop on Food biotechnology, Ottawa, Canada: Agri-food Safety and Strategies Division, 29 March 1993), 25.

[4] Canadian Biotechnology Strategy Secretariat, The 1998 Canadian Biotechnology Strategy. OECD, Biotechnology Economic, 1989.

[5] François Pothier, "Le siècle biotech ou la nature retricotée," Argument 1, no.2 (1999), 110.

[6] Pothier, 110; Jean Bizet, Transgéniques: pour des choix responsables, Rapport d'information 440 (97-98) (Sénat : Commission des affaires économiques, 1998), last accessed February 03, 2011 http://www.senat.fr/rap/r97-440/r97-440.html); Axel Kahn, « Évaluation du risque et dissémination volontaire de plantes transgéniques : l'expérience française, » in Les plantes transgéniques en agriculture. Dix ans d'expériences de la Commission du Génie Biomoléculaire, dir. Axel Kahn (Paris: John Libbey Eurotext, 1996),12.

propagate. By combining the foreign DNA into a vector that typically replicates in the host organism, scientists are able to introduce "expression" of the foreign genetic material in the new host. 7"

This set of newer techniques using recombinant DNA, cell multiplication and bioprocesses for commercial purposes is sometimes referred to as the *new biotechnology.*[8] This new biotechnology allows for the production of different products such as useful enzymes or proteins. It is also used to produce genetically modified organisms - multicellular and unicellular life forms presenting different characters than the original form because it allows the scientist to select desired characteristics with greater precision and to exchange characteristics from one species to another: micro-organisms, animals or plants.[9] For example, the natural functions of a plant or an animal can be modified in order to make it produce certain substances it would not do otherwise.[10]

Because of all these implications, it was predicted that the new biotechnologies would have revolutionary implications for science-based industries such as pharmaceuticals and food.[11] In the special case of the agro-food industry, it has the potential to reshape "the links between the participants in the food chain"; it offers new opportunities for the food industry to enhance "the health and nutritional profile of food products," to create "new flavours", to improve "product functionality", and to enable "the creation of entirely new products."[12] Because they could mean significant cost reductions at every step of the production chain, it was very early believed that products of biotechnology could have non-negligible impacts on the competitiveness of many players

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[7] Charles Perrow, Normal Accidents. Living with High-Risk Technologies (New York : Basic Books, 1984), 296-297.

[8] Lawrence Bush, Plants, Power and Profit: Social, Economic and Ethical Consequences of the New Biotechnology (Cambridge: Blackwell, 1991), 1.

[9] Axel Kahn, « Évaluation du risque et dissémination volontaire de plantes transgéniques : l'expérience française,» p.12.

[10] This latter category of modified organisms is called bioreactors.

[11] Oliver L. Amalya and J. P. Liesbeskind. "Three Levels of Networking for Sourcing Intellectual Capital in Biotechnology: Implications for Studying Interorganizational Networks," International Studies of Management and Organization 27, no.4: 76-103 (1997): 1.

[12] Cook *et al*. argue that "...for decades, innovation in the food industry has been essentially incremental." Biotechnology is, according to these authors, an "opportunity for brand and product managers to go beyond gradual improvements and use the potential of biotechnology as a licence to be creative." John D Cook et al., « Food Biotechnology: Can You Afford to be Left Out? » McKinsey Quarterly 3, no.78 (1997): 2-8, 8; see also Amalya and Liesbeskind, 3-4.

of the industry. Those who would not conform were threatened with being rapidly marginalized.[13]

In the case of genetically modified plants, applications vary widely. Plants have so far been created to be grown more easily and at lesser cost by introducing genes that can either give the plant the ability to resist the attack of insects or diseases (Bt corn, NewLeaf potato), or allow the plant to tolerate the use of wide spectrum herbicides such as glyphosate (Roundup Ready soybeans, canola or wheat). Other possibilities include the creation of plants that would require less fertilizers or resist harsh climatic conditions (drought or salt); the improvement of nutritional characteristics for human or animal feed (golden rice); the improvement of certain traits judged useful by the food industry (higher level of certain proteins, fatty acids); or to improve shelf life of certain products such as ripened fruits (Calgene's Flavr Savr tomato). Agricultural plants are also being created to produce new substances such as drugs or drug components, enzymes, or fuels.[14]

Among the variety of biotechnology products, the category of live modified organisms seems to stimulate people's imagination in a special way because of possible interactions with the environment. Central to discussions and fears is the idea that this powerful tool could produce dangerous life forms, viruses, bacteria, and plants.[15] For example, the prospect of their reproduction brings people to fear it would become impossible to control the spread of these organisms. The use by Greenpeace of a giant puppet in the shape of an angry-looking corn ear at the Montreal conference on biosecurity in January 2000 was no accident[16]. The idea that genetically modified organisms (higher plants or animals) could be "released" in nature where they could multiply and transform living plants and animals captures popular imagination. Genetically modified plants concern consumers in a special and intimate way because these products threaten to end up "incognito" on the shelves of the nearest supermarket and in the foods we eat.

Possibly amplifying the uneasiness created by biotechnology is the way this technology affects how life is seen and valued. According to de Rosnay, biology has

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[13] Cook *et al*., 4.

[14] Axel Kahn, « Évaluation du risque et dissémination volontaire … » 12-13; Guy Riba et Y. Chupeau. « Les plantes génétiquement modifiées : les enjeux, » Cellular and Molecular Biology, 47 (2001): 81-92.

[15] Axel Kahn, Société et révolution biologique. Pour une éthique de la responsabilité,» (Paris: INRA, 1995), 19.

[16] Isabelle Paradis, «Biosécurité. On démarre dans l'optimisme,» Terre de Chez Nous, 27 January to 2 February 2000, 1-2.

gone through a series of changes: from a descriptive biology classifying species; to an explicative biology with the discovery of DNA and the development of molecular biology; to a transformative biology with the development of genetic engineering. Recently, biology has become participative and human beings have become the subject and the object of their own experiments. Rosnay argues that, with biotechnologies, life sciences and techniques have become part of a global industry.[17] These technologies have contributed to a vision of life in mechanistic terms, as a useful source of information with a utilitarian value.[18] News about companies patenting higher life forms - and even some individuals' DNA codes tend to reinforce this view that life itself has become an instrument for profits. Beyond the impression that genetic engineering goes against nature, some even dread that it will become a tool of economic imperialism because only wealthy nations can afford such high level research. In a context of globalisation, some also fear that multinational companies will come to impose their products against the will of governments and of populations.

Biotechnology is already applied to many industrial sectors: the pharmaceutical industry, agriculture, forestry, foods and feeds, chemicals, mining, environment (bioremediation), health care, and aquaculture.[19] The applications of genetic engineering are and will likely be multiplied in various ways with the growing convergence between biotechnologies, infotechnologies, nanotechnologies and microelectronics.[20] For these reasons, it is very difficult to have a precise account of the economic impact of this technology. Nevertheless, many countries, including France and Canada, were quick to consider this technology as a strategic component of competitiveness and international growth[21]. It was not believed that biotechnologies would create wealth and employment

[17] Joël De Rosnay, "De la biologie moléculaire à la biotique : l'essor des bio-, info et nanotechnologies,» Cellular and Molecular Biology, 47 (2001): 10.

[18] Grimaud, Jean-Alexis, « Élever le rendement sociétal de la recherche : l'enjeu des biotechnologies, » Cellular and Molecular Biology 47 (2001): 5. In Grimaud's words: "valeur d'usage".

[19] OECD, Biotechnology Economic, 38-39; Industry Canada and Department of Foreign Affairs and International Trade, Canadian Business Strategy, 1998/9, accessed 1999. (http://strategis.ic.gc.ca/SSG/bo01087e.html)

[20] De Rosnay, « De la biologie moléculaire à la biotique … », 9.

[21] Jean-Claude Pelissolo, La biotechnologie, demain ? Rapport au Premier ministre, (Paris: Secrétariat d'état à la recherche, 1980), 39; Canadian Biotechnology Strategy Secretariat, The 1998 Canadian Biotechnology Strategy, 7.

in a near future, but governments in both these countries were convinced it would be determining in the medium term for the competitiveness of many economic sectors.[22]

The following pages provide a brief overview of the early development of genetic engineering and of the circumstances that led to the internationalization of the debate. It also sketches out briefly the measures that were put forward in France and in Canada to control research. Finally, this chapter offers an examination of the measures that were taken by France and by Canada to develop biotechnology industrial applications in the sectors that they thought would be the most promising. A report of the OECD stated that biotechnology in agriculture and food is a scientific revolution but noted that whether it would introduce fast changes in the sector would depend on many factors such as safety, public acceptance, policies, and industry involvement and investments linked to perceived economic profitability.[23] France and Canada ended up both juggling with these factors. With their own strengths and weaknesses, they both attempted to position themselves in order to reap the benefits of this new technology.

3.1 Early Development: the Internationalization of the Debate

The polemic about genetic engineering started early in the 1970s with concerns expressed about the nature of experiments and the environment in which they were being done. As Alan Russell relates in The Biotechnology Revolution (1988), the "Berg experiment" is considered the first step in a chain of events leading "to the international discussion of potential hazards and the development of experimental guidelines."[24] The experiment that Berg, then a professor at Stanford University, was about to conduct in

[22] « En définitive, l'effort d'adaptation aux biotechnologies doit être poursuivi, non parce qu'elles permettent une expansion de l'activité par de nouveaux produits par exemple ni en raison de la certitude qui pourrait entourer leurs perspectives d'utilisation industrielles – et moins encore de chiffre d'affaires – mais par ce que, à l'instar de la productique, elles constitueront sans doute un jour un élément de compétitivité déterminant dans certains secteurs. », Commissariat général du Plan, L'application des biotechnologies dans l'industrie chimique (Paris: La documentation française, 1985), 14.

[23] OECD, Biotechnology, Agriculture and Food (Paris: OECD, 1992), 11 and 166.

[24] Alan M. Russell, The Biotechnology Revolution. An International Perspective, (New York: St.Martin's Press, 1988), 41-42.

1971 consisted of implanting a virus, known to cause tumours into newborn hamsters[25], in *E. coli*, a bacteria of the human digestive track. People working near him alerted him to the potential health hazard, because they feared that this modified bacteria could end up in the digestive track of humans where it could cause cancer. This question led Professor Berg to consult other specialists in the field of microbiology. Although no one had a clear answer, his consultation contributed to launch a debate, which gained momentum around the world. In 1972, a meeting was held at NATO to discuss the political and social consequences of genetic engineering. Later that year, the US National Institutes of Health (NIH) established a Biohazards Committee. The US National Institute of Allergy and Infectious Disease (NIAID), whose mandate was «to control the supply and use of possibly hazardous hybrid viruses», also took action.[26] Scientists who wanted to use this material had to sign a memorandum of understanding to show that they had understood the security precautions involved in the manipulation of this material. In 1973, Berg, who had come to consider biohazards very seriously, organised a conference on the subject: the Assilomar Conference on biohazards. « It was noticed that no hard evidence was presented to prove conclusively specific hazards, yet an awareness of overall hazard was fostered. Equally of note was that ethical and moral questions were not raised, as they had been at the NATO meeting. »[27]

In the spring of 1973, after Cohen and Boyer succeeded in inserting DNA from one plasmid into another, the participants at a special session addressing this issue voted to request that the National Academy of Sciences (NAS) establish « a study committee to recommend specific actions or guidelines. »[28] This committee was formed and, led by Berg. It started the process by writing a letter. The « Berg letter » as it was later referred to, went through a series of drafts, and in the process, was discussed in the US and abroad.[29]

The letter requested the deferment of two types of experiments until hazards could be evaluated: (1) the construction of new self-replicating plasmids that could introduce novel combinations of resistances (among which the resistance to antibiotics) (2) the linkage of DNA from oncogenic or viruses to self-replicating DNA elements. It asked

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[25] According to Perrow, this virus was the Simian Virus 40 (SV40) known to cause tumours in monkeys, not hamsters. Charles Perrow, Normal Accidents. Living with High-Risk Technologies, (New York: Basic Books, 1984), 296.

[26] Russell, The Biotechnology Revolution, 43.

[27] Ibid., 44.

[28] Ibid., 45.

[29] Ibid., 47.

that great care be taken in linking animal DNA to plasmid or bacteriophage DNA because of the uncertainty related to creating new rDNA with unknown properties. It requested that the NIH establish an advisory committee that would oversee experimental programmes and estimate hazards; develop procedures to minimise the spread of such molecules (rDNA) in human and animal populations, and devise guidelines for investigator use. Finally, it is important to note that the letter also asked for the work to continue as soon as possible, "under appropriate precautions".

Although it did not call for it, the letter was followed by a moratorium. It was strong enough to defer many experiments. According to Russell, in most countries, the letter made a sensation in the scientific community, but not in the public. In the US, however, the press made it sensational news.

These events took place in an era of growing environmental concerns, in particular, at a time when the debate about nuclear energy was strong. Russell refers to it as a period of growing distrust in science and of growing concern about the impacts of technology on the environment. « If man had apparently ransacked nature in the past, some people were to see genetic manipulation as the start of his ability to control the essence of life itself with untold consequences for nature. »[30] The possibility that this technology would be used to create new weapons had also been a concern at a conference in Baden, in 1974.

But many scientists were getting impatient to continue the work in this area. The Assilomar II Conference was held in February 1975. There, some scientists hoped to put an end to the seven months moratorium, arguing that it was delaying foreseen benefits and was against academic freedom. Many felt that these guidelines were inhibiting innovation. During the moratorium, some were even discovered working with prohibited viruses or vectors.

The effort to «regulate» was complicated, according to Perrow, because all accident scenarios were hypothetical and because this promising scientific field could have high commercial potential. Within a few years, serious concerns by the scientific community about the risks of these experiments had transformed into aversion and resistance for any non-voluntary regulations on DNA research. The scientific community in general, "faced with the prospect of stringent federal guidelines… began to reassess the risks of DNA procedures in order to calm the surge of public fear".[31]

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[30] Ibid., 61.
[31] Perrow, Normal Accidents, 298-302.

According to Russell, « the parameters of policy search were relatively narrow around the world » and as an international competitive momentum was building-up to get on with the work it became evident that more restraint on research would have a negative effect on competitiveness. The general like-mindedness of many participants in policy making also contributed to this generalized tendency to go on with the work.[32] "By the 1980s benefits of genetic manipulation had already accrued in a wide variety of areas, including quite simply the vast increase of fundamental knowledge. (…) But in the early years of the genetic manipulation debate the benefits, like the risks, were also conjectural."[33]

3.1.1 Regulating Research

In France, Canada, and most "scientifically developed" countries, the scientific community was well aware of the debate surrounding the risks of genetic engineering. For Russell, there was, following the Assilomar conferences and the Berg letter "…a transnational framework of common knowledge and communication."[34] It is in this context of international awareness of the scientific community that research guidelines were soon put in place in France (1975) and later in Canada (1977). In both cases, the Berg letter played an important role in alerting the scientific community to this problem.

After having been recommended by the *Conseil national de recherche scientifique* (CNRS) not to use a subsidy for research using genetic manipulations, a French scientist, Philippe Kourilsky decided in 1974 to mobilise other French scientists also interested by this type of research. Together, they asked the *Délégation Générale à la Recherche Scientifique et Technique* (DGRST)[35] to organise a control system. A similar request claim came from the French representatives to the European Molecular Biology Organisation. These pressures convinced the DGRST to create a structure that would be in charge of these questions.

In March 1975, France, through the DGRST, put in place a set of voluntary norms and created the Commission de contrôle, later called the Commission de classement des

[32] Russell, The Biotechnology Revolution, 218-219.
[33] Russell, 177.
[34] Ibid., 164.
[35] Main research body responsible for science coordination between the French research councils. in Russell, The Biotechnology Revolution,138.

recombinaisons génétiques (here refered as the Commission de classement). The Commission de classement reviewed research proposals involving in vitro recombinant DNA. It was composed exclusively of scientists. A convention was signed between the DGRST and the main French research institutions[36] in which they agreed to submit for approval any experiment involving in vitro genetic manipulation. Only those research institutes that agreed to sign the convention were submitted to the guidelines. These voluntary norms would govern only in vitro genetic manipulations; they concerned measures of physical and biological confinement and the competence of those manipulating these products (formation des manipulateurs). Using the information given by the scientists applying for the review, the Commission de classement classified the project according to a predetermined level of physical and biological confinement. This evaluation was then transmitted to the head scientist, to the laboratory as well as to the " Instance locale de surveillance[37]" Research institutes were thus in charge of controlling these activities themselves and the only sanctions for non-compliance to the norms were disciplinary. According to Royer, due to the technical character of these manipulations, the only true control was made by colleagues.[38] In the case where a project raised ethical issues; the Commission de classement could refer the case to an ethics commission. In practice however, no project was ever submitted to this Commission d'éthique.

There had been attempts made by the EEC, since 1977, to adopt a Directive on genetic manipulation "which would have compulsory legislative effects in the member-states". "The objective was to harmonise the precautions taken in the member states regarding recombinant DNA research." [39] Debates around this proposal opposed the perceived need to protect humans against their own achievements and the perceived need for flexibility in such a rapidly evolving research field. After two years of discussions, the EC opted for a non-binding Recommendation which came into form in 1981. Its main provision was the registration of recombinant DNA work.[40] But parallel to this will to harmonize regulations across member countries was the will to encourage research

[36] This convention was signed voluntarily by the main French research institutions (CNRS, INRA, Institut Pasteur, INSERM and CEA).

[37] Put in place by the research institute, this instance is in charge of making sure that the commission's recommendations are being observed. In P. Royer, Rapport du groupe de réflexion sur la sécurité des applications industrielles des biotechnologies (Paris: Ministère de l'Industrie, Mai 1981), 44.

[38] « Le fonctionnement de la commission de classement de la DGRST aboutit, en fait et en droit, à un système d'auto-contrôle de la communauté scientifique dans le domaine des recombinaisons génétiques in vitro.» in P. Royer, Rapport du groupe de réflexion sur la sécurité des applications industrielles des biotechnologies, 43.

[39] Russell, 156.

[40] Ibid., 158-160.

because it was believed that the US and Japan had a considerable advance compared to Europe. In 1980, the Commission announced a 5-year program for research. Forty-nine point five million of UCE was to be shared between the private and the public sectors.[41]

In Canada, Guidelines for the handling of recombinant DNA molecules, animal viruses and cells were adopted by the Medical Research Council (MRC) in February 1977. It was the product of an Ad Hoc expert Committee of the MRC.[42] Raising little public attention and with the quasi-absence of controversies about recombinant DNA technologies, the making of these directives was treated as an administrative problem, not a political one.[43] Although scientists were consulted regularly, it was not meant to reach a consensus and was kept out of public attention.[44] The permanent MRC's Biohazards Committee, consisting mainly of non-specialists of the field of genetics (both scientists and non-scientists), was to be in charge of their application. Throughout this process of designing guidelines and even afterward, Canadian scientists had kept close contact with what was going on the international scene, sending representatives to international conferences such as the Assilomar II or to the European Science Foundation's (ESF) liaison Committee, and keeping close links with the US Centre for Disease Control and international experts.[45]

In the view of the Ad Hoc Expert Committee, one of the major difficulties in making recommendations for these guidelines was the lack of information about the potential hazards to human health and the necessity to make recommendations based on supposition and potential rather than on scientific evidence. These guidelines were mandatory only when receiving financial support from the MRC[46] but, because these techniques were not used exclusively in medical research, the committee expressed its

[41] « Recherches communautaires dans le domaine du génie biomoléculaire, » Communauté européenne informations, 15 février 1980.

[42] Composed of experts in the field of genetics, microbiology, public health, biochemistry, biology, medecine, and law, with two representatives from the MRC and an observer from the NRC.

[43] Conseil des sciences du Canada, Le pouvoir réglementaire et son contrôle, Rapport no.35 au ministre d'État chargé des Sciences et de la Technologie (Ottawa : Ministère d'Approvisionnement et Services Canada, Octobre 1982), 35.

[44] Howard Eddy, La réglementation des recherches sur la recombinaison génétique. Le dossier de trois pays, (Ottawa : Conseil des sciences du Canada, 1983), 77.

[45] Russell, 141 and 151.

[46] "Adherence to the requirements for containment of experiments involving recombinant DNA molecules and animal viruses and cells is required of all who obtain MRC grants, and this document should be considered as part of the MRC Grants and Awards Guide." in Medical Research Council of Canada, Preface to Guidelines for the handling of recombinant DNA molecules, animal viruses and cells (Ottawa: Minister of Supply and Services, 1979).

wishes that these guidelines be known and used by the NRC as well as by government laboratories.

The *GUIDELINES FOR THE HANDLING OF RECOMBINANT DNA MOLECULES, ANIMAL VIRUSES AND CELLS* were not binding upon industry because it was believed that legislation would reduce flexibility in an area of such rapid change.[47] Compliance with these guidelines was thus made mandatory for industries only if public research subsidies were involved. Moreover, secrecy concerning the research conducted by the private industry was a true barrier to useful inspection by the MRC's Biohazards Committee.[48]

The Canadian guidelines had a wider scope than the French guidelines that concerned only in vitro genetic manipulations. However, similar to France, these guidelines were voluntary and applied only to projects receiving public subsidies from certain sources. In both cases, the better part of the responsibility lay with the principal investigator and the research institutions. The Biohazards Committee did not have to report to a minister because no ministry was responsible and the MRC had no regulatory powers, just the allocation of subsidies as an incentive.[49] In France, however, there was a clear governmental involvement with the direct implication of the DGRST which had to sign the conventions. In both cases however, the role of the committees in charge was administrative only, contrary to the British Genetic Manipulation Advisory Group (GMAG) or the Recombinant Advisory Committee (RAC) in the US that both carried a political role and included public consultation processes.

In Canada, it was also the principal investigator who had to ensure that proper precautions were taken in accordance with the guidelines. Research institutions were bound to monitor the facilities and the procedures and to give support and information to principal investigators. To do this monitoring, they were encouraged to establish a Biohazards Committee which was to be in close contact with the MRC's Biohazards Committee[50] in charge of ensuring that information concerning the implementation and

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[47] Task Force on Biotechnology, Biotechnology: a Development Plan for Canada, report to the Minister of State for Science and Technology, (Ottawa: The Task Force, 1981), 33.

[48] Stuart Ryan, member of the MRC's Biohazards Committee, quoted in Conseil des sciences du Canada, Le pouvoir réglementaire et son contrôle, 30.

[49] Conseil des sciences du Canada, Le pouvoir réglementaire et son contrôle, 36.

[50] The initial composition of the MRC's Biohazards Committee was comprised of 5 non-scientists and 4 scientists.

effects of the Guidelines were followed to the research institutions. Ultimately, it was the MRC who determined the containment level that was required.[51]

The early development of genetic engineering was marked by reflection based on conjectured risks of a new technology. This reflection on possible risks and on precautions necessary to protect the environment and human health was, however, short-lived as conditions of internationalization of the issue and the very nature of the technology led to the emergence of a climate of competitiveness and even secrecy within the scientific community and between countries. "Scientists, as a group, invariably saw a future of increasing benefits, set against a future of declining risk, a powerful argument for the work to continue."[52] Most industrialized countries were eager to capture the promises of economic development if not simply worried to be left behind in the innovation race. It was believed that those who do not "jump in" would be left behind. Furthermore, no structure at the international level was there to control or monitor the race for innovation that followed in many industrial countries.

3.2 R&D Strategies and Restructuring the Research/Industry Relationship

After many years of incident-free research and no obvious ecological problems, the scientific community became confident that the benefits of genetic engineering would surpass the risks. Because biotechnology research was risky and expensive, the need for the public sector to get involved was rapidly widely recognised. While the U.S and Japan had already started investing in biotechnology research and development, for France and Canada, the late 70s and early 80s were marked by growing consciousness of the economic and industrial stakes of genetic engineering. During this period, both countries launched a discussion on the issue. Whilst in France issues of security, ethics, and public opinion were part of the debate, in Canada, these issues did not attract much attention and discussions during this period concentrated almost exclusively on research and industrial development. Despite these differences in the range of issues raised, France was just as fast to recognize the strategic importance of this new set of technologies. Both countries

[51] Medical Research Council of Canada, Guidelines for the handling of recombinant DNA molecules, animal viruses and cells (Ottawa: Minister of Supply and Services Canada, 1977).

[52] Russell,178.

worked to define strategies for research and industrial development that would allow them to reap the benefits of this new technology. The period that followed was characterised by the adoption, in France as well as in Canada, of measures to bring together research (mostly public at the time) and industry. This public sector start-up role was, and is still deemed crucial for capturing commercial benefits from research innovations in a competitive environment in cases of science based-industries.

3.2.1 Canada

In Canada, a discussion was officially launched by the federal government in 1980 with the creation, by the Ministry of State for Science and Technology (MOSST), of a private sector Task Force on Biotechnology to examine the opportunities for the development of this technology in Canada's industry. This task force consisted of scholars, scientists from industrial research laboratories and representatives of the MOSST.

In its 1981 report, the Task Force on Biotechnology drew this non-enviable picture of the situation of biotechnology in Canada: "A practically non-existent biotechnological industrial base, a rapidly shrinking federal government research capability, and a highly fragmented and unfocussed university effort are the major features of Canada's current biotechnological activities." [53]

Believing that biotechnology would be a major factor in world industrial development, it concluded that Canada's competitiveness in many sectors, including agriculture and food, would erode unless it was successful in developing and maintaining a biotechnological industrial capacity. The natural resource sector was especially targeted in its analysis. "If Canada's resource industries fail to innovate through biotechnology, their competitiveness in world markets will be jeopardized."[54]

In 1981, the Task Force made a series of recommendations in which it called for long-term policy guidance on the part of the Federal Government and for additional money to be injected for biotechnology in existing research programs. This call for government intervention resulted in 1983 in the announcement of the first Canadian

[53] Task Force on Biotechnology, Biotechnology: a Development Plan for Canada (Ottawa: Report to the Minister of State for Science and Technology, 1981), 14.

[54] Task Force on Biotechnology, 3.

Biotechnology strategy. This strategy stated that biotechnology was "an important emerging technology area highly relevant to Canada's industrial development and natural resource economy." Its objective was to "provide federal policy guidance and programme support to encourage the concerted action necessary to make commercial progress."[55] The National Biotechnology Strategy (NBS) contained five major components:[56]

- The creation of the National Biotechnology Advisory Committee (NBAC) composed of senior representatives of the government, scholars and industry representatives.[57] This Committee would advise the Minister of State for Science and Technology on the implementation of the strategy. The Interdepartmental Committee on Biotechnology was also created by the NBS at the associate deputy minister level to oversee and co-ordinate policies through mandated working groups.
- The identification of four strategic priority areas: human and animal health care, mining and mineral leaching; plant strain development and nitrogen fixation; cellulose utilisation and waste treatment.
- Incentives to encourage industrial development and technology transfer with the help of federal funds through the NRC's Industrial Research and Assistance Program (IRAP) and a biotechnology cost-share Program for Industry/Laboratories Projects (PILP) and more research funding through thematic programs of the National Research Science and Engineering Council (NSERC). According to Hollebone, these incentives also included the establishment of centres of excellence to promote cross-sector partnerships. University, government and private sector laboratories were invited to participate.
- Networks to increase the industrial relevance of biotechnology research. Seven sector-specific biotechnology networks were formed in priority research areas, each to be administered by a federal department. Membership was open to industry, government and universities. Two were co-ordinated by Agriculture

[55] National Biotechnology Advisory Committee, Annual report to the Ministry of State for Science and Technology (Ottawa: Minister of Supply and Services Canada, 1984), 10.

[56] National Biotechnology Advisory Committee, Annual report, (1984) 10; Conseil des sciences du Canada, Germes d'avenir. Les biotechnologies et le secteur primaire canadien, Rapport 38 (Ottawa, le Conseil, septembre 1985); Dr. Jean Hollebone, "Agriculture Canada's Activities in Biotechnology" in Proceedings of a Workshop on Food Biotechnology (Ottawa, 29 March 1993), 3.

[57] This committee is said to be drawn predominantly from industry. In Judith Miller and William Smith, "Biotechnology and Canadian Agriculture," Biotechnology 1, no.10, (December 1983), 865.

Canada: one on nitrogen fixation and the development of plant strains and the other on human and animal care products.

- New research facilities. The former Prairie Regional Laboratory was to be developed into a plant biotechnology institute. Agriculture Canada committed $6 million to the project. A biotechnology institute was to be built in Montreal. Its wide mandate included agriculture and food and $61 million was committed to this project.

Although planned to match perceived needs, the means to achieve this strategy remained ill defined according to Miller and Smith[58] and the investments made by the Federal Government were still significantly lower than other countries such as Japan, France or Germany who started their investments earlier.[59] In 1980, Canada was estimated to be "four or five years behind the leading industrialized countries."[60] Canada, with its resource-oriented economy, complex jurisdictional infrastructure and extensive land base, also faced important problems because it was less well developed industrially than other scientifically developed countries, including France. According to Miller and Smith, there was a quasi-absence of a pharmaceutical industry and a weak food processing industry, including the absence of non-brewery fermentation industries.[61] According to the Office of Industrial Development, Canadian industries that could take advantage of these new technologies were facing many challenges: a small domestic market, few incentives to invest in high technology, poor communication with the venture capital market, and finally, a poor university/industry interface to stimulate knowledge transfer and conversion into commercial applications.[62] Furthermore, foreign-based multinationals, which controlled a large segment of Canadian industries tended to keep their research organisations in their home country: "[a] large segment of Canadian industry is controlled by foreign-based multinationals which tend to have their principal,

[58] Miller and Smith, 865.

[59] The financial commitment of the Canadian government started later than in other countries such as Japan, who had committed itself, in 1980, to $23 million in to biotechnology R&D. The same year, West Germany budgeted $28 million for biotechnology as the first year of a five year plan. The U.K. had committed 35 million a year from 1980 to1985 in support for R&D, "in addition to an investment of $6 million per year in a jointly sponsored commercial venture between government and industry." Task Force on Biotechnology, Biotechnology: a Development Plan for Canada, 12.

[60] IRPP and SCC, eds., Biotechnology in Canada. Promises and Concerns: Proceedings of a Workshop of the IRPP and the CSC, (Ottawa: September 1980), 31

[61] Miller and Smith, 865.

[62] Office of Industrial Innovation, Technology Transfer Mechanisms in Biotechnology in the US, UK, Japan and Canada (Ottawa: Government of Canada, June 1985), 55

and usually only, research organisations in their home countries."[63] Finally, evidence of fragmentation of research and development efforts - as some provinces had already defined their own areas of priority based on specific needs and expertise, and had already started investing in the development of biotechnology - was also a reason for some scientists to ask for clear federal policy objectives. In fact, very early in the 80s, provinces like Quebec and Ontario had already started investing in different projects. For example, as early as 1981, Ontario, through Allellix, and Quebec, with Bioagral, were both investing in joint R&D public/private development programmes. And Alberta, Saskatchewan and British Colombia had already set their own research priorities.[64]

In order to secure the opportunities for Canada to exploit this "window of opportunity for industrial development," the NBAC, whose members were "dedicated to fostering biotechnology development for the benefit of Canada"[65] pleaded, in its 1984 report, in favour of more incentives for R&D in the form of financial assistance, tax incentives, more protection for intellectual property, promotion of technology transfer, and better access to foreign technology and markets.[66] In the following years, the federal government, in addition to financing programmes to encourage industrial research and transfer, answered this call for better promotion of research and development through generous tax incentives, longer patent protection (20 year period), and long-term capital loans to companies through the Canada Investment Fund.[67]

Public reactions to genetic engineering were reported to be quasi-non-existent at the time in Canada[68] and authorities in charge of reflecting on the issue seemed to be little interested or worried by public reaction. Nowhere in the reading of the situation by the Task Force, or in the one made early by the NBAC (1984), was there mention of ethical, environmental, or other concerns regarding the public acceptance of biotechnology. In 1982, the Science Council of Canada noted that ethical-scientific controversies had attracted very little attention in Canada and that Canada still had no forum where problems and promises of this new technology could be discussed.[69] Concerning the

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[63] Office of Industrial Innovation, 64.

[64] Miller and Smith, 863; William Smith, "High Technology in Canadian Agriculture," Canadian Journal of Agricultural Economics Vol.32 (July 1985): 16-17.

[65] National Biotechnology Advisory Committee, Annual report to the Ministry of State for Science and Technology (Ottawa: Minister of Supply and Services Canada, 1984), 12.

[66] National Biotechnology Advisory Committee, Annual report, 1984, 15.

[67] Standing Committee on Agriculture and Agri-Food, rBST in Canada, (Ottawa: the Committee, April 1994),10.

[68] Eddy, 23.

[69] Conseil des sciences du Canada, Le pouvoir de réglementer et son contrôle, 15 et 30.

outcome of a joint SCC/IRP workshop on the topic of biotechnology, a report from the SCC stated that:

> *"…les scientifiques, les fonctionnaires, les représentants syndicaux qui y ont participé se sont beaucoup plus intéressés aux techniques industrielles qu'aux dangers éventuels. La question des risques, mal définis mais peut-être graves, que présente cette filière technique a cédé le pas à ses autres aspects, plus prometteurs : création d'une nouvelle branche industrielle nécessitant le recrutement d'effectifs qualifiés, apport de capitaux-risques et soutien de l'État à la recherche, tous éléments d'un climat propice au développement des entreprises. »*[70]

Concerns about environmental and health hazards and worries about research that could be led by profit motives rather than by public good remained marginal.[71] Yet, this workshop was titled *Biotechnology in Canada. Promises and Concerns*. But aside from the SCC that pleaded in favour of a greater awareness of the risks, no other voice was being heard at the time to defend this point of view.

Under the impulse of the Ministry of State for Science and Technology that created the Task Force and later the NBAC, discussion focused mainly on means to secure Canada a competitive advantage in regard to this emerging technology. Subsequent reports of the NBAC (1987, 1991) continued to advocate in favour of more financial resources for growing companies but with added considerations for human resources; for regulations that took into account the cost and time required to bring a biotechnology product to market; and for public perception and market acceptance because it was becoming evident that public opinion and markets would need to be cultivated if there was to be successful marketing of biotechnology products and processes.

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[70] Ibid., 30-31

[71] H.R.S. Ryan, "A Statement of Concern for Biotechnology." Appendix C of Biotechnology in Canada. Promises and Concerns, proceedings of a workshop of the IRPP and the SCC (Ottawa: The Institute for Research on Public Policy, September 1980), 55-62.

3.2.2 France

By the end of the 1970s, France was starting to be aware of the economic and industrial stakes related to biotechnologies. But very early as well, the French government was also made aware of risks issues, ethical questions and their impact on public opinion. Between 1978 and 1980, three important reports were commissioned by the French government. In a letter dated November 28, 1978, the President of the Republic asked professors Gros, Jacob and Royer to report on the consequences of new biotechnology discoveries on society's organization and functioning, on the most useful biotechnology applications for human progress and happiness, and to suggest means to achieve these results. Acknowledging their potential consequences on society as well as on numerous industrial fields, the President expressed the wish that, relying on her own strengths, France would come to occupy a first rank.[72] Following that report, André Giraud, then Minister of Industry and already convinced that industrial applications of biotechnologies were very promising for French industry, asked Professor Royer to preside over a study group on eventual risks of biotechnologies.[73] This report which included the results of a public opinion survey, the *Rapport du groupe de réflexion sur la sécurité des applications industrielles des biotechnologies* (1981), looked at real and potential dangers, methods to prevent accidents, regulations and public opinion in France towards biotechnology in general and genetic engineering in particular. The same year, Jean-Claude Pelissolo was asked to report on the actions that had been taken so far to coordinate and promote life science research and industrial applications in France.[74]

In these reports, the government was made aware of ethical considerations pertaining to genetic engineering. Gros *et al.* warned against the loss of biological diversity, especially the genetic diversity within the human species.[75] Science having been vigorously questioned in the 1970s, these authors also warned against too great a

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[72] Valérie Giscard d'Estain, Président de la République, lettre de mission aux professeurs Gros, Jacob et Royer. 28 November 1978, in Sciences de la vie et société, rapport au Président de la République par François Gros, François Jacob et Pierre Royer (Paris, La documentation française, 1979), 3-4.

[73] André Giraud, Ministre de l'Industrie, lettre de mission à Pierre Royer, 10 juin 1980, in Rapport du groupe de réflexion sur la sécurité des applications industrielles des biotechnologies (Paris : Ministère de l'industrie, Mai 1981), 5-6.

[74] Raymond Barre, Premier ministre, lettre de mission à Monsieur Jean-Claude Pelissolo, 5 août 1980, in La biotechnologie demain ? Rapport à Monsieur le Premier ministre par Jean-Claude Pelissolo (Paris : Secrétariat d'État à la recherche, décembre 1980).

[75] Gros, Jacob et Royer, Sciences de la vie et société (Paris: La documentation française, 1979), 277.

proximity between public research and industries that could impair science's credibility. They consequently argued in favour of a science that would develop in a closer relationship with society's hopes and ethics and stressed the importance of public information and education.[76] The Groupe de réflexion (1981) was also of the opinion that the state of public opinion was already an issue: «Comme toute technologie nouvelle, la biotechnologie fascine et inquiète. Mais parce qu'elle touche aux sources mêmes de la vie, parce qu'elle recouvre un domaine très mal connu, elle suscite, plus que d'autres sans doute, des réactions passionnelles de craintes et d'espoir, à la fois fortes et ambiguës. »[77]

In its 1981 report, Pelissolo considered that it was not too early to start evaluating the impact of these technologies on society and on the French "mode de vie": What would be the incidence on French agriculture? What kind of food could we expect from biotechnology in the future? How could biotechnology be used to promote more equity between rich and poor countries? What were the acceptable limits of genetic manipulations on human cells? Pelissolo added that a reflection on the impacts should come together with efforts to inform the public in order to avoid "blocages" that would inevitably come with a poorly understood technological change.[78] The importance of public confidence in the technology was reaffirmed in subsequent reports and the importance of information, education and public debate was reassessed as lessons were drawn from public contestation of nuclear energy in France.

Despite these concerns, the development of new biotechnologies in France was encouraged. Gros *et al.* were of the opinion that society had changed. Fatalism had turned into demands for quality health care, comfort and security. In this process, health had become a right. In this context, biotechnology was seen as a possible answer to improving living conditions in France and abroad.[79] It was thought that biotechnologies would have a prime importance for three pillars of the French economy: health, agri-food, and agriculture, providing thereby a solid argument in favour of support for the promotion of biotechnology.[80]

De Rosnay, in its annexe to Gros et al.'s report, sees many ways in which biotechnology could be beneficial: « Au plan national, en résumant les principales

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[76] Gros, Jacob et Royer, 280.

[77] Pierre Royer, Rapport du Groupe de réflexion sur la sécurité des applications industrielles des biotechnologies (Paris : Ministère de l'industrie, Mai 1981), 71

[78] Jean-Claude Pelissolo, La biotechnologie demain? Rapport au Premier ministre. (Paris: Secrétariat d'État à la recherche, décembre 1980), 46.

[79] Gros, Jacob et Royer, 272-273.

[80] Sautier, Les biotechnologies, (Paris : La documentation française, avril 1988), 11.

retombées, on peut estimer que les biotechnologies et la bio-industrie contribueront à la création d'emplois, à des économies d'énergie pour certains secteurs tels que l'industrie alimentaire par exemple. La bio-industrie nous permettra de réduire notre dépendance sur le soja, sur les importations de protéines venant de l'étranger, ainsi que notre dépendance énergétique pour la production d'engrais azotés aujourd'hui très coûteuse en énergie. »[81] In agriculture, he believed that biotechnology would allow for significant land and energy savings and that these innovations could also benefit developing countries.

Pellisolo was of the opinion that there were more reasons to be optimistic than pessimistic when it comes to biotechnology. According to him, "the biotech *rendez-vous* should not be missed". He saw genetic engineering as a key technology of strategic importance for French industry and believed that biotechnologies could bring novel solutions to three of society's main challenges: health, nutrition and energy.[82] To play safe could mean being left behind in the innovation race and not being able to catch up. He also believed that the demand for these technologies lay with transformation processes that would use renewable resources and less energy.[83] To create wealth, fight pollution, save natural resources, earn more independence with respect to energy sources and help developing countries were, in sum, the many ways in which these authors expected France to benefit from the development of biotechnology in the future.

In 1981, the *Comité d'orientation du développement des industries à caractère stratégique* (CODIS)[84] nominated biotechnology as one of France's seven priorities for industry.[85] And under the impulse of the reports described above, France, in 1981, selected biotechnology as one the two highest priorities of the *Programme mobilisateur* created by the *Loi d'orientation et de programmation de la recherche du 15 juillet 1982.* This program was a comprehensive one to support accelerated R&D development and an association between public and industrial research.[86] It was replaced, in 1986, by the *Programme national "biotechnologies."* In the agri-food sector more specifically, the

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[81] De Rosnay, Joël, « Biotechnologies et bio-industries, » annexe au rapport des professeurs Gros, Jacob et Royer, Sciences de la vie et société, 142-143.

[82] Pelissolo, 9

[83] Ibid., 9 et 18

[84] Interministerial consultative body.

[85] Pelissolo, 39.

[86] This program pursued 4 main objectives: the development of the main disciplines related to biotechnology, support for industries, the study of socio-economic impacts of biotechnologies, and the creation of interfaces between disciplines and with the industry. In Daniel Chevalier. Les applications des biotechnologies à l'agriculture et à l'industrie agro-alimentaire, rapport de l'Office parlementaire d'évaluation des choix scientifiques et technologiques (Paris: Économica, 1991), 37

1985 *Aliment 2000* program was designed "to generate co-operative industry/university research" in six theme areas related to fermentation and food transformation: wine production, enzymes, lactic bacteria, mixed culture research, and tools of control of fermentation processes.[87] Finally, in 1986/87, research on seeds technology was supported with the help of European collaboration, principally through EUREKA; more fundamental aspects of agricultural biotechnology were supported by the Commission of the European Communities through the Biomolecular Engineering Programme (BEP) and the Biotechnology Action Programme (BAP).[88] Throughout the 80s, the French ministries of Agriculture and of Research and Technology also financed national research programs in addition to the work that was done in public research institutes such as the CNRS, INSERM, INRA, CEA, ORSTOM and *Institut Pasteur*.[89] Total spending on new biotechnologies for these public research institutes was evaluated globally to have risen from 578MF in 1982 to 945,6MF in 1985. Spending in new biotechnology at INRA during this same period was evaluated to have gone from 187,7MF in 1982 to 246,4MF in 1985.[90]

In short, France was among the countries that actively promoted the development of biotechnology, encouraging the establishment of co-operation centres between industries and academic institutions. But France also had to face many challenges. According to the *Groupe de reflexion*, in 1981, genetic engineering was not at all present in the French biology industry.[91] In 1981, Pelissolo reported that the French industry was not very much active with biotechnologies and that France, already behind the US and Japan, was falling behind other European countries such as Germany, Holland and perhaps even the UK. It was difficult for industries to understand all the potential of biotechnology; and decision-making was difficult because of unreliable economic forecasts and the importance of required investments. Furthermore, industry leaders seldom had the necessary technological knowledge that would enable them to make a decision. Communication with scientists was thus difficult.[92] According to Gros, Jacob and Royer, there was both a lack of scientists-entrepreneurs and of entrepreneurs-scientists.[93] Furthermore, at the beginning of the 1980s, research in France suffered, according to de Rosnay, from three main weaknesses: little attention was given to this

[87] OECD, Biotechnology and the Changing Role of Government (Paris: OECD, 1988), 30.
[88] OECD, Biotechnology and the Changing Role of Government, 31.
[89] François Gros, L'ingénierie du vivant (Paris : Éditions Odile Jacob, 1990), 175.
[90] Sautier, 97.
[91] Royer, 29.
[92] Pelissolo, 32.
[93] Gros, Jacob et Royer, 95.

technology within the French research community; there was little or no transfer of fundamental research to applied research, and thus toward industry; and French scientists seldom asked for legal protection of their results. [94]

3.3 Biotechnology and the farm sector

The emergence of biotechnology as a promising tool for commercial applications occurred, according to Bush, "at a time of major restructuring of the farm sector […] and increased industrialisation of food production."[95] Such was the case of France and Canada. It also coincided with the search for new ways to further increase farm productivity. Biotechnology, seen as the new wave of agricultural innovations after the levelling of the impact of petro-chemical intensive technologies, was considered a crucial element of future competitiveness of the sector.[96] Furthermore, there were reasons to believe that rising concerns about environmental impacts of modern farming techniques also stimulated developments in this area. Rosnay argued that the environmental crisis, the energy crisis, as well as issues raised by consumers for better, safer and cheaper products were motivations for the agri-food industry to explore biological processes in order to find solutions more respectful of the environment.[97]

3.3.1 Canada

In Canada, the emergence of biotechnology took place at a time of significant changes of Canadian agricultural policies. 1977 had marked a transition in agricultural policies with the announcement by the ministries of Agriculture and of Corporate and Consumer Affairs of a joint Canadian Agri-Food Strategy.[98] The Agricultural policy,

[94] de Rosnay, « Biotechnologies et bio-industries, » 93.

[95] Bush, Plants, Power and Profits, 23.

[96] William Smith, "High Technology in Canadian Agriculture: A Science Council Perspective," Canadian Journal of Agricultural Economics 32, (July 1985): 14-23; J.H.G. Stephens, « Biotechnology in Canada,» Agrologist 19, no.3, (1981): 8.

[97] de Rosnay, «Biotechnologies et bio-industries,» 100.

[98] David Berthelet, "Évolution des politiques et des dépenses à Agriculture Canada de 1868 à 1983," L'Économie Agricole au Canada 19, no.1 (1985): 13-14.

which had so far focused mainly on farms, would be replaced by a broader and more encompassing agri-food policy with the objective of expanding production and the capacity for exports. The 1981 Agriculture Canada's new agri-food strategy wanted to see the agri-food sector fully contribute to economic growth and development of the country. Although only some of the initiatives of this five-year strategy received the necessary financing, this strategy provided, among other things, for a widening of market possibilities, protection and improvement of productive resources, and the intensification of research and technology transfer.[99]

But Canada started its involvement in biotechnology later than other countries - and later than France, at a time of budgetary restraints that had decreased support for research over nearly a decade. According to Smith, Canada emerged out of the 1970s without any coherent technological policy for agriculture.[100] Agriculture and Agri-Food Canada, the leading agency in agricultural research and development had "endured" budgetary cuts and no corporate R&D commitment was there to compensate. However, the relevance and the emergency of promoting biotechnology in agriculture seemed to be widely recognised by the Science Council of Canada as well as by the Canadian Agricultural Research Council.[101] At this time, biotechnology was seen as a way to increase significantly the return on investment of agricultural research, an argument in favour of more financing of research in this field. [102] Biotechnologies were expected to speed up the creation of new plant varieties and to open the door to improvements that classical methods would not allow. Genetic engineering was expected to produce new plant varieties with the ability to fix nitrogen, or to be stress or disease tolerant. It was also expected to help produce more energy efficient animals. In sum, biotechnology was seen as a means to answer many of agriculture's challenges by lowering production costs, lowering costs related to environmental factors such as drought, salt or frost, and expanding land use choices.[103]

Contrary to France, Canada had no internationally competitive seed industry. It was the public sector research institutes that had been doing crop variety developments to meet the needs of Canadian farmers and the Canadian Seed Trade Association (SeCan)

[99] Berthelet, 14.

[100] Smith, "High Technology in Canadian Agriculture." 15.

[101] Canadian Agricultural Research Council, Biotechnology Research and Development for Canada's Agriculture and Food System, (Ottawa: The Council, April 1983); Smith, "High Technology in Canadian Agriculture"; Stephens, "Biotechnology in Canada."

[102] Smith, 18.

[103] Conseil des sciences du Canada, Germes d'avenir : les biotechnologies et le secteur primaire canadien, (Ottawa : Conseil des sciences du Canada, 1985), 26; Smith, "High Technology," 22.

was in charge of passing the new varieties to farmers. With no one Canadian-owned internationally competitive seed company, it was important for Canada that seeds were being developed for the specificities of its climatic conditions in order not to lose its competitiveness in the international marketplace. The National Biotechnology Advisory Committee was of the opinion that "It [would be important to recognize that it will be essential to the long-term national interests of Canada to undertake a significant amount of biotechnology research in agriculture to maintain an internationally competitive agricultural base."[104] According to this committee, public research would be essential in the case of high-volume, low unit-price crops such as barley, oat and other grains crop and in the case of low-volume specialty crops used by Canadian farmers. Research to increase the efficiency of feed utilization by cattle and hogs was also seen as a promising avenue for Canadian farmers. In the domain of food technologies, many small and medium sized companies were relying on "access to public sector and university laboratories to meet their research and technology needs".[105]

3.3.2 France

In 1980, France also came to the conclusion that it was no longer possible to consider agricultural policy alone. The French government wanted its agri-food industries to become more productive and competitive on export markets. To achieve this goal, it was decided that farmers had to be brought closer to the needs and expectations of the agri-food industry and that the sector as a whole had to be in closer contact with consumers' changing tastes. As a result the *Loi d'orientation agricole de 1980* signalled an intention to work towards a greater inclusion of agri-food industries and consumers in the orientation of the agricultural policy. It created a new co-ordinating body, the *Conseil supérieur d'orientation de l'économie agricole et alimentaire,* where representatives of the agro-industries and of consumers' defence groups were for the first time invited to participate in the definition of orientations in the agriculture and agri-food sector. This intention to be more attentive to consumer's needs and expectations was, however, not expressed in Canada where decisions concerning the orientation of the agricultural policy

[104] National Biotechnology Advisory Committee, National Biotechnology Strategy: Capturing Competitive Advantage for Canada, Fifth Report (Ottawa: Industry Canada, 1991), "Sector Opportunities", strategis.ic.gc.ca/SSG/bo01310e.html (accessed July 1999).

[105] National Biotechnology Advisory Committee, National Biotechnology Strategy, "Sector Opportunities",

were mostly made behind closed doors in close consultation with farmers associations and unions and agri-businesses.

In France, agriculture was seen as a promising sector for the development of biotechnologies, especially genetic engineering. It was identified in the Pelissolo report as one of seven sectors most likely to be profoundly transformed by biotechnologies.[106] In particular, INRA, given its important implication in varietal improvement research and food transformation[107] and the French seed industry given the importance of industries such as Limagrains, were considered winning assets for the development of biotechnology. It was believed that those countries that would develop the more competitive varieties would be competitively advantaged and well positioned for seed exportation. « Les enjeux sont à l'évidence tels que la mise en œuvre coordonnée des moyens publics et privés doit être considérée comme une nécessité mobilisant aussi bien l'agriculture que les industries amont. »[108]

With France being the second market worldwide for seeds, authorities were concerned to preserve and expand the domestic market for domestic enterprises.[109] Nitrogen fixation and the seed industry (variety improvement using genetic manipulations and in vitro multiplication) were identified as priorities. In the agri-food sector, increased valorization of industries' by-products and fermentation industries were also targeted. Pelissolo, as the CSC did in Canada, believed that biotechnologies would allow land and energy savings by the farm industry. But he also believed that this evolution could also be advantageous for developing countries, a topic that was absent at the time from Canadian preoccupations.[110]

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[106] Pelissolo,14.

[107] Biotechnologies became a major part of INRA's research activities, with two out of four priority programs related to the topic : « Application des biotechnologies à l'amélioration génétique des espèces animals et végétales" et "Biologie et génétique des micro-organismes appliqués aux transformations de la matière organique. » Chevalier, 39.

[108] Sautier, 60.

[109] Pelissolo, 15; Sautier, 58.

[110] Pelissolo, 142-143.

3.4 Conclusion

The early development of genetic engineering was marked by reflection based on conjectured risks of a new technology. But this reflection on possible risks and on precautions necessary to protect the environment and human health was short-lived as conditions of internationalization of the issue and the very nature of the technology gave rise to the emergence of a climate of competitiveness and even secrecy within the scientific community and between countries. Most industrialized countries soon became eager to capture the promises of economic development if not simply worried to be left behind in the innovation race. It was believed that those who did not "jump in" would be left behind.

As most scientifically developed countries, France and Canada were quick to consider genetic engineering as a strategic component of future economic growth. At a time of economic turmoil, they were convinced it would become determinant for the competitiveness of many industrial sectors and, because of the promises it carried, they were aware that every other scientifically and industrially developed country was likely to engage in this race for innovation. Because biotechnology research was risky and expensive to finance, it was rapidly widely recognised that the public sector needed to get involved. Both countries consequently worked to design strategies for research and industrial development that would allow them to reap the benefits of this new technology. The period that followed was characterised by the adoption, in France as well as in Canada, of measures to bring together research (mostly public at the time) and industry. With their own strengths and weaknesses, they both attempted to position themselves in order to reap the benefits of this new technology.

In the 1970s, when new biotechnologies were confined to research labs, discourse was also confined to research milieus and to authorities dealing with research institutions. In Canada, as in France, the population was not or perhaps little aware of the issue. Safety measures within research facilities, their elaboration and their implementation were at the time mostly the business of the public administration and of the scientific community. After many years of incident-free research and no obvious ecological problems, the scientific community became confident that the benefits of genetic engineering would surpass the risks, control measures were relaxed, the polemic faded for a while, and energies were soon mostly concentrated on research and development.

Elements of the discourse, in the early 1980s, mostly and generally emerged as a consequence of governments' approaches to their need for information. Although the policy communities in France and in Canada were apparently of similar composition (scientists, public officials and industries), the openness of the process really shaped the

way various risks were to be introduced into the discourse. In France, studies were commissioned from different personalities (scientists, public officials or industrials) who had the latitude to consult with whomever they saw fit and who were explicitly asked to look at different aspects of the issue, including, in some cases, ethical and risks issues. These studies were made public and, because they were commissioned to different people every time, they contributed to enlarge the circle of informed individuals and, eventually, to enlarge the policy community itself. In Canada, this period was characterised by a general avoidance of grappling with socio-ethical issues as well as environmental and health risks issues. A special committee - the NBAC - was formed to advise the government on proper ways to promote and encourage biotechnology industrial application and innovation. It is very understandable, then, that information provided by the NBAC focused mainly on economic stakes since scientists, industry representatives, and public officials sitting on the committee were expressly asked to reflect on this issue. But this official source of advice to the government, reporting to the MOSST and later to IC and in close contact with the Interministerial Committee on Biotechnology soon came to dominate discourse. I demonstrate in later chapters that these differences in the early discourse between Canada and France created different pathways to considering regulation strategies as the technology matured.

Through different measures to encourage industrial development, messages sent by both the French and the Canadian governments at the time were to the effect that new biotechnologies were of strategic importance for industrial development and to the country's long term prosperity; and that new biotechnologies could make important contributions to increase human well-being and offer solutions to environmental problems. This message was however delivered with greater efficiency in Canada because these measures came with the adoption of a policy, the National Biotechnology Strategy, the creation of the National Biotechnology Secretariat whose role was also to coordinate actions, and the creation of an advisory committee, the NBAC. With this vertical policy arrangement, the Canadian government successfully transcended the horizontal nature of biotechnology, and centralized the coordination of the policy with Industry Canada which was the department in charge. In France, new biotechnologies were also identified as a priority for the government, but policy measures to support this development were frequently introduced inside of existing programmes, giving it less visibility and emphasis. Furthermore, no special coordinating structure was created.

Even though both countries had the intention to support and encourage the development of new biotechnologies, both countries had to juggle with different political and institutional factors that led them to choose different arrangements to support the commercial development of the technology. As well, differences in the type of information and information sources used by governments in France and Canada had a

significant impact on the choices that were made. But it is most likely that these political, institutional and informational differences also brought them along significantly different regulatory paths. The next chapter gives an account of the evolution of the regulatory framework in France and Canada during this early phase of the development of new biotechnologies.

CHAPTER FOUR

Adjusting the Regulatory Framework (1980-1994)

Parallel to efforts made to support and encourage biotechnology development, France and Canada had to start thinking about regulatory changes that would enable them to respond to this new challenge. As will be shown, although both countries started off with similar industrial and economical goals, they ended up following significantly different regulatory paths. Canada chose no particular regulations without any recognition of the specificity of new biotechnologies and France chose GMO-specific regulations and clear recognition of the novel aspect of genetic engineering. In so doing, Canada was sending the message that genetic engineering and GMOs were to be dealt with as ordinary business and that the risks they involved did not warrant any special considerations. In contrast, France was acknowledging that risks were a possibility and that GMOs should be treated with special caution. At the same time, both governments were actively participating in discourse building.

4.1 Canada

In Canada, the adjustment of the regulatory framework was marked very early by a great concern to create a favourable climate for investment in biotechnology and industrial development. In its 1981 report, the Task Force on Biotechnology expressed its concern that regulatory irritants might discourage biotechnology R & D investments in Canada.

> *"For the future development of biotechnology in Canada, it may be necessary to enact, modify or eliminate certain regulations or legislation which, if not addressed, will leave Canada at a serious disadvantage relative to the rest of*

> *the world with respect to industrial investment in and exploitation of biotechnology."*[1]

The 1983 National Biotechnology Strategy (NBS) also very early set the tone: "Biotechnology is an important emerging technology area highly relevant to Canada's industrial development and natural resource economy."[2] The objective of the strategy was thus to provide guidance and support to make commercial progress. The NBAC was created by the NBS in support of this objective.

Some adjustments of the regulatory framework were suggested to reach this goal. The NBAC was of the opinion that, in order to exploit the "window of opportunity for industrial development," intellectual property had to be protected to encourage R & D investments in biotechnology. [3] Section 41 of the Patent Act was targeted. The Patent Act was accused of having had a negative effect in the past on the health care product industry in Canada by discouraging investments in pharmaceutical research and development. It was assumed that it would have the same impact on biotechnology if not removed or relaxed.

It was also believed that patentability criteria needed to be clarified. The adoption of Bill C-32, the Plant Breeders Rights giving plant breeders and developers control over the multiplication and sale of reproductive material was encouraged because it was thought that it could stimulate investments in plant breeding.[4] At the time, it was also believed in other circles that the ratification of the Convention for the Protection of New Varieties of Plants would encourage research and increase the number of varieties available to Canadian farmers.[5] With the convention ratified, seeds in Canada would go from public goods to commercial goods, a transformation that some Canadian farmers were worried about. Through the years, this concern for intellectual property issues – including a better harmonization with what was done internationally - was a constant for

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[1] Task Force on Biotechnology, Biotechnology: a Development Plan for Canada, report to the Minister of State for Science and Technology (Ottawa: The Task Force, 1981), 39; National Biotechnology Advisory Committee, Annual Report, report to the Minister of State for Science and Technology (Ottawa: Ministry of Supply and Services. 1984), 32.

[2] National Biotechnology Advisory Committee, Annual Report, 1984, 10-12.

[3] Ibid., 15.

[4] Task Force on Biotechnology, 39; National Biotechnology Advisory Committee, Annual Report, (1984), 18.

[5] Conseil des sciences du Canada, Germes d'avenir. Les biotechnologies et le secteur primaire canadien, Rapport 38 (Ottawa : le Conseil, septembre 1985).

the NBAC that was supporting the argument that these measures would reduce uncertainty for Canadian companies and increase their competitiveness.

Concerns about the appropriateness of existing regulations and legislation to ensure health and environmental safety of biotechnology products and processes became apparent later in the debate, in the mid 1980s. At the time, biotechnology products and processes were no longer confined to laboratories; rather, they were already being used in larger amount by industries and were almost ready for trials in the environment. That was when some federal departments, including Environment Canada and the MOSST, started reflecting on whether it was necessary to regulate the transit of these products from laboratories to the commercial sphere.

This interest for the regulation of biotechnology in the mid 1980s also coincided with the elaboration of the Canadian Environmental Protection Act, an *Act respecting the protection of the environment and of human life and health.* Bill C-74 was tabled to Parliament December 18, 1986. It proposed to give the federal government the power to regulate the manufacture and sale of new substances in Canada. It was the "first omnibus federal environmental statute," repealing and replacing a number of pre-existing statutes such as the Environment Contaminant Act, the Clean Air Act or the Canada Water Act. [6] CEPA however carried on and was somewhat locked into those former Acts logic, a logic of control of toxic substances through notification processes.

The Canadian Environmental Protection Act was assented to on 28 June, 1988. It introduced the first federal legal definition of the term "biotechnology": "the application of science and engineering in the direct or indirect use of living organisms or parts or products of living organisms in their natural of modified forms".[7] Although previous reports on biotechnology development identified the most recent advances such as genetic engineering, enzyme systems, fused-cell technology and plant-cell culture as being the "basis" of what was considered to be "biotechnology"[8], this legal definition diluted the novel aspect of the term within a wide set of old and new applications.

This wide ranging definition, comprising old and new products of biotechnology, was very close to the definition adopted by the NBAC in its 1987/88 report and did little to recognize any specificity to new biotechnology products. In fact, in this report, the

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[6] D. Cameron, D. Blasioli and M. Arès, Annotated Guide to the Canadian Environmental Protection Act, (Aurora: Canada Law Book Inc., December 2005), I-1.

[7] R.S.C. 1985 C.16, 4th Supp. P.3.

[8] Task Force on Biotechnology, 2 and 10-11; National Biotechnology Advisory Committee, 1984, 10.

NBAC had even insisted on the difficulty to give a precise definition of biotechnology, an argument against any special regulatory treatment of biotechnology products[9]. The NBAC considered at the time that there was "no reason to consider these new products any more hazardous than similar products of older technologies", however adding that "novel processes may open new avenues of product contamination, and require new approaches to quality control and product safety evaluation."[10]

Aside from introducing a formal definition of biotechnology in the Canadian legislation, CEPA provisions did not give biotechnology products any special consideration. Under 1988 CEPA, "the same regulatory provisions applied to both chemical substances and harmful living organisms."[11] Biotechnology products and sub-products - live or inanimate - products of fermentation or products of genetic engineering – were to be regulated under Part II of the Act covering the broad category of "toxic substances."[12] The provisions regarding "substances new to Canada" were, however, meant to have the most direct impact on biotechnology products. Section 32(a) specified that biotechnology products could be included as a group of substances that the governor in Council had the power to regulate on the recommendations of responsible ministries. Biotechnology products could thus be regulated under subsection 25 "Substances new to Canada" that gave the minister the power to make lists of domestic and non-domestic substances which would eventually determine whether or not information would be requested and the extent of the information that would have to be submitted to the minister for toxicity assessment prior to manufacture or import of a substance in Canada.[13]

The provisions of CEPA concerning "substances new to Canada" did not, however, apply to "a substance that was manufactured or imported for a use that was

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[9] They argue that specific regulation requires precise definition and that precise definition is almost impossible to provide at the time.

[10] NBAC, The Regulation of Biotechnology (Ottawa, Supply and Services: 1987/88), 8.

[11] Cameron, Blasioli and Arès, I-6.

[12] "substance": "means any distinguishable kind of organic or inorganic matter, whether animate or inanimate…" ss3(1) Gazette of Canada, part III, vol.11 (1988), 418. "For the purpose of this Part, a substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions (a) having or that may have an immediate or long-term harmful effect on the environment; (b) constituting of that may constitute a danger to the environment on which human life depends; or (c) constituting of that may constitute a danger in Canada to human life or health." Gazette of Canada, part III, vol.11 (1988), 423.

[13] Glennis M. Lewis, In response to proposals for regulating biotechnology (Edmonton: Environmental Law Centre Society, 1988).

regulated under any other Act of Parliament that provides for notice to be given prior to the manufacture, import or sale of the substance and for an assessment of whether it is toxic."[14] CEPA was then understood to be a "safety net" for products not falling under other regulations and a "benchmark" for other Acts and Regulations such as the Seeds Act, the Pest Control Products Act or the Food and Drugs Act and their related Regulations. In sum, CEPA would only apply to products that were not currently administered under other legislation and these legislations would be submitted to an "equivalency" clause "whereby all pertinent federal legislation must comply with the notification and environmental and human health assessment requirements outlined in CEPA as it applies to an assessment of a toxic substance".[15] There was however, at the time and for a long time afterward, no guarantee that the provisions in other Acts would at least meet the requirements of the CEPA. According to Doern, the term "assessment" was not even meant to be understood as "environmental assessment"[16]. Furthermore, it was, at the time, impossible to use CEPA as a benchmark since notification requirements were still not ready.

This "blueprint law" only provided a framework for future and more specific regulations. Starting in 1985, Environment Canada and Health and Welfare Canada kept working on proposals for notification requirements.

> *"In December 1987, Environment Canada and Health and Welfare Canada sought public comment on proposed regulations for meeting the notification requirements of substances new to Canada as provided by the Canadian Environmental Protection Act (CEPA). The proposed regulations provided for a comprehensive "cradle to grave" notification regime for biotechnology products that fell under the jurisdiction of CEPA. (…) However, the regulations, as proposed, were never passed into law by Governor in Council."*[17]

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[14] *Canadian Environmental Protection Act*. Part II. Subsection 25(3).. in *Gazette of Canada Part III*. Vol.11 1988., C.22 P. 423

[15] Bruce Doern and Heather Sheehy, "The Federal Biotechnology Regulatory System: A commentary on an Institutional Work in Progress," in Biotechnology and the Consumer, ed. Knoppers and Mathios (Dordrecht: Kluwer Academic Publishers, 1998), 321.

[16] Doern and Sheehy, 321.

[17] Glennis Lewis and Howard Samoil, in Response to: Proposed Notification Regulations for Biotechnology Products Under the Canadian Environmental Protection Act (Edmonton: The Environmental Law Centre, January 1991), 1. Authors refer to Environment Canada and Health and Welfare Canada, Proposals for regulating Biotechnology: An Invitation to Comment, December 11, 1987.

Another trial attempt made in 1990, with the "Proposed Notification Regulations for Biotechnology Products under the CEPA." After many years, the "New substances Notification Regulations" was adopted in March of 1994 (SOR/94-260). It was meant to deal with chemicals and certain inanimate products of biotechnology. Notification requirements for live biotechnology products were however adopted much later, in 1997.

Long delays before the adoption of notification requirements regulations under CEPA left other departments considerable latitude to elaborate the approach of their choice. Since the mid 1980s, Agriculture and Agri-Food Canada and Health and Welfare Canada had to deal, with submissions from the industry for agricultural biotechnological products. Because most genetically modified products at the time were agricultural or pharmaceutical products, only a few fell within the immediate competence of Environment Canada.[18] Furthermore, while Environment Canada was dealing with these issues at the regulatory level and going through a lengthy consultation process, Agriculture Canada, and later Health Canada used a faster path, one that involved a lot less visibility: existing guidelines for traditional products.

As mentioned earlier in this chapter, the government had, in parallel to the elaboration of the CEPA, started a reflection on regulatory aspects of biotechnologies. Analyses of the regulatory situation were undertaken by individual federal agencies who were asked to review their capacity to deal effectively with these technological developments. The 1987 proposal for a biotechnology section under the CEPA was part of these efforts. But other reports were also published that were, this time, the initiative of private research organisations. The Commission de réforme du droit du Canada and the Canadian Environmental Law Research Foundation were also reported to have participated to this early reflection and urged the federal government to control biotechnology products before they were released in the environment.[19] Furthermore, in his 1984 report, the Science Council of Canada deplored a certain confusion of rules that increased the uncertainty concerning the environmental impact of biotechnology products. Members of the CSC argued at the time that a good regulation was essential for the commercial development of biotechnology in that it would have the dual effect of

[18] Such is the case of microorganisms used in bioremediation, mineral leaching, chemical production or waste disposal to name but a few. In Lewis and Samoil, 7.

[19] Reported by the SCC who mentioned two reports on the subject: Canadian Environmental Law Research Foundation, Biotechnology and the Environment: a Regulatory Proposal, Exposé à débattre, Toronto 1984; and S. Krimsky, Regulatory policies on biotechnology in Canada, rapport manuscrit (Ottawa, Conseil des sciences du Canada, 1984). These reports also mentioned in Eugene Ellmen. "Federal Control of Biotechnology Urged by Report." The Globe and Mail. 12 october 1984. B14.

calming down public fears and encourage companies to invest. They observed that there were still many unknowns concerning the health and environmental impact of biotechnology products. Yet, there were no rules to govern the environmental release of GM seeds for field tests and no studies had been done to evaluate the ecological impact of these seeds. They thus recommended that Agriculture Canada formulate clear rules concerning field trials of GM seeds. Similar recommendations were made in the CSC report concerning the commercial approval of pesticides made from the genetic modification of micro-organisms.[20]

In 1986, the Federal government apparently chose to ignore these reports and commissioned a private consulting firm to conduct an independent review of existing federal and provincial statutes. The Henley Report – *Coordinated Study on Government Processes in the Safety and Regulation and Modern Biotechnology* – was an inventory of existing regulatory instruments and their applicability to biotechnology and was commissioned by the Federal Interdepartmental Committee on Biotechnology. In 1987, the MOSST commissioned another report, prepared by Beak Consultants, on regulatory options for Canadian biotechnology.[21] All the while, Canada kept contributing to the OECD's work on safety and regulations through which the importance to gain public confidence through sound legislation was highlighted[22] along with the absence of scientific justifications for adopting any specific legislation regarding the use and application of r-DNA techniques:

> *« Aucun argument scientifique ne justifie l'adoption d'une législation portant spécifiquement sur la mise en œuvre des techniques de recombinaison de l'ADN et de leurs applications. Les pays Membres devraient passer en revue leurs mécanismes existants de surveillance et d'examen, afin de s'assurer que l'on peut procéder à un examen et à un contrôle appropriés en évitant toute charge inutile qui pourrait entraver les progrès techniques en ce domaine.»*[23]

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[20] Conseil des sciences du Canada, Germes d'avenir, 43-45. This report was the initiative of the CSC. Directives for research field trials were adopted by Agriculture Canada much later, in 2000.

[21] Dr. Jean Hollebone, Agriculture Canada's Activities in Biotechnology, Biotechnology: Meeting new Regulatory Challenges, in proceedings of a Workshop on Food Biotechnology (Ottawa: Agri-Food Safety and Strategies Division, 29 March 1993), 4; Beak Consultants, Regulatory Policy Options for Canadian Biotechnology, report to the Biotechnology Unit of the Ministry of State for Science and Technology, March 1987. This report was also referred to in Lewis, 1988.

[22] National Biotechnology Advisory Committee, The regulation of Biotechnology, 1987-88, 13.

[23] OCDE, Considérations de sécurité relatives à l'ADN recombiné (Paris: OCDE, 1986), 45.

Feeding on these reports, the NBAC presented policy options in its 1987/88 annual report dedicated to the subject: *The Regulation of Biotechnology: A critical issue for Canadian Research and Industrial Development*. At the time, the main federal biotechnology advisory body was of the opinion that:

> *"Canadian biotechnology developments have reached the point where products designed for use in the agriculture, forestry, fisheries and mining are ready for trials in the open environment. The development of an appropriate regulatory system which covers environmental introduction and use of such products will in large measure determine whether the commercial benefits from substantial private and public investments which have been made to date will be reaped in Canada."*[24]

Although biotechnology was not considered by the NBAC as a special category, they admitted that novel processes may justify new approaches "to quality control and product evaluation" and that there was an urgent need for an efficient and flexible regulatory system. Ten key criteria were identified as essential to achieve this. The regulatory system should: *engender public confidence; make economic sense; allow industry planning for development and commercialization; be compatible with approaches internationally; be flexible; accommodate new approaches; clarify jurisdictional responsibilities; be based upon risk assessment principles; define responsibilities for risk management; and draw on independent scientific advice*.[25]

Later, in its 1991 report entitled "National Biotechnology Business Strategy: Capturing Competitive Advantage for Canada", the NBAC urged the Canadian government to remove structural barriers and to clarify the rules: "Federal regulations are a critical determinant of the cost and time required to bring a new biotechnology product to market. Current delays and regulatory uncertainties are discouraging new research and investments in commercial facilities, driving up the costs of innovation and undermining public confidence"[26]

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[24] John R. Evans, "Chairman's Transmittal Letter and Statement," December 1988, in National Biotechnology Advisory Committee, The regulation of Biotechnology, 1987-88, 3.

[25] National Biotechnology Advisory Committee. The regulation of Biotechnology, 3, 8, 14 and 15.

[26] National Biotechnology Advisory Committee, National Biotechnology Business Strategy: Capturing Competitive advantage for Canada, executive summary of Fifth Report (Ottawa: Industry Canada, January 1991).

In 1988, an Expert Subcommittee on Regulations was established by concerned departments and asked by the Cabinet to develop a "clear, coordinated regulatory system for the products of biotechnology"[27]. But it was not until January 1993 that federal regulatory departments announced that they had agreed on principles for a more efficient regulatory framework for Canadian biotechnology. The six principles of that framework, presenting obvious similarities with the NBAC's ten criteria, clearly stating that, aside from the obligation to protect health and the environment, strong consideration would be given to harmonization with international standards, and that the control of biotechnology products would be made in accordance with national priorities in general and with a willingness to support the development of a healthy biotechnology industry in Canada. Doern justly observed that ethical questions were not directly reflected in the Canadian principles.[28] The goals of the framework were to be achieved by using existing legislation and regulatory institutions (see insert), in continuation in action and in philosophy with what was previously done informally within concerned departments.

Table 2: The Six Principles of the Canadian Biotechnology Regulatory Framework, January 1993

1. Maintains Canada's high standards for the protection of the health of workers, the general public and the environment:
2. Uses existing legislation and regulatory institutions to clarify responsibilities and avoid duplication (no new act):
3. Develops clear guidelines for evaluating products of biotechnology which are in harmony with national priorities and international standards:
4. Provides a sound scientific database on which to assess risk and evaluate products:
5. Ensures the development and enforcement of Canadian biotechnology regulations is open and consultative:
6. Contributes to prosperity and well being by fostering a favourable climate for investment, development, innovation.[29]

[27] Hollebone, 5.
[28] Doern and Sheehy, 312.
[29] Hollebone, 5.

In accordance with the principles of the framework, the Canadian government favoured the use of guidelines and directives judged to be more flexible and more easily adaptable to a rapidly evolving technology. In agriculture, this meant that new products of biotechnology continued to be regulated under traditional statutes such as the Feeds Act, the Seeds Act, the Pest Control Product Act, the Health of Animals Act, the Plant Protection Act using the same approach as 'conventionally derived products'.[30] Genetically modified organisms were simply compared to 'conventional, unmodified relatives' to determine any significant differences and hence any new potential risks.[31] New guidelines would be developed to increase harmony with international standards. This step also precluded the government's intention to marginalize the use of CEPA as an over arching regulatory tool that would impose minimum requirements on other legislations.

4.2 France

In France, the early 1980s were also marked by a discussion of the adequacy of legislation in regard to new biotechnologies, a discussion that led France, at first, to reach similar conclusions as Canada concerning the type of legislative framework needed. As will be shown, in choosing to adapt its existing legislation to the realities of the new biotechnology, France, at first, wanted to go in the direction of the 1986 OECD recommendations: a case by case approach based on scientific evaluation and no specific legislation.[32] After all, Canada and France both participated in the elaboration of this

[30] Standing Committee on Agriculture and Agri-food, Capturing the Advantage : Agricultural Biotechnology in the New Millennium, (Ottawa: The House of Commons, May 1998), 12.

[31] Familiarity is determined using five criteria: the characteristics of the organism, the introduced trait, the effects on the receiving environment, the method of application, and the interaction of the above. Hollebone, 6.

[32] OCDE, Considérations de sécurité relatives à l'ADN recombiné (Paris: OCDE, 1986). This approach was also supported in Sautier, Les biotechnologies, rapport au Premier ministre. (Paris : La documentation française, avril 1988), 120: « *Il n'est ni nécessaire ni souhaitable de développer une réglementation spécifique, il convient de rechercher une harmonisation entre les principaux pays concernés, les fondements à retenir doivent résulter d'appréciations scientifiques objectives.* » This idea was also supported in the Creyssel report dedicated to the subject (1989): « …il existe en France un "puzzle" réglementaire et normatif dont il suffit d'agencer les éléments pour obtenir un système efficace permettant, dans le respect du développement économique des biotechnologies, d'assurer une sécurité convenable pour l'homme et son environnement. » Pierre Creysel, then President of the *Groupement*

report and supported its conclusions. But the French government had also been made aware very early of the importance of ethical and social issues. Drawing lessons from the nuclear experience, early reports had made this clear as they made it clear that public opinion had to be taken into consideration in the future development of biotechnologies.

In France, the specificity of new biotechnologies was repeatedly recognized in different reports and the government was warned that these characteristics could lead to new political crises and create institutional risks. In 1981, the *Groupe de réflexion sur la sécurité des applications industrielles des biotechnologies* led by professor Royer warned the minister of Industries that biotechnologies were both a source of fascination and fear for the public because these technologies were not well known and also because it concerned the foundation of life. In order to avoid public rejection, they suggested informing the public early, whatever the difficulties.[33] Later, the Sautier report also acknowledged the special nature of this technology and the need for certain precautions to be taken.

> *« Les biotechnologies ne s'appliquent pas à la matière inerte, unipotente le plus souvent. Elles mettent en jeu la complexité du vivant, complexité déjà prodigieuse au niveau du plus simple des virus. Elles s'adressent aux relations entre des êtres vivants avec leur milieu et avec d'autres êtres vivants souvent de complexité supérieure. Dans leur finalité elles s'adressent directement à l'homme, à sa santé, à son alimentation, à son mode de vie. Il n'est donc pas surprenant qu'une découverte nécessite, avant application, une très longue période de maturation et d'approfondissement. »*[34]

As a first regulatory step, the French government chose to use specialised scientific advisory commissions (external to and independent from concerned departments) and encouraged the elaboration of *Codes de bonnes pratiques* (formal guidelines) to complete the legislative framework that already included product-specific legislation and regulations to protect workers. As shown below, the French approach contrasted with the Canadian approach in clearly recognizing, with the creation of specialised structures to evaluate risks, the special nature that these new technologies

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interministériel des produits chimiques was quoted in Daniel Chevalier. Les applications des biotechnologies à l'agriculture et à l'industrie agro-alimentaire, 69.

[33] Pierre Royer, Rapport du Groupe de réflexion sur la sécurité des applications industrielles des biotechnologies (Paris : Ministère de l'industrie, Mai 1981), 71, 83, 85.

[34] Sautier, 10.

implied and the risks they posed. Later, pressures from the ecologists at the European level and the will to create a harmonized market for biotechnology products throughout Europe also greatly determined regulatory changes made by France. It forced a legal recognition of risks related to the use of r-DNA technologies and the adoption of specific legislation. This is when France started to depart from the approach recommended by the OECD. Because France too wanted the creation of a European market, because it had started to develop its own regulatory framework and evaluation structures, and because France was known to hold an intermediate position on the subject, France ended up being influential in regulatory choices later made at the European level.

In 1981, a *Groupe de réflexion sur la sécurité des applications industrielles des biotechnologies* was invited by the Minister of industries to report on existing and potential risks in industrial applications of biotechnology and to reflect on ways to make it more secure. Part of their report examined the regulatory framework. The report concluded that existing legislation would undoubtedly need to be adapted and that further legal studies would be needed along with an examination of what was done in other countries, particularly in other European countries, before any precise suggestions were made. According to the group, any change to the existing legal framework had to respect certain principles. These should guarantee the protection of industrial secrets, improve the speed of the procedure, and make room for a relaxation of the rules as knowledge of potential dangers improves.[35] These recommendations did not depart greatly from those given to the Canadian government by the NBAC but they came more than 5 years earlier and the French recommendations were balanced by a clear concern, later expressed in a variety of studies, for socio-ethical issues and risks.

Starting in the mid-1980s, France made a series of adjustments to the existing regulatory framework including the creation of expert advisory bodies outside of the public administration, a system that contrasted with the Canadian approach. First of a series of actions was the creation, in 1983, of the *Comité consultatif national d'éthique (CCNE),* a committee composed of experts with the mission to give advice on moral issues related to research in life sciences and health. In July 1985, the 1976 *Loi sur les installations classées* was modified by decree to include new biotechnologies. In the same period, the ministry of Health chose to adapt the existing *Commissions d'Autorisation de Mise en Marché* by the addition of experts in the field of dissemination of GMOs.

[35] Royer, 88.

In 1986, a new advisory commission, the *Commission d'étude de l'utilisation de produits issus du génie biomoléculaire,* later known as the *Commission du génie biomoléculaire (CGB*), was created to advise the Minister of Agriculture about risks related to the agricultural and agri-food use of products of genetic engineering, cell fusion and "other biotechnology techniques".[36] It was initially composed of 15 members mostly from research and medicine and included some members from the concerned industries, as well as a small number of union workers and consumers. It had the mandate to give an expert opinion on demands of approval for use or marketing of new agricultural and agri-food products that would result in dissemination in the environment.[37] It defined precautions that should be taken prior to dissemination and conditions of use. Questions could be directed to the CGB from the public and private sectors at all stages of research, development or marketing of a product.[38] Although its consultation was not mandatory until the loi du 13 juillet 1992, it was reported that no developer took the risk to ignore the CGB.[39]

In 1984, to complete the regulatory framework, the *interprofession*, represented by the *Organisation Interprofessionnelle des Bioindustries* (ORGANIBIO) and the Agence française de normalisation (AFNOR), was asked by the *Groupe Interministériel des Produits Chimiques* (GIPC), dependent on the Prime Minister, and by the *Commissaire à la normalisation* of the Industry Department to work on the elaboration of formal guidelines for the confined use of genetically modified organisms. It was believed that these *Guides de Bonnes Pratiques* (GBP) would provide the flexibility necessary to adapt to a rapidly evolving technology while insuring security of the public. In 1989, 11 such GBP were already in use, targeting activities such as research and development, production, analysis and effluent treatment.[40] With the creation of these standards,

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[36] Arrêté ministériel du 4 novembre 1986 instituant la Commission d'étude de l'utilisation de produits issus du génie biomoléculaire. http://www.legifrance.gouv.fr Last accessed 6 December 2005.

[37] Chevalier, 67-68.

[38] « …elle peut être saisie, aussi bien par l'administration que par les professionnels du secteur, organismes publics ou industriels privés, à tous les stades de la recherche, du développement ou de la mise sur le marché d'un produit. » in P. Rajot, « Règles de Bonnes Pratiques et Législation,»199-200.

[39] Commissariat Général du Plan, OGM et agriculture : options pour l'action publique (Paris : La Documentation française, Septembre 2001), 48.

[40] P. Rajot, « Règles de Bonnes Pratiques et Législation,» in Risk Management in Biotechnology, proceedings of the European Forum organised by the Association pour le développement de la biotechnologie, Grenoble 24-26 avril 1989, eds. J. Defaye, H. De Roissart, and P.M. Vignais (Paris : Technique et Documentation, 1990), 200-201.

France was hoping to position itself internationally at the Organisation Internationale de Normalisation (ISO) as a reference in the field.[41]

Finally, to adjust to the increasing use of new biotechnologies within industries, in May 1989, *the Commission de classement des recombinaisons génétiques in vitro* became, by decree, the *Commission du génie génétique* (CGG). Still under the trust of the Minister in charge of research, it had the mandate to evaluate potential dangers linked to the use of genetic engineering techniques and to classify GM biological agents according to the risk they represented.[42] This commission was no longer limited to *in vitro* use of r-DNA techniques and its mission was extended to confined industrial applications. The 19 members of the CGG were nominated by the Minister in charge of Research on the basis of their expertise. Half of the members were suggested by other concerned ministers, with the Research Department having the final say.[43] Similar to the CGB, there was no legal obligation to consult the CGG but it was reported that no one tried avoiding consulting them. The regulatory apparatus described above was added to the existing legislation to protect workers and the product-specific regulations already in place.

As was shown, by the end of 1989, France had already adjusted its risks evaluation structure to deal specifically with genetic engineering products and processes. Although the appeal to specialised advisory bodies was voluntary and although it was reported being staffed mostly with scientists involved in biotechnology development, this framework seemed to be operational and pretty much keeping up with developments in the sector. With the CGB, France, was ready to face the first requests for authorisation to field test biotechnology products. The CGB started its operations in 1987 with the evaluation of 9 cases, 5 of which concerned the voluntary dissemination of transgenic plants for research purposes (tobacco, beets and potatoes).[44] With the creation of the CGB, it was claimed that France had become, in 1991, second after the US, and first

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[41] AFNOR. « Programme de normalisation dans le domaine de la biotechnologie. » Biofutur (Mai 1984): 20-21.

[42] Décret simple 89-306 du 11 mai 1989 portant création d'une commission de génie génétique. http://www.legifrance.gouv.fr/ (accessed 6 December 2005).

[43] Chevalier, 67.

[44] Alexis Roy, Les experts face au risque : le cas des plantes transgéniques (Paris: Presses Universitaires de France, 2001), 102. Chiffres tirés de Sophie Béranger, Hervé Réverbori et Eric Schoonejans. « Historique de la Commission du génie biomoléculaire » in Les plantes transgéniques en agriculture. Dix ans d'expérience de la Commission du génie biomoléculaire, sous la direction d'Axel Kahn (Paris : John Libbey Eurotext, 1996), 37-38.

among European countries in terms of the number of field trials conducted on its territory.[45]

Chevalier reported that these field experiments were blocked in Germany and in Denmark by the Green Party but that the Green party in France was more nuanced and did not want to give the impression that all biotechnology was bad or catastrophic.[46] In 1987, Biofutur reported that no significant opposition movements had emerged so far against biotechnologies in France.[47] This would contribute to the perception by industrial firms, as well as by European ecologists, that France was rather in favour of the development of biotechnology products. After all, France was the second market in importance for seeds after the US. The country was also attractive for developers at the time because of its unique evaluating structure that was decreasing the uncertainty concerning future regulations. The CGB was most certainly seen as a means to facilitate market acceptance, increase product credibility and prove the good will of the developers.

As its participation in, and acceptance of, the OECD report shows, France was concerned about market harmonization and France was sharing this preoccupation with the European Commission. The Sautier report to the president suggested that the French government was alerted that a big regulatory gap could make French biotech products unacceptable in other markets. : « *La puissance publique doit donc procéder aux adaptations de sa propre réglementation pour que celle-ci ne constitue pas un handicap à la conquête des marchés extérieurs*. »[48] The Creyssel report in 1989 also insisted on bringing the French regulatory framework as close as possible to measures recommended by the OECD and the European community. This report also recommended that GMO classification be product-based rather than process-based. GM products would thus be classified according to the level of threat they represented, not on the basis that they were genetically modified. This approach, they added, would facilitate the use of existing laws and product-based regulations. It also recommended that a distinction be made between confined and unconfined usages, and that special attention be given to informing the public.[49] But although France's ecologists were nuanced and did not condemn genetic

[45] Chevalier, 62. But to our knowledge, in 1991, Canada had most probably done more GM plant field testing than France.

[46] Ibid., 62.

[47] Sylvia Vaisman, « Les écologistes face aux biotechnologies : plus associés que contestataires. Un entretien avec Brice Lalonde,» Biofutur, Décembre 1987, 23.

[48] Sautier, Les biotechnologies, 18 et 121.

[49] Antoine Cayla, « Réglementation des biotechnologies en France : Un état des lieux,» Biofutur, 1989, 61-62, quoting Pierre Creyssel, Groupe interministériel des produits chimiques, in a rapport au

engineering as a whole, the French government soon felt the pressure coming from European ecologists that were unhappy with its voluntary-based system of scientific evaluation and insisted on a process-based approach to regulation. It was in such a context that France was soon drawn to negotiate ways to regulate more formally the use of r-DNA technologies with other European countries and the European Commission.

4.3 Europe

In 1983, the EC was deploring the lack of competitiveness of European countries and linking it to the disparity of norms and regulations across member-states which were identified as an obstacle to innovation and to the creation of a harmonized European market.[50] At the time, Europe was entering into a new phase in environmental protection with the adoption, in 1985, of the Single European Act in which a section was dedicated to environmental issues (titre VIII). According to observers, its coming into force in 1987 was the start of a real environmental policy at the European level and it became a tool to regulate biotechnology.[51]

After its participation in the elaboration of the OECD report on biotechnology regulation and following a discussion with the Biotechnology Regulation Interservices Committee (BRIC), in consultation with member states and interested chemical, pharmaceutical and agri-food firms, the European Community announced, in 1986, its intention to regulate against biotechnological risks to humans and the environment. So far, each member state had responded individually to the need to create a legal framework for new biotechnologies and this situation had created distortions of the market while being an impediment to the creation of the common market.[52] Some European countries had almost banned biotechnology activities (Denmark) while others had not yet reacted to the issue (Spain and Italy), France stood somewhere in the middle.

Premier ministre sur les règlementations susceptibles de contribuer au contrôle des biotechnologies, 7 juin 1989.

[50] Raphaël Romi, L'Europe et la protection de l'environnement, (Paris: Victoires-Éditions, 1993), 61.

[51] Biotechnology was regulated under Article 130 R, defining the objective of the European environmental policy, and article 100A, relative to the bringing together of legislative, regulatory and administrative dispositions of member states for the creation the European market. In Romi, 21.

[52] Romi, 65.

Ecologists, in favour of restricting regulations, were starting to put pressure on the European Community. They were at the root of a public controversy involving a European research project for which the first worldwide environmental release of GMO was made in France in 1987 by INRA, and was shortly followed by other releases in Germany and UK. In France, the INRA chose to ignore the newly created CGB and used its own internal evaluating committee before doing the release.[53] For Arc-en-Ciel ecologists, this episode simply highlighted the fact that, so far, no real regulation was in place concerning this type of experiment. They argued that these releases were potentially dangerous and could lead to irreversible damages to the ecosystem. They accused the European Commission of scientific arrogance and of misleading member-states into thinking that security was taken seriously at the European level.[54] This account of the situation led the group to request, by the intermediary of Benedikt Haerlin, also a member of the European parliament, a moratorium on all experiments and the decontamination of the affected lands. They also requested that environmental releases of GM bacteria be forbidden in Europe until a strict regulation was in place in all member-countries.[55]

It was thus with the start of an ecological controversy and with the intention "to assist the development of a single European market for biotechnology while at the same time ensuring high environmental protection standards" that the European Commission, and France as one of the member states, started focussing their attention on the development of an appropriate legislative framework for biotechnology. [56] Europe was at first tempted to follow the OECD recommendations of no specific legislation, but because of the pressure from the ecologist movement and the influence they had in some member countries, Europe was drawn to formulate regulatory directives specifically for genetic engineering techniques. In 1989, newly elected green European MPs pushed a project to bant GMOs.[57] The proposal of a moratorium was rejected but the influence of the ecologist movement was still very clearly felt on the outcome.

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[53] « Manipulations génétiques sur les plantes. Des bactéries au champ,» Le Monde, 9 juillet 1987, 1; Jean-Marie Boerhm, « Les Verts dénoncent un grave processus irréversible, » Le Monde, 9 juillet 1987, 10; Franck Nouchi, « Faut-il des gardes-fous? » Le Monde, 9 juillet 1987, 10.

[54] Nouchi, « Faut-il des gardes-fous? » 9 juillet 1987, 10.

[55] Boerhm, « Les Verts dénoncent un grave processus irréversible, » 9 juillet 1987, 10.

[56] J. Tachmintzis. 1989. « Legislation in Europe – EEC Directives. » in Risk Management in Biotechnology, proceedings of the European Forum, Grenoble 24-26 avril 1989, eds. J. Defaye, H. De Roissart, and P.M. Vignais (Paris : Technique et Documentation, 1990), 193.

[57] Philippe Kourilsky et Geneviève Viney, Le principe de précaution, rapport au Premier ministre (Paris : Éditions Odile Jacob, La documentation française, Janvier 2000), 100.

> *"Il s'en est fallu de peu qu'une foule d'amendements extrêmement contraignants viennent alourdir les directives préparées par la Commission des Communautés Européennes, tant étaient nombreuses les objections du groupe Arc-en-Ciel et de certains parlementaires socialistes de la Commission Environnement du Parlement. Certains représentants nationaux n'étaient d'ailleurs pas en reste, et proposaient des modifications presque aussi contraignantes que les propositions d'Arc-en-Ciel. »*[58]

But the opposition of the industry and the intervention of renowned scientists against "political subjectivity"[59] contributed to the adoption of an intermediate position on the part of the European parliament. The directives allowed each country a certain degree of flexibility and specificity while insuring a uniformity of norms and a process that would facilitate commercial exchanges between member states. The process-based approach of the directives, suggesting that the European Parliament considered that intrinsic dangers were linked to genetic engineering and motivated specific regulations, was a major gain on the part of the ecologists. On the other hand, the EC let go of a proposal of the Greens to impose public consultations onto member states in favour of provisions allowing each member state to decide on its own whether such consultations were appropriate (directive 90-219, art.13, directive 90-220, art.7).

To create a consensus, Europe had to take an intermediate position that satisfied the need to protect health and the environment while allowing research and some commercial applications to continue. Motivated by the need to ensure a high and equal level of environmental protection throughout the Community and by the need to avoid the creation of non-tariff barriers to trade among the Member States, the Commission of European Communities transmitted, in 1988, three proposals for a regulatory framework for biotechnology to the Council of Ministers and to the European Parliament.[60] The framework included three proposals for directives: one for the contained use of

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[58] P. Cöers, « Parlement Européen : La Voix des Ténors, » Biofutur, Juillet-août 1989, reproduced in Risk Management in Biotechnology, proceedings of the European Forum organised by the Association pour le développement de la biotechnologie, ed. J. Defaye, H. De Roissart, and P.M. Vignais (Paris : Technique et Documentation, 1990), 277.

[59] The intervention of 16 European Nobel Prize winners was critical according to Cöers, 276 and according to Millet et Vincent, in Biofutur. Also reproduced in Risk Management in Biotechnology, 272.

[60] G. Del Bino, « Legislation in Europe and EEC Guide-lines. in Risk Management in Biotechnology, proceedings of the European Forum organised by the Association pour le développement de la biotechnologie, Grenoble 24-26 avril 1989, eds. J. Defaye, H. De Roissart, and P.M. Vignais (Paris : Technique et Documentation, 1990), 191; Romi, 63-64.

genetically modified organisms (90-219), one for the deliberate release in the environment of genetically modified organisms (90/220), both adopted on 23 April 1990; and a third proposal for the protection of workers from the risks related to exposure to biological agents adopted on November 26 1990.[61] These directives gave a legal definition of the term "genetically modified organism": "an organism (biological entity capable of replication or of transferring genetic material) in which the genetic material has been altered in a way that does not occur naturally by mating and /or natural recombination".[62] This definition stated clearly how genetic engineering differs from traditional biotechnologies and insists on the "unnatural" character of genetic manipulations. The framework proposed by these directives distinguished between voluntary dissemination and confined use; and between voluntary dissemination for research and development purposes, and the marketing of GMO products. It targeted not only micro-organisms representing dangers to humans but also those representing dangers to plants and other animal life.

The French transcription into domestic law of this framework respected these distinctions. With the adoption of Directives 90/219 and 90/220, every member state had the obligation to make sure that appropriate measures were taken to protect human health and the environment. They required that every member state designate competent authorities to evaluate, control and monitor the use of GMOs. Directive 90/219 defined a notification procedure followed by a classification of the manipulations that are the object of the notification. It included a provision for the transmission of relevant information to all member states. Directive 90/220, making a distinction between the voluntary dissemination of GMOs for research and development purposes and market introduction of products containing GMOs, described two processes in which all Member States were consulted after the competent authority of one of the Member State has been notified. These processes gave every country the opportunity to express their concerns or objections and to ask for more information. In the case of voluntary dissemination for research purposes, the directive made provision for a notification procedure and the country in which the notification was made was in charge of defining confinement rules. Relevant information was also transmitted to the European Commission that informed other countries who could in turn formulate observations. The authorization for voluntary dissemination for research purposes was given by the country evaluating the risks and was not binding for other member states.

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[61] Del Bino, 191.
[62] Directive 90/220/CEE du 23 avril 1990, Art.2, ξ 1 and 2.

For market introduction of products containing GMOs, a procedure was defined in which the member state that received the demand for authorization evaluated the risks. If the risk was judged to be acceptable, the member transmitted the dossier to the Commission with its recommendation for authorisation. The Commission then notified other member states who then had 60 days to express their objections. After this delay, if unanimity could not be reached between member states, the dossier was transmitted by the Commission to an experts committee composed of representatives of the member states (Committee 21). When the Committee could not reach a decision, the decision was submitted to a majority vote at the Council of ministers. The Council could then adopt a proposal of the Commission with a majority vote but needed unanimity to reject it. If, after a 90 days period, a decision still could not be reached by the Council, the final decision concerning the placing on the market of products containing GMOs was then taken by the Commission who had to give its agreement to the original demand. This decision, once officialised by the member state that originally transmitted the dossier, was legally binding upon all member states.

The European directives were transcribed into the French law with the Loi no. 92-654 du 13 juillet 1992 relative au contrôle de l'utilisation et de la dissémination des organismes génétiquement modifiés et modifiant la loi no 76-663 du 19 juillet 1976 sur les installations classés pour la protection de l'environnement. This law specified that a GMO is an organism, cellular or not, multicellular or unicellular, whose genetic material has been modified by means other than multiplication or natural recombination. This law also institutionalized the CGG and CGB, redefined their mandate and composition, and described the evaluation process they must adopt.

The *LOI NO. 92-654* could however have created more limitations for GMOs in France. Deputy Danielle Chevalier, member of the *Office parlementatire d'évaluation des choix scientifiques et technologiques* battled for his amendment in favour of better public information and more representatives of ecologists within the CGB. This amendment found little support within the government, even on the part of the Environment ministry. It was opposed by public and private research organisations, arguing it would make the process longer and hinder the capacity of France to compete on the international scene. Axel Kahn, then president of the CGB, even wrote a letter to the editor which was published in *LE MONDE* and a petition was signed by a considerable number of scientists to protest against a regulation they found to be too rigid.[63] But in the

[63] Axel Kahn, Le Monde, 27 mai 1992. The petition was called « L'appel de Heidelberg ». As reported by Catherine Goupillon, "Les Risques de la dissémination des plantes transgéniques pour l'environnement," Courrier de l'environnement no.27, INRA, avril 1996.

end, Chevallier got the support of France Nature Environnement, of the Ministry of the Environment and of the president and director of INRA, respectively Guy Paillotin and Bernard Chevassus-Au-Louis. However, because of the opposition by industries and even scientists who presented a petition which was signed by four Nobel Prize winners, l'Appel de l'Heidelberg, the amendment was deeply re-worked. At the end, the law only provided for an information document, with no confidential information, to be made accessible to the public.[64]

With the *Loi no. 92-654*, the opinion of the CGB and of the CGG became mandatory while their advice remained non legally-binding upon the authorities. But since the opinions of the CGB were made public, the Ministry of Agriculture would put itself in a difficult position if it were to ignore them. The French Parliament became more involved with the addition of a member of the Office parlementaire d'évaluation des choix scientifiques et technologiques (OPECST) in both commissions. The CGB, previously under the aegis of the Ministry of Agriculture became the shared jurisdiction of the Departments of Agriculture and of the Environment. The ministry of Agriculture remained, however, the host of the CGB secretariat and was the one ultimately giving the authorization for environmental dissemination based on the CGB advice. The choice of the members of the CGB became, with the adoption of *Loi no. 92-654*, a shared prerogative of the Agriculture and of the Environment ministries. In addition to experts in the field, the new composition of the CGB included one member of the OPECST, a representative of an environmental defence group, one representative of a consumer defence group, one from trade unions and one from concerned professional associations. The CGB had the duty to produce an annual report that was transmitted to the Parliament.

Hermitte pointed out a few paradoxes in the French regulatory process.[65] First, only genetic engineering was regulated while other techniques like cloning were not. Second, the membership of the CGB lacked experts from very relevant fields such as ecology or weed science, while this organisation had the mandate to evaluate risks relative to dissemination of GMOs – mostly agricultural - in the environment. Christine Noiville and Pierre-Henri Gouyon were also critical of the composition of the early CGB. According to them, until its revision in1998, the CGB was mostly staffed with scientific

[64] These events reported by Catherine Goupillon, "Les Risques de la dissémination des plantes transgéniques pour l'environnement," Avril 1996.

[65] Marie-Angèle Hermitte, « Difficultés de mise en œuvre des textes et des principes.» La dissémination d'OGM, la prudence est-elle possible ? Colloque de l'association Nature, Sciences, Sociétés (NSS) Synthèse de Véronique Le Roy (1996), 25-27 mai 1994. Section 2.

personalities, molecular biologists and people involved in varietal improvement[66]. Hermite also deplored a certain divorce of the political authorities from the scientific evaluation: the CGB was divorced from decision-making and its role was consultative. Decisions were ultimately made within the Ministry of Agriculture which did not have the expertise, but was paradoxically legally responsible for decisions made in that area. Finally, no guidelines were defined concerning the level of acceptable risk whether for France or for the EU.

The CGG changed too with the Loi du 13 juillet 1992. Its mission was redefined to be more specific[67] and the evaluation process was fixed by law. It became the joint jurisdiction of the ministers in charge of the Environment and of the ministry in charge of Research which jointly nominated the 19 scientific experts of the commission. Other ministries had the prerogative to suggest members (4 members were suggested by the ministry in charge of research, 4 from the ministry in charge of the Environment, 4 from the ministry in charge of Health and 7 members were chosen by other concerned ministries (Agriculture, education, defence, Industry, etc.).) All in all, at least one third of the 19 experts had to have competence in either environment protection or public health. For evaluating uses other than education, research or development, the secretariat of the CGG was hosted by the Environment ministry. The CGG too had the duty to report on its activities and copies of the report had to be transmitted to the Parliament. With these changes to the CGG and the CGB, genetic engineering was becoming less segmented because responsibilities were increasingly shared across departments. These two advisory bodies also became more inclusive, at least in theory, of diverse social groups.

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[66] Christine Noiville et Pierre-Henri Gouyon, Annexe 2 de Le principe de précaution, par Philippe Kourilsky et Geneviève Viney (Paris : Éditions Odile Jacob, La documentation française, Janvier 2000), 316.

[67] « La commission de génie génétique est chargée d'évaluer les risques que présentent les organismes génétiquement modifiés et les procédés utilisés pour leur obtention ainsi que les dangers potentiels liés à l'utilisation de techniques de génie génétique. Elle propose les mesures de confinement souhaitables pour prévenir les risques liés à l'utilisation de ces organismes, procédés et techniques. » Loi no. 92-654 du 13 juillet 1992. Art.3.-I. Journal Officiel Numéro 163 du 16 juillet 1992. Available on Légifrance, www.legifrance.gouv.fr (accessed 30 April 2001).

4.4 Conclusion

Governments can be big players in discourse building. From a discourse theory stance, if a government chooses to take action on a certain issue, it expresses its belief that the given problem is serious enough to request government attention and sometimes scarce resources. On the other hand, if a government chooses not to intervene, it could also send a message; this time that the given problem is not important enough to require any government involvement; or that it does not have the required resources or power to react. In the case of genetic engineering, the legal definitions adopted in both countries did a lot to justify regulatory approaches. The nature of these approaches, especially in the case of high technology, also greatly contributed to determine which actors would be integrated into the policy network and, eventually, the facility with which these actors would later influence discourse.

Although France and Canada might have been, at first, inspired by the same set of recommendations from the OECD, they soon applied approaches to the regulation of new biotechnologies that were sufficiently different to have a significantly different impact on discourse. As a first step, France, like Canada, followed the OECD recommendations to use existing legislation. The difference was, however, that France quickly adjusted its regulations with the addition of expert advisory bodies external to the administration and whose mandate was risk evaluation. In doing so, the French government sent a clear message that biotechnologies indeed raised some concerns about socio-ethical, health and environmental issues since the government needed special evaluating structures to guide its decisions. In doing so, this country quite bluntly recognized the special nature of the risks that new genetic engineering represented. Furthermore, the European Directives and their transcription into the French law confirmed and formalized the message with a law specifically targeted at the issue and a legal definition of genetically modified organisms that acknowledged the "unnatural" aspect of the technology.

Canada created the NBS and the NBAC and with it recognized the special economic importance of the stakes involved in the development of these technologies. This impulse toward the realisation of industrial and economical goals was, however, not counter-balanced by equal concerns for socio-ethical, environmental, or health risk issues. In a way, it soon led to an unquestionable domination in policy-making of the issues of research and industrial development. Adjustments of the legislative framework were periodically demanded by the Task Force (1981) and later by the NBAC (1988, 1991) but justified by the risk to put Canada at a disadvantage if legislation and regulations that created obstacles to industrial development were not modified or eliminated. In its 1991 report, the NBAC seemed to be more concerned by the public perception of risks than by

health or environmental risks themselves. Indeed, "public perception of risks and benefits" was seen as important for the overall success of commercial applications of new biotechnologies in Canada. Regulatory aspects concerning the management and control of health and environmental risks related to biotechnology were also addressed but in a superficial manner, without insisting on much.

In France and in Canada, from the early 1980s to the first market introduction of agricultural GMOs, discourse was pretty much limited to the "government, industry and research" triangle. In France, however, this triangle was broken earlier with the involvement of the parliament on the occasion of the negotiation for the European directives and the French transcription of the directives in the 1992 law. At this occasion, France also started to be exposed to opposition by environmentalists but predominantly from European organisations. Yet, because the public in general was little aware of the subject, and French NGOs still little involved on the issue, discourse at the time remained mostly within the sphere of the public administration. However, with the creation of the CCNE, of the CGB, of the CGG, and to a lesser degree, of the *College d'évaluation*, France contributed to enlarge the circle of interested actors to a variety of scientists interested in risks and ethical issues, and eventually opened the door for their informed participation into political discourse. Furthermore, because their reports were made public and often echoed in the press, they also contributed to raise public awareness.

In Canada, a reflection started in 1984 with discussions mostly internal to concerned departments and a clear involvement of the NBAC. But the intentions of the government were announced much later, in 1993, in the form of a series of policy principles that were to guide the adjustment of the existing framework. Reports commissioned on the regulatory aspects were made by private firms or were the fruit of the work internal to concerned departments. Without the obligation to make these reports public and with no evident concern for socio-ethical questions, these reports were in no way meant to feed a public debate. Opinions from outside of this circle were simply ignored in decision-making. With such an approach to consultations and information, genetic engineering in Canada was still mostly remaining the business of the public administration.

In fact, it seems that there was at the time in Canada, two parallel discursive communities. One community was working at the regulatory level, on ways to adjust CEPA through the elaboration of proposals for notification requirements and the definition of an equivalency clause. This work involved open consultations that welcomed the participation of environmental groups. But it also was one of very slow progress, with redundant discussions, and one that did not have the sympathy of the government or the public administration. Environmental groups and, to some extent, the parliament, were kept busy while the real work was going on at a very technical level,

within concerned departments and in close partnership with industries. (This aspect will be developed further in chapter 6 and 9.) Before the series of regulatory adjustments that the federal government started to introduce after 1993, civil servants made their authorisation decisions by making necessary changes in existing procedures for traditional products, on a discretionary basis and with no official guidelines. This approach to regulation contributed to keep the issue of risks related to biotechnologies away from the public eye and the scrutiny of the parliament. In 1994, new biotechnologies still had no legal existence in most of the regulations under which it was supposed to be regulated but an important number of field trials had already been authorised under the authority of Agriculture Canada.

At the time, there was, in France and in Canada, little public knowledge of the issue and, consequently, little institutional risks related to its risk management. On the one hand, the Canadian approach to regulation, with no new law, no formal regulatory adjustment, the use of guidelines, and a high degree of complexity, contributed to keep the issue mostly within the close circle of interested actors and away from the scrutiny of the parliament and the civil society. This secrecy allowed government and administrative decisions to be taken without much public visibility, thus reducing the possibility that a reflexive process would come to create institutional risks. On the other hand, the French approach was influenced heavily by its experience with nuclear energy which had left the government very much aware of the importance of public opinion. It was also drawn by the raising of controversy at the European level which had guided regulatory choices towards more stringency. At the time, institutional risks were still very low but the government had been warned that the issue of GMOs could eventually lead to a political crisis.

So both countries started to prepare. Canada insisted much on the risk to be left behind in the innovation race and started preparing to counter any blockage to market introduction. In France, where the prospect of institutional risks was already felt more acutely, a more nuanced discourse was adopted that gave more space to risks, ethics and values. As will be shown, this country ended up counting on dialogue and public debate to face the mounting controversy over genetic engineering.

CHAPTER FIVE

Adjusting the Regulatory Framework: Europe and France After 1994

« Est-ce la controverse qui guide le régulateur (au point qu'il ajoute des couches successives et pas toujours cohérentes de réglementations si complexes qu'elles empêchent une vraie vision d'ensemble) ou le régulateur qui en stigmatisant une innovation parmi d'autres entretient voire génère la controverse? »[1]

5.1 General Context – Europe and France in 1994

As was described in Chapter 4, Europe and France had, in the early 1990s, decided that the confined use of GMOs and their voluntary release into the environment would be controlled under a regulatory framework based on the process, one that particularized genetic engineering as a novel technology. When they were adopted, directives 90/219 and 90/220 were described as an intermediate position that satisfied the need to protect health and the environment while allowing research and some commercial applications to continue. They were motivated by the need to ensure a high and equal level of environmental protection throughout the Community in order to dissipate growing public fears as well as by the need to avoid the creation of non-tariff barriers to trade among Member States. Most importantly, these directives were also meant to prevent hindering the development of biotechnology and Europe's capacity to compete on the international market that the absence of a unifying regulation between members of the EC and public fears might foster.[2] After all, industrialised countries were already

[1] Commissariat général au plan, « OGM et agriculture : options pour l'action publique. » (Paris : La Documentation Française, 2001), 61.

[2] Christine Noiville and Pierre-Henri Gouyon, « Principe de précaution et organismes génétiquement modifiés. Le cas du maïs transgénique, » annexe 2 de Le principe de précaution, par

engaged in a race for patents in which Europe seemed to be at a disadvantage given its research traditions.[3]

In France, the European directives were transcribed into the French law *no. 92-654 du 13 juillet 1992.* This law institutionalized the (Commission du genie génétique) CGG and (Commission du genie biomoléculaire) CGB, redefined their mandate and composition, and described the evaluation process they must adopt. The opinion of the CGB and of the CGG became mandatory on any GMO approvals. Ministerial responsibilities became more horizontal and the Ministry of the Environment saw its responsibilities increased, becoming jointly responsible for these committees along with other concerned ministries.[4]

It seems that France too was at the time motivated by the will to allow for harmonious development of biotechnologies while avoiding the possibility that irrational fears might get in the way of biotechnologies. Since 1986, the CGB had allowed trials of GM crops to be done on the French territory, more than in any other European country.[5] New biotechnologies were seen as full of promises by the authorities, promoters and most of the scientific community. But because France, in the past, had experienced strong opposition to nuclear energy, some feared obstruction for other technological innovations such as biotechnology.[6]

Philippe Kourilsky et Geneviève Viney (Paris : Éditions Odile Jacob, La documentation française, Janvier 2000), 286-287.

[3] Marie-Hélène Aubert suggested that Europe was at a disadvantage because European scientists tended to publish their results before they could get legal protection; because of the lack of cohesion between research and industry; and because of the relative tardiness with which most European countries started supporting the technology. Marie-Hélène Aubert, Les OGM : pour quoi faire? Rapport d'information sur la dissémination volontaire des OGM dans l'environnement (Paris : Les documents d'information de l'Assemblée nationale, 2000), 27.

[4] There are however reasons to think that, at first, the inclusion the ministry in charge of the environment in the circle of responsibilities was probably only symbolic. Noiville and Gouyon reported that, in the case of BT corn, the ministry of the environment was not even informed of the dossier. Noiville and Gouyon, 292.

[5] In 1994, 222 products had been studied by the CGB putting it at second rank behind the United States for the number of cases studied. Véronique LeRoy (1996) « La Dissémination d'organismes génétiquement modifiés (OGM) la prudence est-elle possible? » Actes du Colloque INRA: Dossiers de l'environnement no.12. Chapitre 3.

[6] « Il faut éviter que ne se répète pour les biotechnologies un scénario qui se développe actuellement en matière d'énergie nucléaire c'est-à-dire le blocage d'une technologie utile et nécessaire par des phénomènes de peur irraisonnée elle-même fruit de la non-information, de l'imposition autoritaire d'une technologie et du refus du débat démocratique.» Daniel Chevalier quoted in Aubert, 67.

Surprisingly, therefore, before 1996, there was little opposition to biotechnologies in France. The press review has shown that, even though the topic was more frequently covered in The French press than in the Canadian press, there was still, in France, little press interest for the issue at the time (see appendix 3). According to Joly et al., the issue was still mostly technical and was mostly covered by scientific journalists who had a natural propensity to be positive towards technological innovations. It was still dealt within a rather closed circle of well informed actors, mostly within the CGB; these included involved scientists working at developing biotechnology, public officials from the Direction générale de l'agriculture et de l'alimentation (DGAL) and private firms' representatives:[7]

> *« La première phase, des années fin 90/91 à mi 96, est une phase de travail dans la sérénité avec les professionnels habituels de l'agriculture, c'est-à-dire les Ministères de tutelle, l'INRA, les Instituts techniques, les journalistes agricoles, peu nombreux, certes, à s'intéresser à la chose mais quand même un petit nombre qui répondait à nos invitations, etc. Je pourrais presque dire, pas d'ouverture sur le monde extérieur de ce monde professionnel. Donc, un développement qui se fait stricto sensu, on pourrait presque le dire comme ça, au sein des initiés, des gens qui trempent dans le métier agricole et qui sont initiés à l'arrivée de ces nouvelles technologies en agriculture moderne.»*[8]

In 1996, Catherine Goupillon wrote that besides the federation of France Nature Environnement[9] and, to a lesser extent, Greenpeace and Ecoropa who were led by their international counterparts, associations in France were either not taking part in discussions or were very careful and nuanced, almost indifferent, in their appreciation of the subject. Greenpeace's Arnaud Apoteker[10], interviewed for Goupillon's paper declared:

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[7] Pierre-Benoit Joly et al., L'innovation controversée : Le débat public sur les OGM en France, rapport de recherche (INRA, Collectif sur les risques, la décision et l'expertise, Janvier 2000), 27-28.

[8] Excerpt from personal interview with Novartis representative (February 1999) quoted in Joly et al., L'innovation controversée, 27-28.

[9] Goupillon reported that FNE was one of the first French associations to publish an information document on the problems related to biotechnologies. In "Alerte sur les biotechnologies," Dossier du hérisson, dirigé par Pierre Delacroix, mai 92, No. 137.

[10] Greenpeace's Arnaud Apoteker will later become one of the most preeminent figures in the fight against transgenic agriculture in France.

> *« En France, malheureusement, peu d'Associations se sont intéressées aux enjeux des manipulations génétiques jusqu'à présent, laissant les décisions aux mains de l'industrie et des scientifiques biotechnologiques. Les grands enjeux de société sont restés complètement ignorés du public. »*[11]

The story of the transcription of the European directives into the French law tends to corroborate these observations. Had it not been for Daniel Chevalier's project of amendment to law *no. 92-654*, the transcription of the 1990 directives would not have gone as far to increase the transparency of the evaluation process or to increase the representativeness of the commissions. He reported to Goupillon having received little support for this amendment on the part of the ministry of the environment or the ecologists' movement. A lot of strong voices however opposed his amendment (industries, ministries and scientists including then CGB president Axel Khan), defending the argument that these changes would make the evaluation process too long, thus hindering France's capacity to compete on the international scene.

Chevalier's amendment was watered down in the end. Yet, Daniel Chevalier succeeded in requiring both commissions to report annually before the Parliament. He also succeeded in having a member of the *Office parlementaire d'évaluation des choix scientifiques et techniques* (OPECST)[12] sitting on both commissions. Chevalier's amendment also led to more encompassing membership of the CGB, now including representatives of the civil society. Information about the requests for authorization studied by the CGB would however be made public once all confidential information was removed.

Notwithstanding Chevalier's amendments, Aubert was of the opinion that the *Loi du 13 juillet 1992* did not make provisions to really include the public in decision-making. It did not provide for any direct consultation of the population. Indirect consultation was to be achieved through civil society representatives sitting on the

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[11] Catherine Goupillon, "Les Risques de la dissémination des plantes transgéniques pour l'environnement," Courrier de l'environnement no.27, INRA, Avril 1996, http://www.inra.fr/dpenv/goupic27.htm

[12] "Crée par la loi n° 83-609 du 8 juillet 1983, à la suite d'un vote unanime du Parlement, cet Office a pour mission, au terme de la loi, « d'informer le Parlement des conséquences des choix de caractère scientifique et technologique afin, notamment, d'éclairer ses décisions ». In Sénat, « Présentation de l'Office parlementaire d'évaluation des choix scientifiques et technologiques (OPECST), » accessed 26 September 2001 http://www.senat.fr/opecst/presentation.html

evaluating commissions. In her view, more than consultation, it was information sharing that was at the time expected to increase transparency of the decision process.[13]

5.1.1 The Precautionary Principle

While genetic engineering was not yet the subject of public controversy in France, Aubert reported that, at the European level, there was not, at the time, an official meeting on the topic of biotechnologies that went without fierce protests.[14] Europe was somewhat squeezed between international treaties, European law and its member-states own expectations. Europe was at the time facing the dual challenge of positioning itself internally on these questions and of finding a way to influence decisions on the international scene so that growing public fears about food safety could be taken into account internally. Europe needed some latitude and it seemed that the precautionary principle was both the question and the answer. Which legal means should be used to deal with environmental and sanitary issues when it comes to international trade? Is the precautionary approach a legitimate means to achieve safety? As might have been expected, Europe and the United states did not share the same opinion on precaution so that the legitimacy of the precautionary approach was at the heart of international quarrels for a while.

In 1994, Europe had already started to integrate the precautionary principle into European law. Directives 90-219 and 90-220 were already seen by some as the first legal application of the principle because they targeted the process, not the product. Because GMOs were the fruit of a novel technology and because their development was controversial, the European commission had authorised itself to think that they represented potential risks. Accordingly, it had submitted their development to mandatory controls from the first stages of the research to their coming in to the market. This is why, argued Noiville and Gouyon, GMOs were a rare case of the application of a pure precautionary principle.[15] In 1992, the Maastricht treaty's article 130-R-2, made this approach official by putting the precautionary principle side by side with other principles

[13] Aubert, 74-75.
[14] Ibid., 43.
[15] Noiville and Gouyon, in Philippe Kourilsky et Geneviève Viney, Le principe de précaution, 285.

already in use such as preventative action or corrective action. It did not however give the principle a definition.[16]

But in 1994, international treaties were already creating constraints for Europe to apply the principle. Neither the GATT, nor the specific accords that were attached to it, explicitly authorised States to restrict commerce of a product in cases of scientific uncertainty for precautionary reasons. Nor did it allow states to label a product which would contain GMOs on the basis of this principle or to respect consumer's right to know.[17] Besides, article 20 of the Marrakech agreement, signed in 1994, was, step by step, getting agri-food products into the general international trade agreement. It however kept a certain derogatory status for agricultural products. On the one hand, it extended the reach of the Technical Barriers to Trade agreement, making it an obligation for WTO countries to avoid using technical norms such a labelling as a means to hinder freedom of commerce.[18] On the other hand, the Sanitary and Phytosanitary (SPS) measures agreement, also part of the overall Marrakech agreement, allowed countries to block certain products for a limited time, if it was assumed that the product posed an unacceptable risk to human or animal health. For some, SPS was introducing the legal basis of the precautionary principle. It recognised that a special measure or norms, different from the international norms, could be adopted on a temporary basis when scientific facts were partial, blurred or conflictual. A State could then temporally choose to adopt sanitary or phytosanitary measures on the basis of available scientific relevant data.[19]

The SPS and TBT agreements both recognized Codex Alimentarius approved standards as references for solving commercial disputes. Codex standards were designed to protect human health and provided information to create conditions for fair trade practices. Europe was however hoping that "other legitimate factors" such as consumers' fear, animal health or other socio-economic factors could be taken into account in the

[16] Philippe Kourilsky et Geneviève Viney, Le principe de précaution, 259.

[17] Aubert, 125-126.

[18] Béatrice Marre, La sécurité alimentaire européenne à la recherche de son Autorité, rapport no. 3212, (Paris: Les documents d'information de l'Assemblée nationale, 2001), 30.

[19] Aubert, 126; Marre, 29 and 36.

preparation of these standards.[20] According to Noiville and Gouyon, the use of non scientific factors was particularly important for GMOs:

> *"Cette question des "autres facteurs légitimes" est particulièrement importante en matière d'OGM, domaine dont l'avenir au moins immédiat apparaît lié non pas seulement aux résultats des évaluations scientifiques mais aussi à des choix de société que nos pays tentent d'organiser de manière plus démocratique qu'à l'accoutumée. »*[21]

Finally, also in 1994 and as a result of the 1992 Rio Convention, Europe along with other signatory countries was starting to negotiate the Biosafety Protocol as part of the Convention on Biodiversity. This protocol was supposed to lay out the rules for circulation of GMOs between countries, putting the onus on the exporting countries. It was finally signed in Montreal in 2000. Putting the emphasis on transboundary movements, it was supposed to insure an adequate degree of protection for transport, manipulation and use of live modified organisms that could have adverse effects on biological diversity or present risks for human health.[22]

For its part, France integrated the precautionary principle with the adoption of *loi no. 95-101 du 2 février 1995 relative au renforcement de la protection de l'environnement.* Also called *loi Barnier*, this statute was adopted after long parliamentary debates about the extent to which this legislation would support the precautionary principle. At the end of examining this bill, it was decided that the precautionary principle would be a principle according to which uncertainty, given the actual state of scientific and technological knowledge, should not prevent or delay the adoption of effective and balanced measures to prevent serious or irreversible damages to the environment. The bill also stated that the measures adopted should be economically acceptable.[23] References to the seriousness of the damage or the economic feasibility of corrective measures did not however give much direction for the choice of risk

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[20] Aubert, 126-127.
[21] Noiville and Gouyon in Kourilsky and Viney, 308.
[22] Aubert, 122.
[23] Matilde Boutonnet et Anne Guégan, «Historique du principe de précaution, » annexe 1 de Le principe de précaution, par Philippe Kourilsky et Geneviève Viney (Paris : Éditions Odile Jacob, La documentation française, Janvier 2000), 262.

management tools, nor did they provide any threshold for determining whether a risk was acceptable or not.[24]

5.1.2 Food Security Crisis, Health Scares and Institutional Risks.

As the first GMOs were arriving in European ports, the BSE (mad cow) crisis was about to have a traumatic impact on both French and European authorities and farmers. According to an official of the French Ministry of Agriculture that was interviewed for this study, it was one of the worst food security crises to hit France and Europe.[25] The mad cow disease crisis gathered tremendous play in the media. According to media news and business portal Factiva, between the end of March 1996 and December of the same year, 461 articles were published on the subject in Le Monde alone![26] In these articles, scientists expressed their doubts and fears, the President himself blamed scientists for their irresponsibility, and the scientists publicly reminded the government that they were informed in due time. Later, it was the Socialist Party which blamed the President and the Prime Minister for their handling of the situation. European experts were also reported having been under external pressure. In sum, the press coverage clearly exposed a case of system failure and was the vector for institutional threats when actors involved decided to publicly blame each other.

The BSE events were, according to Bizet, a traumatic experience for European institutions and contributed to the revision of the 1990 directives.[27] In France, it created, according to Joly and collaborators, a very reactive social context. According to them, it was critical in getting the issue of food safety on the public agenda and played a role in the recognition of the consumer's right to know. Joly et al. brought attention to the fact that, when *Libération* made its front page with "*Alerte au soja fou*" in November 1996, it created a direct link in people's mind, between the mad cow events and the publicly nascent GMO issue. They were of the opinion that the way the mad cow events were understood in the public probably explained why GMOs were rejected as a whole and why the discourse about their potential benefits never really reached the public. Their

[24] Noiville and Gouyon in Kourilsky et Viney, 310.
[25] X, DGAL, Ministry of Agriculture, interview by author, Paris, France, 28 November 2001.
[26] The subject had to be mentioned in the title or in the lead or the article.
[27] Jean Bizet, Transgénique: pour des choix responsables, rapport d'information no. 97-440 (Paris: Sénat, 1997-1998).

research showed that the Mad Cow events came to serve as a frame of reference for the understanding the GMO issue in France. Just as for the Mad Cow disease scandal, GMOs came to be seen as a food security issue. Just as for mad cow, the public felt that GMOs were motivated by profits alone and one more step in the direction of more industrialisation of agriculture. After BST, GMOs were perceived as another case of scientists playing with nature, with long term risks being neglected. Finally, the mad cow events had also given the public reasons to mistrust institutions. With GMOs, this sentiment persisted and was reinforced.[28]

Furthermore, as the controversy over GMOs grew in intensity, the tainted blood scandal and the implications it had for some bureaucrats and politicians also encouraged decision makers to be more cautious. History had shown that they could, from now on, be found liable if anything was to go wrong. In France, institutional risks were then felt by civil servants at a very personal level; for some high officials, institutional risks were becoming personal risks.

> *« Mais là, on est tous à peu près dans le même bateau. Les politiques, les fonctionnaires que nous rencontrons sont comme nous, peut-être mais pire que nous, ils ont tous peur […] de leur responsabilité personnelle. Le personnel politique français, quand je dis personnel politique c'est au sens très large, y compris les hauts fonctionnaires et les fonctionnaires qui les entourent, ont été traumatisés par l'affaire du sang contaminé. Des gens qui pensaient avoir fait ce qu'ils devaient faire se sont retrouvés un jour traités par […]. Et aujourd'hui, on a un problème qui est peut-être de même nature ou peut-être pas. Et nous on a à peu près le sentiment que nos interlocuteurs que faut pas qu'on se trompe. »*[29]

In the short run, the solution for them was to share some of the responsibility by involving the population as much as possible in the decision making. As will be shown, increasing transparency of decision making, and encouraging public debate were to become part of French strategy to resolve the issue.

In Europe, public trust was also felt as a problem and eventually motivated the adoption of a series of measures that had the goal to address consumers lost confidence in political and scientific authorities. "The ongoing BSE saga, the doxine crisis, concerns

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[28] Joly et al., « L'innovation controversée, » 107-109 and 112.

[29] X, Fédération nationale des syndicats d'exploitants agricoles (FNSEA), interview by author, Paris, France, 28 November 2001.

over the use of anti-microbial feed additives and the use of growth promoting hormones in cattle, all served to undermine confidence in the ability of the public authorities to protect consumer interests."[30] It was in this context of high institutional risks that the GMO crisis had to be managed. As will be shown, in order to regain public trust, Europe and France were pressured to increase transparency of decision making, strengthen the expert capacity and, above all, they had to reassure the population about the independence of science. In so doing, Europe and France however contributed to increasing the visibility of the issue and participated in a discourse that reinforced opponents' claims that GMOs were indeed risky.

5.2 Europe Trying to Keep Pace with Emerging Biotechnology Challenges

In 1994, Europe and France were apparently ahead of Canada when it came to regulating the market introduction and environmental release of GMOs. While Canada was only in the process of adopting a vertical approach, mostly based on existing administrative structures and existing legislation, Europe had already put in place a horizontal system with the goal to coordinate the market introduction of GMOs within Member States. This process relied upon national governments to be implemented and policed. Accordingly, each member state had the responsibility to transcribe EU directives into national law, and, in so doing, of creating the necessary institutions to control the market introduction of GMOs and evaluate environmental aspects.

The EU directive 90/220 forced the member states to adopt regulations for the deliberate environmental releases of GMOs for research and development purposes as well as for market introduction. It described a process in which the European Commission was an "informed party", "co-ordinating the opinions and objections of the Member-States."[31] But in fact, these directives did not define any standards or evaluation

[30] David Byrne, Commissioner for Health and Consumer Protection, "Key Legislation Establishes new EU Food Safety Legislation," Consumer Voice, Edition 01/2002 – EFSA Special. Available on http://europa.eu.int/comm/dgs/health_consumer/newsletter/200201/01_en.htm, accessed 4 February 2002.

[31] R.N. Gent, "Genetically Modified Organisms: an Analysis of the Regulatory Framework Currently Employed within the European Union," Journal of Public Health Medecine, 21 no.3(1999): 279.

procedures for national regulatory authorities. Member states still had leverage to choose the means and methods to regulate.

In France, the CGB was confirmed as the advisory body in charge of evaluating risks of environmental release of GMOs with the loi *du 13 juillet* 1992 *relative au contrôle de l'utilisation et de la dissémination des organismes génétiquement modifiés.* The new law however modified its composition and mandate significantly and redefined the evaluation process. Also part of the regulatory arrangements were the *Conseil supérieur d'hygiène publique de France,* whose opinion was required by the CGB in case of possible public health risks*;* and the *Comité technique permanent de la selection des plantes cultivées (CTPS)* which was in charge of evaluating the technological and agronomic values of new plant varieties and whose opinion was obligatory before any new plant variety could be authorized to be commercially grown in France.

The European Union did not begin to regulate health and nutritional aspects of genetically modified organisms that were to be put on the market until 1997. The novel food regulation (258/97) changed this, imposing upon member states a notification procedure very much like the one described for environmental releases, in the case of the placing in the market of novel foods and novel food ingredients containing GMOs**.**

5.2.1 Limits and flaws of the European regulatory framework

The first market authorisations of GMOs under directive 90/220 clearly showed the limits and flaws of a procedure which was not designed for cases of frequent and profound disagreements between Member States.

For market introduction of products containing GMOs, a procedure was defined in which the member state that received the demand for authorization evaluated the risks. If the risk was judged to be acceptable, the member transmitted the dossier to the Commission with its recommendation for authorisation. The Commission then notified other member states which had 60 days to express their objections. After this delay, if unanimity could not be reached, the dossier was transmitted by the Commission, to an experts committee composed of representatives of the member states (Committee 21). In the eventuality that the Committee could not reach a decision, the decision was submitted to a majority vote at the Council of Ministers. The Council could adopt a proposal of the Commission with a majority vote but needed unanimity to reject it. If, after a delay of 90 days, a decision still could not be reached by the Council, the final decision concerning the placing in the market of products containing GMOs was then taken by the Commission which had to give its consent to the original request. This decision, once

made official by the member state that originally transmitted the dossier, was supposed to be legally binding upon all member states.

Because of frequent disagreements between member states, petitioners were *de facto* favoured by this system. In 2000, Aubert reported that the procedure had worked well only 3 times out of 18, and only for non-controversial products. Fourteen plant varieties were authorised in spite of objections from one or more member states. The Commission, she argued, was simply not in a legitimate position to impose decisions and deliver authorisations.[32] In Fact, it is fair to say that the first authorisations were forced on a certain number of member states. Because of failure to find an agreement within mediation structures, decisions were ultimately taken by the Commission which did not have the necessary expertise and whose role was not to repeatedly take positions on such technical issues.

Some countries openly opposed EC decisions on GMOs. In 1997, Austria and Luxembourg refused to respect a decision of the European Court of Justice that was to allow the importation of GM corn despite their objections on the grounds of public safety.[33] In 1998, France refused to allow authorized GM soy and canola seed varieties to be grown on its territory for environmental reasons, placing itself in contravention of the European directive.

> *« Ce faisant, la haute juridiction administrative rappelle que l'imbroglio juridique dans lequel la France et d'autres États européens se trouvent plongés est le résultat d'une construction réglementaire inapplicable - tout au moins depuis que les comités d'experts qu'elle implique ont commencé à jouer un autre rôle que celui de chambres d'enregistrement. »*[34]

Aubert observed that, since October 1998, no new dossier for the placing on the market of a GMO could find its way out of the process. This blockage lasted until 2004. The Commission was simply refusing to forward proposals for commercialization to the Council in fear that they could not reach a decision, a decision the Commission would then have to take itself and impose upon member states.[35] It had become obvious that the

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[32] Aubert, 57-58.

[33] Gent, 280.

[34] Hervé Kempf, «Les OGM englués dans le labyrinthe européen,» Le Monde 14 décembre 1998, p. 8.

[35] Aubert, 57-58.

Commission had failed in its role to harmonize the position of the member states and that the Directive 90/220 had failed to create an internal market for GMOs.

The procedure of the novel foods regulation suffered the same difficulties as did the 90/220 directive. In 2000, Aubert wrote that no GMO had so far gotten through the process.[36] Only some food ingredients that proved to be substantially equivalent to traditional ingredients[37]could have gone through the notification process without further evaluation, provided that the petitioner showed that the new food ingredient was equivalent. Regulation (258/97) also imposed upon member states the obligation to label novel foods when the new food was a GMO or when it was a product derived from a GMO and was non-equivalent to traditional products. Directive 97/35 also modified Directive 90/220 on environmental release of GMOs, imposing on the notifier an obligation to indicate the type of labelling that was planned for the product. It did not however define any labelling standards, delaying greatly its application. Labelling soon became a European battle ground for those opposing or supporting the introduction of GMOs in Europe.

In June 1999, France, along with Denmark, Greece, Italy and Luxembourg, officially asked for a more rigorous and transparent regulatory framework. That framework, they argued, should make provision for labelling, environmental surveillance and make sure that risk evaluation takes the diversity of European ecosystems into consideration. Until then, invoking the principles of prevention and precaution, these counties announced that they were to suspend all new authorizations to put on the market of GMOs.[38]

> *"Les gouvernements des États membres suivants (Danemark, France, Grèce, Italie, Luxembourg), dans le cadre de l'exercice des pouvoirs qui leur sont conférés en matières de mise en culture et de mise sur le marché d'organismes génétiquement modifiés (OGM), considérant la nécessité de mettre en œuvre un cadre plus rigoureux et plus transparent, en particulier pour l'évaluation des risques, prenant en compte la spécificité des écosystèmes européens, la surveillance et l'étiquetage, considérant la nécessité de restaurer le confiance de l'opinion publique et du marché, soulignent l'importance que la Commission présente sans délai un projet complet de réglementation garantissant un étiquetage et une traçabilité des OGM et des produits dérivés et déclarent que,*

[36] Ibid., 63.
[37] Usually ingredients containing no traces of DNA such as oil, gluten, starch or glucose.
[38] Aubert, 88.

> *dans l'attente de l'adoption de cette réglementation, en conformité avec les principes de prévention et de précaution, ils feront en sorte que les nouvelles autorisations de mise en culture et de mise sur le marché soient suspendues."*[39]

5.2.2 Europe and the "farm to fork" approach

In 1997, and largely in response to the crisis of confidence brought about by the emergence of the BSE crisis, fundamental changes were starting to be made in the organisation of the scientific advice on which European Community legislation on the safety of food was based.[40] Furthermore, the Commission was already aware of the necessity to renew Directive 90/220. In February 1998, the European Commission had put forward a proposal to modify the 1990/220 Directive with the objectives to introduce obligatory surveillance after market introduction; to limit authorisation to a period of 7 years with the possibility to renew using a simplified notification procedure; to give the Commission the possibility to consult any committee in order to take a decision; to include principles for risks evaluation within the notification procedure; to impose the consultation of scientific committees; to give public access to authorisation and scientific evaluation reports; and to reinforce the administrative procedure.[41]

In January 2000, the Commission of European Communities published its White Paper on Food Safety, introducing a set of actions envisaged to meet "The European Union needs to re-establish public confidence in its food supply, its food science, its food law, and its food controls". According to the then European commissioner for Health and Consumer Protection, David Byrne, the European food law was in "urgent need of reform" because "consumers had lost confidence largely through the cumulative effect of a number of food-related crises" and the white paper was a blueprint for establishing a

[39] Déclaration sur la suspension de nouvelles autorisations OGM des délégations danoise, française, grecque, italienne et luxembourgeoise, Conseil « environnement » des 24 et 25 juin 1999, quoted in Aubert, 88.

[40] Peter Shears, "The European Food Safety Authority Towards coherence in food safety policy and practice," British Food Journal 106, no. 4 (2004), 340.

"farm to fork" approach to regulating food security.[42] This proposal included more monitoring and surveillance as well as the creation of a European Food Safety Authority (EFSA) that could provide scientific advice and information to the European Commission and Parliament. It announced the intention of the Commission to clarify and increase the transparency of the procedure for placing novel foods on the market, Regulation 258/97, and to complete and harmonize labelling provisions.[43] Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laid down "the general principles and requirements of food law, establishing the European Food Safety Authority (EFSA)" and laid down "procedures in matters of food safety."[44] EFSA was to work in "close collaboration with national authorities and in open consultation with its stakeholders" to provide "independent scientific advice and clear communication on existing and emerging risks."[45]

> *"EFSA's role is to assess and communicate on all risks associated with the food chain. Since EFSA's advice serves to inform the policies and decisions of risk managers, a large part of EFSA's work is undertaken in response to specific requests for scientific advice. Requests for scientific assessments are received from the European Commission, the European Parliament and EU Member States. EFSA also undertakes scientific work on its own initiative, so-called self-tasking."*[46]

Scientific Committees and Panels of the European Food Security Authority were to carry out risk assessment work in their respective specialized fields. They were composed of experts in scientific risk assessment and one of them was specialized in genetically modified organisms.

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[42] David Byrne, European Food Safety and Legislation: Challenges and Future Policy, speech/02/301 (Brussels: European Food Law Conference, 25 June 2002), press release available on http:/europa.eu.int/

[43] Commission of the European Communities, White Paper on Food Safety COM(1999) 719 (Brussels: the Commission, 12 January 2000), 2.

[44] Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002, Official Journal L 031 , 01/02/2002 P. 0001 – 0024, available on http://eur-lex.europa.eu

[45] European Food Safety Authority, "About EFSA," EFSA, accessed July 2010-07-19 http://www.efsa.europa.eu/en/aboutefsa.htm

[46] European Food Safety Authority, "What we do," EFSA, accessed July 2010-07-19 http://www.efsa.europa.eu/en/aboutefsa/efsawhat.htm

Table 3. Summary of Directive 2001/18EC Implications and Procedures[47]

"Directive 2001/18/EC introduced:

- principles for environmental risk assessment (see below);
- mandatory post-market monitoring requirements, including on long-term effects associated with the interaction with other GMOs and the environment;
- mandatory information to the public;
- a requirement for Member States to ensure labelling and traceability at all stages of the placing on the market, a Community system for which is provided for by Regulation (EC) No 1830/2003 on traceability (see below);
- information to allow the identification and detection of GMOs to facilitate post-market inspection and control;
- first approvals for the release of GMOs to be limited to a maximum of ten years;
- the consultation of the Scientific Committee(s) to be obligatory;
- an obligation to consult the European Parliament on decisions to authorise the release of GMOs; and,
- the possibility for the Council of Ministers to adopt or reject a Commission proposal for authorisation of a GMO by qualified majority."

"The risk assessment methodology, reproduced in Annex II to Directive 2001/18/EC, is as follows:

- identification of any characteristics of the GMO(s) which may cause adverse effects;
- evaluation of the potential consequences of each adverse effect;
- evaluation of the likelihood of the occurrence of each identified potential adverse effect;
- estimation of the risk posed by each identified characteristic of the GMO(s);
- application of management strategies for risks resulting from the deliberate release or placing on the market of GMO(s); and,
- determination of the overall risk of the GMO(s)."

[47] From Directorate General for Health and Consumer Protection, Questions and Answers on the Regulation of GMOs in the European Union, MEMO/02/160 - REV., (Brussels: European Commission, 4 March 2003), 2. http://ec.europa.eu/dgs/health_consumer/library/press/press298_en.pdf

Efforts to renew the directives on voluntary release of GMOs reached a conclusion three years later, in 2001, with the adoption of Directive 2001/18CE that went even further than the 1998 proposals. Replacing Directive 90/220, Directive 2001/18 EC introduced principles governing risks evaluation - so that evaluation would be harmonized between countries - and a procedure for consulting and informing the public (See box for a summary of Directive 2001/18EC implications and procedure). The new directive introduced the concept of traceability for GMOs, requiring that Member States ensure traceability at all stages of the placing on the market of GMOs. It, however, did not provide for "a definition of traceability for GMOs, the objectives of traceability or a complete approach for its implementation." Provisions for labelling under Directive 2001/18 were mandatory for notifiers but did not extend to operators who subsequently placed a GMO on the market. Furthermore, the Directive did not cover the traceability and labelling of products produced from GMOs because its scope did not extend to such products."[48]

The Commission was, however, of the opinion that Europe needed to regulate further if an internal market was to be created. Labelling and traceability issues had to be tackled.

> *"Differences and overlap between national laws, regulations and administrative provisions concerning traceability of GMOs and food and feed products produced from GMOs may hinder the free movement of products, creating conditions of unequal and unfair competition."*[49]

Amending Directive 2001/18, Regulation 1829/2003 completed the regulatory framework by introducing rules for the authorization and labelling of genetically modified foods and feeds. It laid down "Community procedures for the authorisation and supervision of genetically modified food and feed" and "provisions for the labelling of

[48] Commission of the European Communities, Proposal for a Regulation of the European Parliament and of the Council concerning traceability and labelling of genetically modified organisms and traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC. COM (2001) 182 final (Brussels, July 2001), 2.

[49] Commission of the European Communities, Proposal for a Regulation, COM(2001) 182 final, 2.

genetically modified food and feed".[50] This new regulatory framework reinforced labelling dispositions. Labelling became compulsory for all GMOs and derived products of GMOs such as starch, oils or flours. Accidental contaminations (adventitious or technically unavoidable presence) should not exceed 0,9%.

Adopted the same year, Regulation 1830/2003[51], introduced traceability rules for products authorized under Directive 2001/18 or Regulations 1829/2003. "The traceability rules make it mandatory on the operators concerned, i.e. all persons who place a product on the market or receive a product placed on the market within the Community, to be able to identify their supplier and the companies to which the products have been supplied." [52] This Regulation applies, "at all stages of the placing on the market" to products consisting of, or containing, GMOs, to food produced from GMOs and to feed produced from GMOs and placed on the market in accordance with Community legislation.[53]

5.3 France –Evolution of the Regulatory Framework

The authorisation, December 20 1996, of Novartis BT corn by the European Community was the perfect example of the problems of the European directive 90/220. Novartis BT corn had first been evaluated in 1995 by the French CGB. Given the favourable opinion of this advisory body and on the recommendation of the Conseil supérieur d'hygiène de France, Novartis' application had been submitted by France to the Commission of European Communities in March 1995. Evaluation at the European level was long and difficult because opinions were divided on the impact of a marker gene to ampicipline, an antibiotic. Unanimity could not be reached between member states.

[50] Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed. (OJ L 268, 18.10.2003, p. 1)

[51] Regulation (EC) No 1830/2003 of the European Parliament and of the Council of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC.

[52] Directorate General for Communications, Questions and Answers on the Regulation of GMOs in the European Union (Bruxelles: European Commission, 8 November 2001),12. Http://Europa.Eu.Int/Comm/Food/Food/Biotechnology

[53] REGULATION (EC) No 1830/2003 EC, Official Journal of the European Union, L 268/24, 18.10.2003.

Committee 21 and the Council of the ministers of the environment could not, alternatively, reach a decision. At last, BT corn was evaluated by 3 scientific committees who concluded, in December of 1996, that it should be authorized to be grown and sold in Europe. This decision was transmitted to France in January of 1997 and, by February 4th, a decree of the Minister of Agriculture authorised BT corn to be grown and sold in France.

In the meantime, many persons in France had become uncomfortable with GMOs. Following the ESB crisis that had reached a peak the year before and in the face of unexpected media attention that the first authorisation had triggered, the French government was redefining its position. France, which had been perceived to that point as a "promoter" of GMOs because most field trials in Europe had been done on its territory, was now almost overtly hostile. The government was suddenly bending to the Greens' critiques and taking a position that had the potential to block the entry of GMOs. Philippe Vasseur, then Minister of Agriculture demanded that GMOs be labelled.[54] Soon, President Chirac publicly made the same demand.[55] These declarations were followed by a notice for labelling issued by the government on February 2nd 1997. This notice made labelling mandatory for GM foods or feeds. Yet, the notice was inapplicable because it did not define how labelling was to be done. It was, according to Bizet, infringed upon on a daily basis.[56]

The issue became openly political when, on February 12th, the Juppé government withdraw its authorisation to grow BT corn while maintaining the authorisation to sell the same product for consumption.[57] Perceived as a disavowal of the CBG's expertise, this was soon followed by the resignation of Axel Kahn, president of the CGB since its inception.[58] This overriding of the CGB, according to Joly et al., was in direct contradiction with the French tradition to hand over scientific decisions to experts and

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[54] « Philippe Vasseur étiquette le maïs transgénique, » Libération 21 décembre 1996, p.15; Vincent Noce, « Vasseur bloque le maïs transgénique,» Libération 9 janvier 1997, p.23.

[55] « Jacques Chirac a exigé, hier en conseil des ministres, qu'aucun aliment transgénique "ne soit mis sur le marché français tant que le problème de l'étiquetage n'aura pas été résolu".» in Vincent Noce. « Chirac Bloque le maïs transgénique, » Libération 16 janvier 1997, p.22; also in « Les Docteurs Folamour du marché,» éditorial, Le Monde 18 janvier 1997.

[56] Bizet, Transgénique…, section 4.

[57] Catherine Vincent, « Alain Jupé interdit la culture du maïs transgénique, » Le Monde Vendredi, 14 février 1997, p. 30.

[58] « M. Kahn, Président de la Commission du génie biomoléculaire, démissionne,» Le Monde 20 février 1997.

closely linked to the BSE and tainted blood crisis which had found high officials personally liable :

> *« La "décision Juppé" du 5 février 1997 joue également un rôle important : refusant d'autoriser la culture du maïs Bt 176, le gouvernement de l'époque prend une position contraire à celle des commissions d'experts (notamment la CGB dont le président Axel Kahn démissionne bruyamment) et se met en infraction au regard du droit communautaire. Cette intervention directe des politiques rompt avec la tradition de délégation aux experts. Elle est probablement très liée au précédent de la vache folle et au procès du sang contaminé qui implique directement de hauts responsables politiques. »* [59]

In France, elections in June 1997 brought a change in government when a coalition of the left, led by Lionel Jospin, took power. This government included Dominique Voynet, as the Minister of the Environment. As leader of the Green Party, she had previously spoken publicly in favour of labelling and had been very critical of the CGB.

The Jospin government, pressed by public opinion as well as by economic and scientific stakes, soon launched a cross-ministerial consultation to define a rule of conduct for GMOs and to rethink the decision on BT corn.[60] On November 27 1997, the decision and a political statement were presented in a press conference that was attended by no less than 4 ministers and 2 secretaries of state. [61] A public consultation was to take place in the course of 1998 and a surveillance network was to be elaborated. Genetically modified plant varieties that can cross-pollinate with native varieties such as soy or sugar beet were not going to be allowed in France, even if this meant going against a European directive. Authorisation of Novartis BT corn was, however, maintained. This decision was based, according to the government, on an appraisal made by experts of the *Comité de prévention et de précaution* (CPP). Experts of this committee, the government

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[59] Pierre-Benoit Joly et Claire Marris, « Mise sur agenda et controverses : Une approche comparée du cas des OGM en France et aux États-Unis, » Colloque Risques collectifs et situations de crise: Bilans et perspectives, Paris : CNRS, 7-8-9 février 2001, p. 6.

[60] At this point in time, the decision of the French government not to authorize BT corn on its territory was blocking the introduction of BT corn in every other European country. The French government was pressured to take a decision.

[61] Agriculture, Environment, Research and Education, European affairs, Health and "PME".

argued, came to the conclusion that BT corn did not present any risks to the environment. This position was unfortunately denied publicly by CPP experts.[62]

Fulfilling a promise made during the electoral campaign, the Jospin government voted the *Loi du 1er juillet 1998 relative à la veille sanitaire et à la surveillance des produits destinés à l'homme.* This law was to make important changes in the configuration of health and safety-related administrative and regulatory authorities in France. It led to the creation of three state administrative authorities: the *Agence française de sécurité sanitaire des aliments* (AFSSA), the *Agence française de sécurité sanitaire des produits de santé* (AFSSAPS) and the *Institut de veille sanitaire* (IVS). The AFSSA was officially created less than a year later on April 1,1999.

This new agency drew on experts in the field and came under the control of three different ministries; agriculture, consumers and health. It was in charge of coordinating food inspection activities that were previously scattered in different ministries and agencies. Its goal was to provide for effective control of food security at every step of the production chain. It also had the task to conduct research and give scientific and technical support for food security and animal health. Finally the *public health regulations* (articles L-794-1 and L-794-2) also gave AFSSA the responsibility to deliver authorisations for veterinary drugs.[63]

AFSSA was the only institution whose main mandate was to evaluate health and nutritional risks of foods and feeds. It integrated laboratory structures and expertise that were previously attached to the administrative structures it replaced. It could commission itself to do any study it judged relevant or be commissioned by any of the three ministries to which it reported or by any officially recognized consumer association. The government had the obligation to consult AFSSA for any changes to food security laws, regulations, and decrees, or for any change proposals to European regulations.[64]

When it comes to GMOs, AFSSA was in charge of evaluating food security aspects while the CGB was still in charge of environmental and public health aspects. Because of AFSSA's power to do its own research, it also played an important and active role in the debate. In December 2001 and 2002, it organised a colloquium and wrote a

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[62] « Maïs : déclaration du Comité de la prévention et de la précaution (CPP), » Le Monde 6 décembre 1997, p.8.

[63] Martin Hirsch, Déclaration de politique qualité du directeur de l'Agence française de sécurité sanitaire des aliments (Maison-Alfort : AFSSA, 1er mars 2000).

[64] AFSSA, L'Agence française de sécurité sanitaire des aliments, dépliant explicatif (Maison-Alfort : AFSSA, 2001).

report on the benefits of GMOs in foods.[65] Earlier, on the request of the *Direction générale de la de concurrence, de la consommation et de la répression des fraudes*, it had to re-examine data concerning the possible presence of traces of GM varieties in conventional seeds.[66] The notice it published made headlines although its conclusions were not alarming. Newspapers reported the accidental presence of traces of genetically modified varieties in 41 % of oil seeds, soy, and corn samples analysed. This study was used by opponents as proof that complete segregation between GM and conventional seeds was close to impossible and that precautionary measures had simply failed; the only acceptable solution was to ban GMOs.

Fulfilling its engagement to organize a public debate, the French government decided to organize a *Conférence de citoyens* (citizen's conference) as an answer to a lack in public confidence in experts and politics and in socially shared objectives concerning applications of biotechnology.[67] Inspired by the formula of consensus conference developed in Denmark, a citizens' conference was the occasion for middle ground opinions to be expressed while avoiding giving more exposure to opponent or radical voices. In so doing, the French government was hoping to stop the polarization of the debate.[68] This Conference, organised by the *Office Parlementaire d'Évaluation des Choix Scientifiques et Technologiques* (OPECST), was part of a wider consultation process (see also Chapter 8). It took place from June 20 to 22 1998 and involved a group of 14 citizens without special interests or any *a priori* judgement on the issue. The 14 citizens were selected using polling methods and on the basis of the absence of any prejudice. The goal of the conference was to contribute to inform the public debate, to inform authorities and to complement experts' opinions. The government was hoping it would

[65] OGM et alimentation : peut-on évaluer des bénéfices pour la santé? Colloque international de l'AFFSA, (Paris : Institut Pasteur, 17-18 décembre 2001); AFSSA, Évaluation des risques relatifs à la consommation de produits alimentaires composés ou issus d'organismes génétiquement modifiés, rapport (Maison-Alfort : AFSSA, janvier 2002).

[66] AFSSA, Avis de l'Agence française de sécurité sanitaire des aliments relatif à l'évaluation, en termes de santé publique, de la signification d'un signal positif à 0,2% par une sonde 35S et du risque éventuel lié à la présence de semences de maïs OGM non identifiés, au regard notamment des taux de présence observés et de la fréquence des cas. Saisine n° 2001-SA—0170, Maisons -Alfort, le 23 juillet 2001.

[67] "Devant l'ampleur de la controverse et son côté de plus en plus passionnel, le Gouvernement a annoncé qu'un grand débat public serait annoncé sur le sujet afin de mieux connaître les sentiments profonds de la population." Sénat. Conférence de citoyens. http://www.senat.fr/opecst/o980603.html; Joly, « Risques et acceptabilité."

[68] Joly et al., « L'innovation controversée, » 125.

launch the debate on a healthier basis. Here is how Senator Le Déault summarised the objective of this conference:

> *"Les conférences de consensus ne peuvent en elles-mêmes résoudre ce dilemme, l'avis de quinze citoyens ne pouvant se substituer au débat public ; elles peuvent toutefois servir à l'amorcer et à le lancer sur des* ***bases saines****. La Conférence ne remplace pas le débat public mais elle contribue à le préparer."*[69]

Prior to the conference, citizens were informed of the different aspects of the issue. They then had to prepare a list of questions and chose the experts that were to participate in the conference. Recommendations were made by the panel of citizens at the end of the conference. The press was invited to communicate the essence of the discussions, questions and controversies initiated throughout the process. To protect the group of citizens from undue pressures, the media were however not allowed to have direct contact with them.

The *Conférence des citoyens* reached some critical conclusions on the organization of the CGB and on the relevance and mandate of a bio-sciences oversight committee. The *Conférence des citoyens* judged that the composition and working methods of the CGB were not satisfactory. It recommended that it be composed of a scientific committee including all relevant disciplines and of a general committee composed of the scientific members as well as farmers, consumers and political representatives. It is apparent, in the conclusions reached by the citizen's committee, that they valued the opinion of scientists. They, however, insisted on the representation of all relevant disciplines and on the neutrality of scientists as a guarantee of their impartiality. The recommendations of the panel were in line with the precautionary principle. For example, it recommended that research on ecological risks of the dissemination of GMOs be done before allowing their use in commercial cultures. They supported measures of traceability of GMO products, the ban of marker genes, and a clarification of the liability regime in the case GMOs would cause health or environmental problems.

The conference attracted much media attention, in part, because it was a new way to do consultation in France. The conference and its conclusions were included in a parliamentary report from the OPECST published July 8, 1998. The government

[69] Office parlementaire d'évaluation des choix scientifiques et technologiques (OPECST), L'utilisation des organismes génétiquement modifiés dans l'agriculture et dans l'alimentation. Rapport 545 (97-98) (Paris : OPECST, 1998), Tome 1. http://www.senat.fr/rap/o97-5451/o97-5451.htm

announced a series of decisions at the end of July. According to Joly and collaborators, these decisions were in continuity with the November 1997 declaration but, in the short term, went against the panel of citizens' recommendations. Over the longer term, however, the government was engaging itself to reinforce monitoring and transparency. Joly et *al.* noticed that, at the time of these decisions, the government was interpreting the panel's conclusions as a confirmation of its own line of action.[70]

Other actions were taken by the French government through the 1999 *Loi d'orientation agricole*, which introduced stricter control of food and of the impact of biotechnology on the environment. Article 75 on the quality, identification, and security of products, stated that those responsible for the policy have the duty to pursue the objective of promoting the diversity of food, identification of their characteristics, and information concerning their mode of production. They also must seek to increase the quality of food by a clear segmentation of the market, to inform consumers and to satisfy their expectations. Article 91 concerning '*biovigilance*', or the monitoring of biotechnology products, was also part of the 1999 *loi d'orientation agricole*. Under this provision, any biotechnology product released in the environment or put on the market had to be monitored for the emergence of any non-intentional effects on agricultural or natural ecosystems. Under the law, anyone marketing, distributing or using these products had the duty to participate and to collaborate in this monitoring. Even citizens had the duty to report any unwanted impact. To achieve these goals, information concerning the dissemination of GMOs had to be made available at city halls across France. The French *Loi d'orientation agricole* created a "Comité de biovigilance" under the joint responsibility of the Agriculture and Environment ministers. Its membership was to include representatives of consumers and environmental protection groups along with scientific experts and representatives of professionals working in the area. Experts and professionals were to comprise only one half of the committee's membership.

In practice, however, these measures proved difficult to apply. At one point, the French government decided to stop implementing some of the public information measures because protesters were threatening to destroy GM crops. Furthermore, because at the time all authorizations for commercial crops had been suspended until a decision from the European Court of Justice, the "Comité de biovigilance" never was put to the test. In 1999, France along with other Member States announced that all new authorizations would be suspended.

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[70] Joly et al., L'innovation controversée…, 148-149.

In fact, from 1999 on, even field trials were not tolerated by French opponents to the technology. They argued that open field public research on environmental impact of GMOs was creating unacceptable risks. They also questioned the fact that public research money was used to gather data that would eventually allow private firms, often multinationals, to get their product on the market. The legitimacy of this research was questioned publicly and numerous open field research sites were destroyed. Tension built up so high that the government, in the summer of 2001, announced its intention to organise a workshop to elaborate a charter of transparency for GMOs' open field trials. Consumer associations, experts, and government officials were invited to participate.[71] But for some, the very idea of having GMOs grown in France was unacceptable. All field research should simply be destroyed to prevent any risk. Thus the workshop was boycotted by some of the most influential actors at the time: the Confédération Paysanne and Greenpeace.

Desperate to find an acceptable solution and still wanting to re-establish a dialogue with the public, the government announced that a special conference would soon take place to unravel the issue. The Ministry of Agriculture along with the Ministry of the Environment in collaboration with Research, Health and Consumers' departments commissioned four well known experts to organize a public debate on the issue. Three main questions were to be discussed: national and international stakes related to research on GMOs; social, environmental, health, economical and cultural risks and benefits of GMOs; and improvement of citizens' participation and public information. No precise recommendations were made, just the recognition that certain questions could not, at the time, find a resolution. Recommendations however tilted toward stricter and better control and renewed institutions, better public involvement, and better public information. The report concluded that very strict security standards, improved information and transparency and renewed trust in authorities evaluating risks and socio-economic implications would allow the country both to respect citizens and to pursue technological innovation.

In 2000, France was in a situation of great public concern, with intransigent opponents having a great influence on the debate. Parallels between the fight against GMOs and the fight against globalization had been successfully set. At this point, NGOs and citizens from across France had been successfully rallied together around the goal to fight a certain form of globalisation which included GMOs. Politically, being openly in favour of GMOs had become highly uncomfortable so that the voice of those in favour

[71] « Les pouvoirs publics constatent la colonisation des cultures par les OGM. - Le gouvernement veut une charte de transparence, » Le Monde 26 juillet 2001.

was rarely heard (see appendix 4 for complete press review). It took this country many years to finally put together a new legislative framework that at last allowed ending the *de facto* moratorium on GMOs. In 2001, the European Community adopted directive 2001/18 CE replacing directive 90/220 but it was not until 2007 that these started to be transcribed into French law; first with decree *N° 2007-359 DU 19 MARS 2007 RELATIF À LA PROCÉDURE DE MISE SUR LE MARCHÉ DE PRODUITS NON DESTINÉS À L'ALIMENTATION COMPOSÉS EN TOUT OU PARTIE D'ORGANISMES GÉNÉTIQUEMENT MODIFIÉS* and later with the *LOI NO. 20087-595 DU 25 JUIN 2008 RELATIVE AUX ORGANISMES GÉNÉTIQUEMENT MODIFIÉS*. The latter was also called « loi sur les OGM ».

These legislative changes followed wide consultations on the environment with a special part devoted to GMOs. The consultation was named the « Grenelle de l'environnement » in reference to an important agreement that had brought back social peace following the May '68 turmoil in France. The GMO law, voted in 2008, had the ambition to bring coherent and comprehensive changes to French law so that all aspects of GMO use were taken into consideration. Reportedly based on principles of transparency, precaution, prevention, information and responsibility, it brought changes to rural, environment and public health codes. The new law guarantees freedom of choice for consumers and producers. It also plans the creation of a high council for biotechnology – *Haut conseil des biotechnologies* (HCB) – which was to replace and integrate the responsibilities of the CBG, the CGG and the *Comité de biovigilance*. The HCB is composed of a *Comité Scientifique* (CS) and of a *Comité Économique Éthique et social* (CEES).[72] The law also describes the responsibility of those growing GMOs: obligation to inform, to protect certain high risks regions and to allow the coexistence with other forms of agriculture[73]. Growers also have a financial responsibility in case of damage to the environment. With this law, the state has the responsibility to publish information about the location and nature of GM crops being grown.[74]

5.4 Conclusion

In France as well as in Europe, the first GM plants were introduced at a time when a food security crisis and health related scares were already creating substantial pressure on institutions and expert systems. France and Europe already had to face the fact that

[72] Décret n° 2008-1273 du 5 décembre 2008 relatif au Haut Conseil des biotechnologies, JORF n°0285 du 7 décembre 2008 page texte n° 1. Original version on Legifrance.gouv.fr

[73] For example, organic growers.

[74] Sur Légifrance.gouv.fr Dossiers législatifs – loi publiée- exposé des motifs.

the public confidence in experts and regulatory authorities had been undermined so that, with the BSE crisis not yet resolved, the market introduction of GMOs was quickly associated with other food security problems and previous system failures. It was in this context of raising environmental concerns and high institutional risks that the first market introduction of GMOs had to be managed. In order to regain public trust, Europe and France were pressured to increase transparency of decision making, strengthen the expert capacity and, above all, they had to reassure the population about the independence of science. In so doing, Europe and France however contributed to increasing the visibility of the issue and participated in a discourse that reinforced opponents' claims that GMOs were indeed risky. It is also interesting to note that, in order to untie the issue, France had to address all three characteristics of modern risks as described by Beck: accountability, responsibility and limitability.

Although Europe and France wanted to show the public that they were taking things seriously and wanted to increase transparency of the process to regain public confidence, every move they made was interpreted by opponents as hesitation. Their constant readjustment and lengthy discussions at the European and international level contributed to send a message that perhaps, they lacked capacity to efficiently tackle the issue. This perception eventually opened the door for some opponents to the technology to come to occupy their place in the media as real defenders of the people's interests.

In France, the openness of the discourse made it easier for competing views to find expression in the press. The open expert structures, with inquiry power and a duty to report directly to the parliament, introduced more transparency and allowed the informed participation of a greater number. As will be shown in the next chapter, Canada did not value as much the contribution of outside experts and limited greatly the participation of experts within the public administration in the overall discourse about risks. While France encouraged and created occasions for publicly debating controversial questions, Canada preferred to avoid as much as possible the public display of contradictory opinions.

CHAPTER SIX

Adjusting the Regulatory Framework

In Canada from 1994 to 2002

After the apparent immobility of the 1980s, Canada, in the early 1990s, was entering a phase of regulatory adjustments and clarification. So far, biotechnology products in Canada had been dealt with under informal and voluntary arrangements. The many efforts to create and adopt notification regulations for biotechnology products under the new substances section of CEPA had been so far unfruitful. CEPA, the only Act which included a legal definition of biotechnology still did not control biotechnology products. Other Acts such as the Seeds Act, the Feeds Act or the Food and Drugs Act and their regulations were still unchanged and remained quiet about biotechnology products or processes.

We have to remember that in Canada, the 1980s was a fertile ground for this kind of very informal approach to be developed. There was a clear preference, on the part of the government, to define biotechnology within a broad category of processes, as an evolution and not a revolution. Accordingly, the legal definition of biotechnology introduced in the 1988 CEPA supposed continuity between old and new processes, a definition that could be easily used to justify simple informal adjustments of guidelines already in use for products made through "traditional" or "old" processes. In addition, the public was, at the time, little aware of the issue in general and of the regulatory process in particular[1]. All the while, industries and their defenders – NBAC and Industry Canada – were, on the contrary very well aware that any delays in the evaluation of a new biotechnology product could mean important commercial losses.

After supporting biotechnology research and development for many years, the federal government wanted to reap the benefits of its investments and the NBAC, the only advisory group that did have significant access to the government was pleading in favour of the establishment of flexible guidelines. This choice was also supported by Canada's interpretation of the OECD recommendations according to which there was no evidence that specific regulations were needed.

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[1] It seemed that the industry was also in need of some help to better understand the process.

From the mid 1980s, departments were faced with many demands from the industry for environmental release. To meet these demands, Agriculture and Agri-Food Canada and Health and Welfare Canada simply used their discretionary powers to adjust existing guidelines developed for non-biotechnology products: pesticides, fertilizers, seeds, foods, feeds and drugs. As will be shown, in Canada, formal regulatory adjustments were adopted much later, after many products had already received authorization for field release or market introduction; most guidelines were completed before the related regulations were amended; and, except for CEPA's Section 32(a), no legislative amendment was introduced to deal with the issue of biotechnology products. In sum, in Canada, GMOs did not bring any major legal or regulatory restructuring. The government and the public administration rather opted for a bottom-up approach where legislative and regulatory changes were used only as a last recourse.

Although no specific regulation was ready at the time, since the mid 1980s, a number of products had been authorised for trials in the open environment, mostly under the Seeds Act and Regulations. In the early 1990s, other products, such as Chimosine, an enzyme produced through biotechnology and used to make cheddar or recombinant bovine somatotropine (rBST) were about to be approved, respectively under the Food and Drug Act and Regulations[2] and under the Veterinary Drugs Act and Regulations. In 1997, before the Health of Animals Regulations had been amended to force environmental assessment of veterinary biologics, "8 veterinary vaccines and 25 diagnostic kits produced through the new techniques of biotechnology" had [already] been approved in Canada.[3]

Using existing guidelines to make minimal adjustments avoided early products of genetic engineering lengthy discussions and delays. With almost no modification to the legislative framework, it was easy to keep the debate within the closed circle of the executive and to keep it away from the parliament and political parties. Real public consultations started much later, after the essence of the regulatory framework was adopted. While, during this period, the government kept referring to its "regulatory framework", the fact was that biotechnology products were dealt with under a patchwork of voluntary measures with minimal adjustments to this new reality.

At the start of the 1990s, this informal, voluntary regime was becoming uncomfortable and difficult to justify. Many factors pushed the federal government to clarify regulatory requirements that some already called "the maze". First, as new

[2] Chimosine was approved in 1992.

[3] Government of Canada, Regulatory Impact Analysis Statement, SOR/97-6, Canada Gazette part II, vol.131, no 1(1997): 26.

products from biotechnology were about to enter the marketplace, the industry and the NBAC were asking for the adoption of arrangements that would contribute to foster public confidence in these products and reduce uncertainty for developers. Second, as other countries were starting to adopt their own regulations, Canada was aware that the failure to clarify responsibilities for biotechnology regulation could erode its credibility as a trading partner. Third, the issue was getting more exposure as new products were about to enter the Canadian marketplace (and grocery shelves) and as the public was becoming more aware and concerned about biotechnology health and safety issues. Canada was also aware of growing opposition to GMOs in Europe. Since the issue was also beginning to attract the attention of the Parliament – mostly through the cases of CEPA and the bovine growth hormone - studies by Parliamentary Committees were the occasion for environment and consumer defence groups to get more involved and vocal on the issue, criticizing existing rules, asking for more regulations and even questioning the government's will to protect the environment and public health. In particular, the interpretation of the equivalency clause in CEPA being contentious, pressures in favour of the adoption of minimal requirements for environmental assessments to be imposed on other Acts before they can be considered equivalent greatly motivated the government to clarify its framework. However, much of the adjustments that were later made had the purpose to confirm the authority of Agriculture Canada to conduct environmental assessments of agricultural products of biotechnology.

The Federal Regulatory Framework on Biotechnology, approved by Cabinet in December 1992, embraced much of these considerations (Table 2, section 4.1) but was in fact a policy statement. The six principles, designed to ensure that "the practical benefits of biotechnological products and processes were balanced against the need to protect the environment, human health and safety", were said to be the result of an agreement between federal regulatory departments.[4] The Framework, the fruit of the work of the Biotechnology Committee of the Interministerial Committee on Biotechnology, was never questioned or debated publicly before or after its approval by the government. It served both as guidance and justification for regulatory actions that were later taken, rejected or ignored. As will be shown in following sections, alternatives considered were limited by the Framework and the Framework (which was said to be good because it suggested a balanced approach) largely contributed to frame the official governmental discourse about regulatory actions and biotechnology. As will be shown, despite much critique and opposition to the regulatory approach put forward by the government, a series of regulatory adjustments in agreement with the Framework followed the

[4] Agriculture and Agri-Food Canada. "Regulatory Impact Analysis Statement." Canada Gazette PartII, vol. 129, no. 2, (1995): 210. and Canada Gazette Part II, vol. 131, no.1 (1997), 22. Also prepublished in Canada Gazette Part 1, August 17, 1996..

announcement of the principles. In sum, the Framework was in continuity, in philosophy and in fact, with the approach taken thus far and it was in essence fostering the work already in progress within departments and consisting in the elaboration of guidelines. Some of these were incidentally ready and in use well before the coming into force of amendments to their related regulations.

6.1 Regulatory context

The Federal Regulatory Framework for Biotechnology and its application have to be contextualized within a movement toward more cost efficient regulation in Canada. This movement was initiated with the Regulatory Reform Strategy of the Mulroney government in 1986 and was portrayed "as a contribution to economic growth and job creation by improving the management of government, by removing obstacles to growth and by encouraging private initiative."[5] This strategy included the nomination of a minister responsible for regulatory affairs and the first ever *Guiding Principles of Federal Regulatory Policy* based on 10 principles designed to help the government "regulate smarter".[6] Although a plan to review all regulatory statutes was announced at the time, it was not until the early 1990s that this movement took a more concrete turn. It culminated, in 1992, in an unprecedented regulatory review – both departmental and parliamentary – and the first Government of Canada Regulatory Policy (updated in 1995 and renewed in 1999).

This demonstration was in large part made by way of the obligation to make a Regulatory Impact Analysis Statement (RIAS), a process that required each federal department to submit, with the proposed draft regulation, an analysis of the expected impact of each regulatory initiative. In simple terms, RIAS was "intended to show that: government intervention was necessary; regulation was the best alternative; the proposed regulation maximized net social benefits; there was adequate consultation; and the compliance mechanism was appropriate and in place."[7] RIASes were supposed to explain the purpose and expected effects of the new regulation, alternatives considered,

[5] Deputy Prime Minister Erik Nielsen, February 13, 1986, quoted in House of Commons, "Regulations and Competitiveness " in Minutes of Proceedings and Evidence of the Sub-Committee on Regulations and Competitiveness of the Standing Committee of Finance (Ottawa : Queen's Printer for Canada, January 1993), 12.

[6] House of Commons, "Regulations and Competitiveness,"12.

[7] Treasury Board Secretariat, RIAS Writer's Guide (Ottawa: Consulting and Audit Canada, Aug.1992), 7.

and results of consultations with interested parties had to be summarized as well as department's responses to concerns raised.[8]

Although the regulatory reform included elements to strengthen the role of parliament and to improve public consultation and information mechanisms - Citizen's Code of regulatory Fairness adopted in 1988 and increased powers and resources for House of Commons' Committees - there was a clear sense that economic aspects and competitiveness were taking precedence over these issues. Firstly, responsibility for regulatory affairs was, since February 1991, put in the hands of the President of the Treasury Board of Canada who was designated as Minister responsible for Regulatory Affairs.[9] In practical terms, this meant that the Treasury Board would have responsibility for the application of the Regulatory Policy and oversee its application. Secondly, since 1993, an Economic Statement of the Minister of Finance imposed the use of a "business competitiveness test" as part of the cost-benefits analysis to all regulators "bringing forward proposals which could seriously affect business". [10] This tool was developed by the Treasury Board Secretariat working with Industry Canada and the Canadian Manufacturers' Association. Certainly, the government also recognized that cost or benefits to health, safety, or the environment were and should be taken seriously but, to this day, no equivalent tools were available for their assessment. Furthermore, an examination of RIAS prepared for biotechnology related regulatory amendments between 1995 and 1998 showed that these aspects were rarely considered in the cost-benefit analysis. This finding brought Doern to observe that cost-analysis RIAS were very partial and that they related "only to the financial costs to business and the government of the regulatory system being proposed". RIAS, he argued, did not assess products or their social costs.[11] RIASes that were examined for this research confirmed Doern's observation: they focused mostly on cost-benefit analysis for industries and government and they made little or no reference to health, environmental and social risks as justification for action. This was especially evident in the case of biotechnology–related RIAS prepared by the Department of Agriculture.

In the early 1990s, as the government was reflecting on ways to regulate biotechnology, the entire governmental apparatus was reflecting on ways to "regulate smarter" in order to preserve Canada's competitive advantage. To further the reflection, in 1992, the Committee on Finance was given, by the Minister responsible for regulatory

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[8] House of Commons, "Regulations and Competitiveness,"18.

[9] Ibid., 18.

[10] Government of Canada. Responsive Regulation in Canada. The Government Reply to Sub-Committee on Regulations and Competitiveness (Ottawa: Treasury Board Secretariat, April 1993), 9.

[11] Bruce Doern, Inside the Canadian Biotechnology Regulatory System: Closer Exploratory Look. P.6.

Affairs, the wide mission to assess "the overall impact of regulation on competitiveness".[12] This mission was followed by an important report on the topic. In the mean time, departments were asked to examine "their existing regulations through public consultations and [to publicly re-justify] their regulatory programs". This effort was completed in June 1993 and a five-year schedule of revocations and revisions was set.[13] Agriculture Canada was among the first departments asked to undergo this regulatory review. In the fall of 1992, Agriculture Canada reported that, with respect to food production and inspection and the health and safety approval process, "[t]he government will continue to regulate in the area but will give priority to measures that do not hinder competitiveness."[14]

Finally, in 1994, the federal government announced its Federal Regulatory Reform Agenda. Said to be a "key item in the government's Job and growth initiative", it identified biotechnology as one of six sectors of priority to improve regulatory efficiency in order to foster "competitiveness, job creation and growth" in these sectors of the economy.[15] It was within this context of conciliating the need to regulate with economic growth that a CEPA review was undertaken, in 1994. Environment would not escape this general trend as shows this statement from the Canadian government in response to the report of the Standing Committee on Environment and Sustainable Development which was responsible for conducting this review : *« Certes, la LCPE révisée doit constituer un mécanisme national efficace pour la protection de l'environnement, mais elle doit également aider le gouvernement à atteindre ses objectifs de croissance et de création d'emplois en reconnaissant les besoins des créateurs d'emplois au Canada - les entreprises et les industriels. »*[16]

With a clear belief that economic prosperity would, in the end, increase environmental protection and environmental quality, the government invoked the principles of sustainable development to support its orientations:

> *« Le développement durable qui reconnaît l'interdépendance des politiques économiques, sociale et environnementale a des effets profonds sur la politique gouvernementale. Dans un Canada prospère, la capacité d'assurer une bonne qualité de vie et des écosystèmes en santé s'améliore continuellement. En*

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[12] House of Commons, preface to Regulations and Competitiveness, xi.

[13] Treasury Board Secretariat, Managing Regulations in Canada. Regulatory Reform and Regulatory Programs (Ottawa: Ministry of Supply and Services, 1996), 4.

[14] House of Commons, Regulations and Competitiveness, 101.

[15] Treasury Board Secretariat, Managing Regulations in Canada, 5.

[16] Gouvernement du Canada, Examen de la LCPE : la réponse du gouvernement (Ottawa : Ministère des Approvisionnement et Services, 1995), 4.

> *outre, un Canada prospère est compétitif et attire les investissements générateurs d'emplois et de richesses. … »*[17]

It thus became evident that, with CEPA, the Canadian government was pushing the concept of sustainable development further. Not only was it trying to reconcile the economic and environmental principles of sustainable development, it was subjecting environmental goals to commercial objectives. CEPA, while promoting environmental protection, had to help Canada become more competitive by favouring new technologies and innovation. A triple objective was openly sought: environmental protection, commercial innovation and competitiveness. [18] *« La LCPE servira à promouvoir la protection de l'environnement, à favoriser les nouvelles technologies et à rendre le Canada concurrentiel dans un monde où les normes environnementales déterminent en bonne partie la compétitivité. »* [19] It is within this general regulatory context that the government of Canada first started to reflect on how to regulate biotechnology. And, as will be shown, the choices made for biotechnology were mostly in line with this general idea of "competitive regulation."

6.2 The Canadian Environmental Protection Act

CEPA review, starting in 1994, shaped the evolution of discourse about biotechnology in Canada. One of the provisions of CEPA - 1988 ordered that the relevance of the Act be evaluated within 5 years of its adoption. The Standing Committee on Environment and Sustainable Development was put in charge of this examination of CEPA's efficiency. Audits started in the spring of 1994, and after conducting 55 public audits, hearing 310 testimonies, and examining 71 briefs, the Committee tabled a report to the House of Commons in June 1995. Two recommendations concerned biotechnology specifically:

> *Recommendation 68: The Committee recommends that CEPA be amended to include a new part to deal specifically with products of biotechnology. This new Part will include minimum notice and assessment standards for all products of biotechnology released into the environment, including those regulated under other federal Acts. Other federal statutes shall prevail over CEPA in regard to the environmental impact assessment of products of biotechnology only if their*

[17] Gouvernement du Canada, Examen de la LCPE : la réponse du gouvernement, 5.
[18] Ibid., 6.
[19] Ibid., 6.

notification assessment and regulatory standards are at least equivalent to those prescribed under CEPA.

Recommendation 69: The Committee recommends that CEPA be amended to require the Governor in Council to publish a list of statutes considered to be at least equivalent to CEPA with respect to their assessment process for products of biotechnology.

In its response to the report, the government agreed with the Standing Committee that animated products of biotechnology were of a special nature and will require a special treatment within CEPA. The federal government however reaffirmed its intention, for efficiency's sake, to "avoid duplication": CEPA would serve as a safety net when products were covered by no other federal laws or regulations and, when no other laws or regulations applied (or could apply), will cease to be applied once a new law applying to the case at hand was enacted. In sum, the government had the intention to ignore the Committee's recommendations about the equivalency clause and to weaken the clause to such a level that CEPA would simply become a safety net for those products that were not and would not be covered by another legislation or regulation. The government's response contained other elements that also contributed to anger those who agreed with the Committee's recommendations: the government seemed to deny that biotechnology had any negative impact and wished to promote biotechnology as an ecological technology:

« ...Nous voulons faire en sorte que les applications de la biotechnologie constituent des volets essentiels des programmes de prévention de la pollution et de remise en état de l'environnement, ainsi que des technologies de décontamination, lorsque des dommages sont survenus.

Le gouvernement du Canada veut s'assurer qu'il existe au Canada une réglementation qui favorise l'innovation, l'investissement dans le secteur de la biotechnologie et le transfert des connaissances techniques. De plus, celle-ci devrait aider à rendre les entreprises canadiennes plus concurrentielles. Néanmoins, le gouvernement du Canada est conscient de la crainte qu'inspirent les applications de la biotechnologie. D'aucuns estiment que ces applications risquent d'avoir des effets nocifs sur l'environnement, la santé ou la vie humaine et que le gouvernement fédéral doit exercer un leadership fort et continu pour assurer une utilisation efficace et sans risque de la biotechnologie. »[20]

[20] Ibid., 57.

The government itself did not consider that biotechnology could really have lethal, negative impacts on environment or human health. The government recognized that "others" thought that biotechnology could have negative impacts but did not admit there could be reasons to worry. On the contrary, biotechnology was expected to have many positive impacts on the environment and the economy. This latter aspect was put forward and justified a regulation that was to favour innovation, investments and competitiveness. The federal government even had a plan to promote biotechnology as an "ecological" technology, a plan that was developed later within the 1998 renewed biotechnology strategy.[21]

Following the publication of this response, a period for comments allowed diverse groups to express themselves on the renewal of CEPA. Comments were published by Environment Canada. Although CEPA was covering a diversity of environmentally related subjects, many comments were on biotechnology and many interest groups were mobilized around the issue. This time, however, comments that were made went further than technical aspects of the legislation; they questioned the government's methods and intention to properly regulate biotechnology products.

A response to the government of Canada proposal, written by Mark Winfield of the Canadian Institute of Environmental Law and Policy and Brewster Kneen of the British Columbia Biotechnology Circle on the account of the Biotechnology Caucus of the Canadian Environmental Network was supported by no less than 72 different groups across the country including consumer associations, environmental defence groups, nutritionists, law associations, women's organisations, organic growers and trade unions. This was also the start of the public involvement of well known groups with a national and international scope such as Greenpeace or Friends of the Earth who were among the signatories.

The proposal of the government to weaken the equivalency clause that could impose minimum standard requirements for health and environment assessment under CEPA was at the heart of the dissent. But signatories also questioned the priorities of the government and were worried by its apparent lack of concern for possible environmental and health risks. To the argument of the government in favour of cost effective regulations, opponents replied that the government was so far able to find important sums of money to support research and innovation and that "[t]he protection of the human health, safety and the environment should be the overriding priorities in the regulation of

[21] Government of Canada, The 1998 Canadian biotechnology Strategy: An Ongoing Renewal Process (Ottawa: Industry Canada, 1998), 15. Theme 4 of the CBS work plan is about promoting the use of biotechnology for public health and safety.

biotechnology by the government of Canada".[22] This report openly questioned the motivations of the government, arguing it had been more concerned with economic growth (and foreign interests) and commercial imperatives than by environmental protection:

> *"Perhaps the most shocking aspects of the government's proposed approach, however, is the role it assigns to the regulatory system. This seems to have little or nothing to do with public health and environmental protection and everything to do with the promotion of commercial interests. It is not "Canadians" who will gain a "competitive advantage" from the approach which the government proposes; it is a limited number of business interests, a large percentage of which are subsidiaries of transnational corporations. But it is Canadians whose health and environment will be put at risk."*[23]

Furthermore, according to the Biotechnology Caucus of the Canadian Environmental Network, the double role played by Agriculture Canada as promoter and regulator of agricultural biotechnology products created a situation of conflict of interest:

> *"Beyond these legal issues, consideration must be given to the multiple roles being played by Agriculture Canada in relation to agricultural biotechnology. The Department has acted simultaneously as the lead creator, tester, promoter and regulator of agricultural biotechnology products in Canada. The conflict of interest inherent in these promotional and regulatory functions must be recognized and addressed."*[24]

Given the many concerns expressed toward the government's response and mainly because of its intention to weaken the provisions regarding biotechnology in CEPA despite the Standing Committee on Environment and Sustainable Development's recommendations, the Standing Committee decided to inquire further on the issue. In a report dedicated to the subject in June 1995, the Committee asked the government to "defer any decision on the new biotechnology part of the Canadian Environmental Protection Act (CEPA), and maintain existing provisions in CEPA regarding biotechnology, until such time as the House of Commons Standing Committee on

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[22] Mark Winfield and Brewster Kneen, "For Whose Future? A response to the Government of Canada's Proposal for the Regulation of Biotechnology under the Canadian Environmental Protection Act (CEPA)," published in Environment Canada, CEPA Review: Compilation of Comments on the Government Response (Ottawa: Environment Canada, April 9, 1996) Vol.1, 3

[23] Winfield and Kneen, "For Whose Future?" 8.

[24] Ibid., 13.

Environment and Sustainable Development has completed its present study of biotechnology, expected to occur in the fall of 1996."[25]

Further inquiry by the Standing Committee on Environment and Sustainable Development ended with the production of another report on the topic in November 1996. This latter report was based on nine public hearings and three roundtables organised around three themes: regulatory options and risk communication; ethical considerations; and biotechnology: products and processes. On the topic of regulation, many suggestions were made. It was some of the participants' view that the existing structure of responsibility distributed among many departments lacked credibility and that responsibility for regulating biotechnology should be centralized in a "Gene Law" and a "transgenic agency". This report was the occasion for some to further question the independence of the authorities in charge. The dual role of some of the agencies responsible for regulating biotechnology was again the object of attention: "the three principal regulators of biotechnology – Health Canada, Environment Canada and Agriculture and Agri-Food Canada – are also "promoters" of biotechnology, including rDNA technology."[26]

The report also openly questioned the relevance of the *Canadian Biotechnology Regulatory Framework.* It gave opponents another forum to confront the official message about its effectiveness and adequacy; and to condemn the government's refusal to explore regulatory alternatives. The independence and neutrality of the NBAC was questioned. They expressed the need for a structure that would encompass a wider range of views and interests.

Consumer associations also started to get involved on the issue. The *Fédération nationale des associations de consommateurs du Québec*, using financial support by the Consumer Office of Industry Canada,[27] conducted pan-Canadian consultations in 1995 and 1996 on regulatory needs for biotechnology in Canada. From coast to coast, citizens, consumers associations, environmental protection groups, women groups and farmer

[25] Standing Committee on Environment and Sustainable Development, The Regulation of Biotechnology, (Ottawa: the Committee, June 1996). See recommendation No. 1.

[26] Proposal of Doctor William Leiss as reported in Standing Committee on Environment and Sustainable Development, Biotechnology Regulation in Canada, (Ottawa: The Committee, November 1996), chapter 3. www.parl.gc.ca/committees352/sust/reports/03_1996-11/chap3e.html

[27] The Consumer Office of Industry Canada also financially supported the creation of a Network of Concerned Citizens in 1994. Surveys were then revealing that consumers lacked knowledge of the technology and had some concerns about its use and applications. This Network had the mandate to bring citizens and interest groups together to confront these issues in a democratic and open manner. Fédération nationale des associations de consommateurs du Québec, Le futur entre nos mains : pour un contrôle public des biotechnologies, Rapport final 1995-1996 présenté au Bureau de la consommation d'Industrie Canada. (Janvier 1997) 6-7.

groups contributed to the reflection. A report, including recommendations was published in January 1997and echoed most of the CEN report's recommendations.

The FNACQ report questioned the motivations of the government. It was argued that health and environment did not always seem to be priorities for the authorities. It drew attention to the fact that biotechnology products were entering the Canadian market without citizens being kept informed or consulted while the federal government had not yet put in place any specific regulation for these products. Fundamental questions, it was argued, were neglected in decisions about regulations but also about development and support of these technologies. Risks were not evaluated properly and authors observed that biotechnology laws and regulations did not sufficiently protect health and environment and that public participation was not encouraged. The dual role of promoter and regulator was underlined as well as the apparent unwillingness to make environment and health priorities, before the promotion of the industry. This report also implied that the government might deliberately be putting more emphasis than needed on benefits of biotechnology to create support for pro-biotechnology measures. *"Pour justifier, aux yeux du grand public, d'importantes sommes d'argent déjà investies dans les secteurs public ou privé, il nous apparaît que les promoteurs et les autorités fédérales au Canada ont pu surestimer les avantages que l'on pouvait en tirer, tant sur les plans du bien-être, de la santé, de l'environnement, que sur celui du développement socio-économique. »* [28] Finally, based on the 1994 Optima survey[29] that found that a majority of citizens wished to be informed through labelling, FNACQ asked that the public provide greater access to information, a greater access to decision making and that labelling of all biotechnology products become mandatory.

As will be shown, the federal government did not consider much of the recommendations made by interest groups or by parliamentary committees. It picked only the recommendations that fit into an already agreed upon framework. The government did not at all seem shaken by accusations of favouring economic development at the expense of environment and health safety. In fact, it chose mostly to ignore these criticisms, an attitude that may be explained by low press coverage which gave opponents little public exposure and thus little impact in public discourse. Recommendations of the parliament, wide opposition by various NGOs across Canada and the seriousness of the questions they posed did not stop the government from going on with implementing the regulatory framework. Ignoring the plea of the Standing Committee to defer any decision on the new biotechnology part of the Canadian

[28] Fédération nationale des associations de consommateurs du Québec, Le futur entre nos mains, 13.

[29] OPTIMA Consultants, Understanding the Consumer Interest in the New Biotechnology Industry, November 1994.

Environmental Protection Act (CEPA), until their report was completed, Agriculture and Agri-Food Canada and Environment Canada released proposals for regulatory amendments in the August 1996 Canada Gazette; proposals that consolidated the role and powers of Agriculture and Agri-Food over environmental assessment of biotechnology products applied to agriculture by excluding these from application of the equivalency clause of CEPA. For the CIELAP, these amendments were simply a form of legislative amendments through regulation.

6.3 Regulatory adjustments

Within concerned ministries, the work to adjust the regulatory and legislative framework had been under way since the beginning of the 1990s. The principles of the 1993 regulatory framework had only served to confirm and justify orientations already adopted. Some important guidelines were sometimes elaborated and put to use before regulatory amendments were even adopted. Furthermore, most directives were not referred to directly in corresponding regulations. This regulatory approach based mainly on guidelines was praised by Canadian regulators for its flexibility and adaptability. Besides, because guidelines were the object of consultation processes distinct from the regulatory process, with no obligation to report, they could easily slip the attention of opponents, of the press, and even of the parliament. [30]

As will be exposed, Directive 94-08 Assessment Criteria for Determining Environmental Safety of Plants with Novel Traits and of Directive 95-03 Guidelines for the Safety Assessment of Livestock Feed from Plants with Novel Traits were both adopted before proposals for regulatory amendments were even published in August 1996. Also, the 1994 Draft Guidelines for the Safety Assessment of Novel Foods were published and used by Health Canada 5 years before the Regulations amending the Food and Drugs Regulations were formally adopted. Finally, while Environment Canada, in collaboration with Health Canada, was still trying to elaborate notification requirements for live products of biotechnology, Agriculture Canada had already put in place a semi-formal assessment process which was slowly being formalised and adjusted to the

[30] Non-regulatory guidelines don't have to be submitted to the same scrutiny and publicity as regulatory amendments do. In addition, the consultation process leading to their adoption does not have to be detailed as in a RIAS. Non-regulatory guidelines do not have to be published in the Canada Gazette and do not have to be the object of a Regulatory Impact Analysis Statement. If regulations and regulatory amendments can easily escape the attention of the parliament, non regulatory guidelines can be even more invisible.

specificity of biotechnology products. These informal arrangements had allowed regulatory authorities to conduct many product assessments before regulations were adjusted.[31] Authorities were thus aware that any change in the existing pattern of responsibilities could result in questioning of previous decisions and bring more attention to the issue.

Starting in September 1994 a series of regulatory amendments were thus proposed and later adopted with the goal to confirm the authority of existing agencies to regulate biotechnology products. The government claimed it wished to clarify responsibilities across departments but these amendments mostly secured the role of departments already involved in biotechnology evaluation and the authority of existing regulations over these products. In sum, it mostly formalized the existing informal arrangements. Some amendments gave AAFC uncontested authority to conduct environmental assessments of biotechnology derived agricultural products; some were adopted to make official guidelines already in use. Such was the case of the new novel food division of the Food and Drug Regulations adopted in 1999. Finally, the renewal of CEPA in 1999, although including a new biotechnology part, confirmed the role of CEPA as a safety net and *de facto* excluded Environment Canada from the activity of environmental evaluation for most biotechnology products. While taking health evaluation responsibilities out of the hands of Health Canada was unthinkable, it seemed that taking environmental evaluations away from Environment Canada was not only acceptable for the federal government, it was desirable. Within the Canadian framework, much was done in order for the end usage of the product to determine the locus of the evaluation and the applying regulations.

In conformity with the federal regulatory policy, all the amendments that will be described in the following pages were pre-published in the Canada Gazette Part I and, once adopted, published in the Canada Gazette Part II. "Pre-publication in Part I of the *Canada Gazette* gives various interested groups and individuals, as well as Canadians in general, a final opportunity to review and comment on a proposed regulation at the last stages of the regulation-making process, before it is enacted and published in Part II of the *Canada Gazette*." Each proposal had to be accompanied by a Regulatory Impact Analysis Statement that explained and justified the amendments, included costs and benefits analysis and described the consultation process. Although RIASes are not detailed documents, they were a direct access to the government's discourse about biotechnology.

[31] It is possible that Environment Canada would have done the same if environmental remediation products made with new biotechnology had been submitted for approval before 1997.

An examination of RIASes showed that the 1993 framework and the 1995 position statement by the federal government on the equivalency clause in CEPA really served as guidance in the making of these amendments and that these amendments were really the fruit of coordinated work between departments.

> *"In response to the concerns of the public regarding environmental and human health safety issues, and the requests from industry for a consistent and efficient government review of safety issues of biotechnology, it was recommended that a government-wide approach should be taken to ensure that appropriate regulations are applied to organisms, their parts and their products. This approach would also address Canada's international commitments under the United Nations Commission on Sustainable development and the United Nations Convention on Biological Diversity."*[32]

Before these amendments were even approved, 16 unconfined releases of GM plants, 15 novel feeds (from plants with novel traits), 4 genetically engineered supplements and 8 veterinary vaccines had already been approved in Canada under the informal, voluntary framework.[33] What's more, thousands of open field trials had already been conducted on Canadian land. What could have been considered outrageous by some was used as an argument by Agriculture Canada to keep authority over biotechnology products; the high number of approvals only showed that the department had the necessary experience to conduct these assessments.

6.3.1 Regulations under the administration of AAFC

The September 1994 proposals to include a definition of biotechnology in 5 federal regulations were amendments made with the clear intention to make sure that the assessment of agricultural products of biotechnology would remain under the authority of Agriculture Canada. Clarifying responsibilities across departments was the first step to achieve this. January 11, 1995, the Feeds Regulations, the Seeds Regulations, the

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[32] Agriculture and Agri-Food Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part II vol. 131, no.1 (1997): 21; Environment Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part II vol. 131, no.5 (1997): 700.

[33] Data from Agriculture and Agri-Food Canada. "Regulatory Impact Analysis Statement" Canada Gazette Part II, vol. 131, no.1,

Fertilizers Regulations, the Health of Animals Regulations and the Pest Control Products Regulations were all amended to include the definition of biotechnology already adopted in the CEPA and to make it clear that the use of the terms "feeds", "seeds", "fertilizers", "supplements", "animal pathogens" and "veterinary biologics" were meant from now on to include biotechnology derived products. As the Regulatory Impact Analysis Statement expressed it: *"The amendments will clarify for the public, and the agricultural and food production industry, that biotechnology products are regulated under these sets of regulations in a similar manner to products derived through traditional technologies."*[34]

With products derived through biotechnology officially covered by these regulations, the voluntary regulatory regime was formally – although partially – ended. Agricultural biotechnology products were then officially meant to be covered by these regulations "in a similar manner to products derived through traditional technologies".[35] The risk of economic losses if inadequate regulations were adopted was strongly underlined in the Regulatory Impact Analysis Statement that joined the proposals; so were the expected benefits of biotechnology products for agriculture and the environment. AAFC also made the claim, without demonstrating how, that these changes would be beneficial for Canada's industry. There was no mention, however, of potential environmental or health risks that could motivate further regulations although these amendments were partly made, in Agriculture Canada's own admittance, to reassure the public.

The government expressed its wishes to give "proper indication" to the public and the industry that regulation was adequate but never clearly expressed that it was looking to find the best regulation for the product. The overall goal of these regulatory adjustments was, it seemed, to reassure the public, to be in harmony with OECD's trading partners, and to decrease uncertainty for the industry: "*Through this clarification, the amendments will facilitate competitiveness of Canadian Agricultural biotechnology industry in the global market. (...) Failure to clarify that agricultural products of biotechnology are regulated could hinder the development of new and useful product types due to industry uncertainty of the regulatory system and consumer concerns about the safety of these products*."[36]

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[34] Agriculture and Agri-Food Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part II vol.129, no.2 (1995): 209.

[35] Ibid. p.209.

[36] Agriculture Canada. "Regulatory Impact Analysis Statement," Canada Gazette Part II vol.129, no.2 (1995): 209.

There was no discussion of possible risks that would motivate regulation but a clear statement that "biotechnology had the potential to improve quality and diversity of food products available to Canadians and allow producers to utilize more productive and environmentally sustainable inputs and practices."[37] In sum, biotechnology was part of the solution, environmentally friendly in most application, an idea that the federal government was very consistent in diffusing through the years.

Although the Standing Committee on Environment and Sustainable Development had, in June 1996, asked the government to defer decisions concerning the biotechnology part in CEPA until it had completed its study of biotechnology, the government simply went ahead and tabled another package of regulatory amendments that were to ascertain the authority of Agriculture Canada "to conduct environmental assessments prior to field releases" of biotechnology products under the Feeds Regulations, the Seeds Regulations, the Health of Animals Regulations and the Fertilizers Regulations. This second package of amendments, tabled in August 1996 and adopted in Decembre 1996 clarified responsibilities for environmental assessment of unconfined biotechnology products and unrestricted field releases: [38] *"These amendments have been developed to clarify that the Feeds, Fertilizers, Health of Animals and Seeds Act contain the authority to allow Agriculture and Agri-Food Canada to conduct environmental assessments prior to field releases (or trials) of products and to put in place procedures for notification and environmental assessments of products under these Acts."*[39]

Because they were submitted as a package, only one Regulatory Impact Analysis Statement covering all 4 regulations was submitted by Agriculture and Agri-Food Canada. It was remarkable that very little was said in this RIAS about environmental risks. While the technology was described as beneficial for Canada and Canadians in general: *"The new techniques of biotechnology, in particular genetic engineering, are being used to develop new agricultural and food products of benefit to both the Canadian public and other stakeholders in the agriculture and agri-food sector."*[40] Potential risks to the environment or human health were summed up in one short introductory sentence: *"Organisms have the potential to reproduce and spread in the environment, to cause*

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[37] Agriculture Canada. "Regulatory Impact Analysis Statement," Canada Gazette Part II vol.129, no.2 (1995): 211.

38 These amendments and the related guidelines did not, however, cover confined releases (field tests) of genetically modified organisms or products.

39 Agriculture and Agri-Food Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part II vol. 131, no.1 (19 December1996): 24. This package of amendments was also pre-published in Canada Gazette Part I in August 17, 1996.

40 Ibid., 23.

diseases in humans, domestic animals, plants and wildlife, to alter the balance of ecological systems, and to transfer their characteristics to other organisms."[41]

The cost/benefit analysis was mute about health and environmental safety issues. A lot was said, however, about the economic importance of the technology, costs for the industry and the government, about possible impacts on trade. But as an introductory statement to the section about benefits and costs, AAFC established clearly how its saw biotechnology input as contributing positively to the resolution of environmental problems that agriculture faces. The message sent by AAFC was that biotechnology was part of the solution for increased well-being: *"New agricultural products of biotechnology have the potential to improve the quality and diversity of food and food products available to Canadian consumers and allow producers to use more productive and environmentally sustainable agriculture inputs and practices."*[42]

As some alternatives to these amendments were discussed, the 1993 framework was used both as guidance and a justification for the path taken by the government. The rationale was very similar to the one used for the 1995 package. The need to avoid uncertainty for developers, the need to reassure consumers and the necessity to have an approach acceptable to Canada's trading partners justified the rejection of the status quo and self-regulation. Regulating under CEPA, at least for the environmental assessment, was ruled out because "it was contrary to the framework"…and it was well emphasized that the framework was the best way to achieve the government's goals: *"Implementation of regulations under the framework will provide for a government-wide regulatory process that addresses the needs of the Canadian public and industry and the requirements under Canada's international commitments."*[43]

AAFC argued that it had the experience and expertise to regulate agricultural products since it had done so for so many years: "Much of the information necessary to carry out environmental assessments under regulatory amendments is already required under current guidelines."[44] It thus led the reader to believe that specific directives had been set to do so for many years while, in fact, some directives were rather new (94-08) or (95-03) and others were still non-existent (confined field releases). No specific mention of the guidelines in question could be found, however, in legislation, regulations or in RIAS. Once again, readers had to blindly trust the claim of the government.

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[41] Ibid., 21.
[42] Ibid., 27.
[43] Ibid., 23.
[44] Ibid., 26.

With these regulatory changes, it was argued that "field releases" met "appropriate standards for environmental and human safety" and were "considered equivalent to standards under the Canadian Environmental Protection Act (CEPA)."[45] To achieve this equivalency with the Canadian Environment Protection Act, a definition of the terms "environment" and "toxic" was introduced in these four Regulations.[46] A definition of the term "novel trait", which means in essence that a characteristic has been intentionally selected, created, or introduced in a feed, seed or supplement through means of a specific genetic change, was also introduced in the Feeds regulations, the Seeds Regulations and in the Fertilizers Regulations.[47] The introduction, selection or creation of a trait by means of genetic change was not, however, sufficient to determine novelty. To be considered novel, a seed, a supplement or a feed was required, "in terms of its specific use and safety" not to be considered substantially equivalent to any characteristics of a similar seed, supplement or feed that was already approved in Canada (as set out in schedule IV and V of the regulations).[48] In other words, these amendments formalized the use of the principle of substantial equivalence; once approved in Canada, a "novel" product was no longer considered "novel" and could even be used as a basis of comparison for the evaluation of other similar genetically modified products.

In essence, these amendments to the Seeds Regulations, the Feeds Regulations, to the Health of Animals Regulations, and to the Fertilizers Regulations imposed information requirements for environmental assessments including release protocols and confinement measures "to mitigate the establishment and spread of novel products and the interaction in the environment." Applicants were required to submit "all other information and test data with respect to the novel feed that are relevant to identify risks

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[45] The CEPA standards have been tabled almost simultaneously, in August 1997. Agriculture and Agri-Food Canada, "RIAS," Canada Gazette Part II Vol. 131, No.1 (Dec. 1996): 24.

[46] Environment meant « air, land and water; all layers of the atmosphere; all organic and inorganic matter and living organisms and; the interacting natural systems that include components" already referred to. Toxic meant that a product was "entering or may enter the environment in a quantity or concentration or under conditions (a) having or that may have an immediate or long-term harmful effect on the environment; (b) constituting or that may constitute a danger to the environment on which human life depends; or (c) constituting or that may constitute a danger in Canada to human life or health. In "Seeds Regulations' Amendments", SOR/DOR 97-9, Canada Gazette part II vol. 131, no.1 (1996): 53-54.

[47] The Health of Animals Regulations makes a direct reference to "live genetically modified veterinary biologic". SOR/DOR 97-8, s120.1.

[48] SOR 97-6. Canada Gazette part II vol. 131, no.1 (1996): 17. SOR 97-7, Canada Gazette part II vol. 131, no.1 (1996): 45. SOR 97-9, Canada Gazette part II vol. 131, no.1 (1996): 53. The *Health of Animals Regulations* had a different structure but a similar impact. In this case, it was the definition of « live genetically modified veterinary biologics" that was central: "a live veterinary biologics that contains or is made from an organism and is produced by recombinant DNA technology." It excluded "a species that is substantially equivalent to a species of organisms contained in a veterinary biologic…" for which a product licence has been issued. In SOR 97-8, Canada Gazette part II, vol. 131, no.1 (1996): 49-50.

to the environment… that are in the person's possession or to which the person ought reasonably to have access." A description of the methodology used to generate and submit data was also required.

These requirements, especially those regarding environmental assessments were vague. In the regulations, no reference was made to the guidelines although some were adopted before the amendments came into force.[49] In the case of the Feeds Regulations and of the Seeds Regulation, amendments did not seem to change the way products were assessed in the short term: guidelines 94-08, which were revised for the first time in September 2000. In the case of unconfined environmental release of plants with novel traits, assessment of environmental safety was based on five criteria:

- potential of the plant with novel trait (PNT) to become a weed of agriculture or be invasive of natural habitat;
- potential for gene-flow to wild relatives whose hybrid offspring may become more weedy or more invasive;
- potential for the PNT to become a plant pest;
- potential impact of the PNT or its gene products on non-target species, including humans;
- potential impact on biodiversity.[50]

This system of substantial equivalence was already in use in Canada by means of informal arrangements (outside legislations/regulations) with the adoption of the guidelines Dir 94-08 – *Assessment criteria for Determining Environmental Safety of Plants with Novel Traits*. According to Barrett, it allowed the rapid evaluation and approval of derivative varieties. For example, once GT73, one of the first herbicide tolerant Canola to receive market approval was accepted in Canada, other derivative varieties of glyphosate tolerant canola were also approved but, this time, the comparison to establish substantial equivalence was not made with a traditional counterpart but in comparison with GT73 and, in some cases, using the same data.[51] When the regulatory amendments came into force in December 1996, many plant varieties had already been approved and declared safe for the environment or for animal health using Directives 94-08 or Directive 95-03. Most of these varieties concerned herbicide tolerant canola, corn

[49] Regulatory Directive 94-08, "Assessment Criteria for determining Environmental Safety of Plants with Novel Traits" was first published December 16, 1994. Regulatory Directive 95-03…

[50] Agriculture and Agri-Food Canada. Regulatory Directive 94-08 "*Assessment Criteria for determining Environmental Safety of Plants with Novel Traits*. Retrieved 01/06/2005. http://www.inspection.gc.ca/english/plaveg/bio/dir/dir9408e.shtml

[51] Katherine J. Barrett, "Canadian Agricultural Biotechnology. Risk Assessment and the Precautionary Principle," (PhD diss., Department of Botany, University of British Columbia, 1999), 200.

or soy, insect resistant potatoes or corn using Bt innovations. These crops represented a large percentage of the crops grown in Canada. In other words, of the 16 evaluations that were already completed in the end of 1996, many had benefited from the equivalency criteria and many were to be or had already been used to facilitate the approval of derivatives varieties. The 1996 amendments made provisions to exclude products already authorised from being reassessed.

This tends to confirm the analysis that the Royal Society report made of the use of the concept of substantial equivalence in Canada which was, in their view, "the most critical element in the current approval process". In Canada, the concept of substantial equivalence functions "as a decision procedure for facilitating the passage of new products, GM or non-GM, through the regulatory process." It is used, they argue, as a "decision threshold" while it should function as a "safety standard", i.e. as a "scientific basis for the application of safety standards", where scientific findings "become the justification for an assumption of safety". The Royal Society concluded that in practice, the exemption of new plants from full environmental safety assessment based on "familiarity" or "substantial equivalence" were rather based on "assumptions about the equivalence of the organisms, by analogy with conventional breeding." Finally, the Royal society panel also suggested that, although substantial equivalence was commonly used by government regulatory agencies as a "decision threshold", "public statements defending the use of the concept often [played] upon its inherent ambiguity by suggesting" it was used as a "safety standard".[52]

6.3.2 Regulations under CEPA

Although CEPA-1988 had the authority to regulate biotechnology products, it only partly started to do so in 1994, with the adoption of the New Substances Notification Regulations (NSNR). These Regulations, covering many chemical products but including some inanimate products of biotechnology (biopolymers and biochemicals), described the conditions under which a substance shall be evaluated for its toxicity before getting approval to be manufactured or imported in Canada. This earlier version of the New Substances Notification Regulations was however much more adapted to traditional chemical substances than to biotechnological products.

[52] Royal Society of Canada, Elements of Precaution: Recommendations for the Regulation of Food Biotechnology in Canada, (Ottawa: The Royal Society of Canada, 2001): 180-183.

In August 1996[53], as part of the government-wide approach promoted in the Federal Framework for regulating biotechnology, a proposal was tabled to parliament to extend the requirements of the New Substances Notification Regulations to new substances that were micro-organisms and organisms. This proposal was adopted in February 1997. This new part was designed in such a way that information requirements were different according to the proposed use: unconfined use of micro-organisms, unconfined use of organisms other than micro-organisms, experimental field studies of micro-organisms, confined laboratory use of micro-organisms and site-specific re-introduction of micro-organisms. These amendments also introduced special information requirements for inanimate products of biotechnology (biopolymers and biochemicals), which were an addition to the existing 1994 regulations. The consultation process that led to the 1994 NSRN also resulted, in reaction to an objection from the industry, in the removal of the definition of "genetically modified".[54] Within these regulations, genetically modified organisms, micro-organisms or inanimate products of genetic engineering were included, without any special mention, in the broad definition of "biotechnology product" defined as "a substance that was produced by means of biotechnology". Inanimate products of biotechnology were referred to as biopolymers or biochemicals; and animate products of biotechnology were included in one of two categories: "micro-organisms" or "organisms".[55]

The 1994 and 1997 versions of the NSNR were the end-products of a long process of elaboration that started in 1985. A few drafts were produced (1987, 1990) that did not even get to be published in the Canada Gazette but that were distributed for comments to different groups, including environmental defence groups. Every proposal by Environment Canada and Health Canada, until 1994, included a benchmark assessment procedure for GM plants and a special part for biotechnology products. However, the adoption of the Regulatory Framework in late 1992 and the government's re-positioning in 1995 definitely put an end to this approach. In sum, EC and HC had to conform to informal arrangements that had been informally put in place by AAFC and IC in the past decade. After 1995, CEPA's biotechnology section was aimed to become a safety net for those products that were not to be covered by other federal legislation.

In the 1994 version of the NSNR, this intention was proposed as an interpretation of the regulations: "The regulations could be considered as being "residual" in the sense that they do not apply to new chemical substances and polymers whose sole use is

[53] While the Standing Committee had asked the government to wait for the conclusions of its inquiry.

[54] Environment Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part II vol. 131, no.5 (1997), 712.

[55] Ibid., 712.

encompassed by other federal Acts…"[56] The 1997 NSNR formalised the intention, announced in the RIAS of the 1994 version, to exclude new substances whose use were not already covered by existing federal legislations:

> *"For a greater certainty, the Regulations do not apply in respect of a substance that is manufactured or imported for a use that is regulated under any other Act of Parliament that provides for notice to be given prior to the manufacture, import or sale of the substance and for an assessment of whether it is toxic, including, without limiting the generality of the foregoing, the Feeds Act, Fertilizers Act, Health of Animals Act, Pest Control Products Act and Seeds Act."*[57]

To those opposing the inclusion of this subsection because it would "undermine the legal test for equivalency established by CEPA", the government responded that subsection 3(1) was only meant to clarify, not to replace paragraph 26(3)(a) of CEPA and that "the determination of exemption [was] the sole responsibility of the Minister responsible for the other Act".[58] In so doing, the government nevertheless chose to ignore recommendations of the Standing Committee on Environment and Sustainable Development and the significant opposition by NGOs expressed during the process of renewing CEPA.[59] The RIAS did mention a certain opposition: "stakeholders were concerned that this apparent exemption could undermine the legal test for equivalency established by CEPA."[60] However, the Standing Committee on Environment and Sustainable Development **is not** a stakeholder.

When it came to live products of biotechnology, the outcome of the renewal process did give the impression of a greater openness on the part of the government toward the Standing Committee on Environment and Sustainable Development

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[56] Environment Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part II vol.128, no.7 (1994), 1483 .

[57] SOR/DORS 97-119, "Regulations Amending the New Substances Notification Regulations," Canada Gazette Part II, vol.131, no.5 (18 February 1997), subsection 3(1), 676.

[58] A rather puzzling answer that can be found in Environment Canada. "Regulatory Impact Analysis Statement". Canada Gazette Part II, vol.131, no.5 (1997), 713.

[59]The Standing Committee on Environment and Sustainable Development recommended that "if sectors of the biotechnology industry are to be regulated under legislation other than CEPA – which is the case under the Federal Regulatory Framework – notification and assessment standards required by the regulations under that legislation be as stringent as those promulgated under CEPA. in Biotechnology Regulation in Canada, chapter 5. This situation was also exposed by Bloc Québécois MPs in the Minority Report produced as a appendix of the report referred above: Biotechnology Regulation in Canada, minority report.

[60] Environment Canada, "RIAS," Canada Gazette Part II, vol.131, no.5 (1997), 713.

recommendations. They were to be dealt with under a specific section (Part 6). Section 26(3) of 1988 CEPA was to be kept intact with the added requirement that a decision document explains why the regulation of a federal department was equivalent to those published under CEPA. With the new 1999 CEPA, a new part (Part 6) was added to deal specifically with "animate products of biotechnology" while the regulation for toxic substances that were new to Canada continued to apply to inanimate products of biotechnology.

In sum, Part 6 of the Canadian Environmental Protection Act was to establish a "regulatory regime for the assessment and control of living organisms" while Part 5 covered chemical substances from biotechnology.[61] In both cases, echoing section 26(3)(a) of 1988 CEPA, exemptions were made possible if the substance or the living organism was regulated under any other Act of Parliament that provided for notification of information and toxicity assessment before the living organisms were imported, manufactured or sold in Canada. The new CEPA also introduced the conditions under which a given Act of Parliament can be considered to meet the conditions to be exempted. *"The Governor in Council has the exclusive responsibility for determining whether or not the requirements referred to (…) are met by or under an Act of Parliament*" or by regulations made under that Act. If the Governor in Council determines that an Act or Regulations under an Act does "*provide for notice to be given before the manufacture, import or sale of the living organism [or substance] and for an assessment of whether it is toxic or capable of becoming toxic*"[62], the Act and Regulation was added to schedule 2 (substances) or 4 (living organisms) of CEPA. "*The fact that an Act or regulations are listed in Schedule 2 [or Schedule 4] is conclusive proof that the requirements referred to in legislation [section 81 6(a) or 106 (6)(a)] are met.*"[63]

But the Governor in Council decisions failed to demonstrate that this "proof" was based on the equivalence of assessment measures for toxicity or for environmental impacts. It seems that to provide for some sort of notice requirements and toxicity assessment was enough to declare an Act or Regulations met the requirements. There were no evidence that a thorough comparison was made between CEPA's NSNR and the Acts and Regulations that were to be proclaimed equivalent.

The determination of "equivalency" by the Governor in Council was a new requirement and its coming into force was delayed until September 2001. This delay gave the government some time to react and make sure Acts and regulations that were

[61] D. Cameron, D. Blasioli and M. Arès, Annotated Guide to CEPA, I-6.

[62] Canadian Environmental Protection Act, Statutes of Canada Volume 1, Chapter 33, 1999 , Part 5, subsection 81 (6)(a) p.55 and Part 6, subsection106(6)(a) p.79.

[63] Canadian Environmental Protection Act, Part 5, subsection 81 (6)(a) p.55 and Part 6, subsection106(6)(a) p.79.

targeted did conform to requirements. The 1997 amendments to the Seeds Regulations, the Feeds Regulations, the Health of Animals Regulations, and to the Fertilizers Regulations gave ammunition to those arguing that entire categories of products already underwent sufficient scrutiny. The adoption of Directives 2001-07 "*Conducting Confined Research Field Trials of Plants with Novel Traits in Canada"* probably contributed to the decision as well. In August 2001, on the recommendation of the Minister of the Environment, of the Minister of Health and of the Minister of Agriculture and Agri-Food, Schedule 2 concerning substances new to Canada and Schedule 4 concerning living organisms were amended to include the Pest Control Products Act and Regulations, the Fertilizers Act and Regulations, the Feeds Act and Regulations, the Seeds Act and regulations and the Health of Animals Act and Regulations.[64]

The RIAS provided a comparison of the notification and assessment provisions within CEPA with notification and assessment provisions within these Acts but never compared the detail of the regulations as to their capacity to evaluate possible environmental impacts. The main goal was to avoid regulatory redundancy. These proposed Orders were published in the Canada Gazette Part I for a 60-day comment period and invitations to comment were sent to various groups but only a few comments (from organisations representing farmers and from industries, none from consumers and environmental defence groups) were received.[65] After having fought for years (since the mid 1980s) to obtain that CEPA be at least a benchmark for other legislations, can the environmental defence groups be blamed for stopping investing time and energy to try to convince the government, a government that had so far proven rather hermetic to their point of view?

6.3.3 Food and Drugs Regulations

In 1995, the Canadian government proposed to add a new division to the Food and Drug Act. This new division would "define the concept of 'novel food' and provide a notification prior to sale or advertising for sale of such products".[66] "*Draft guidelines for the safety assessment of novel foods* were published in 1994 and started to be used while the work on the regulatory amendments continued for 5 years. The amendments were finally adopted in 1999, formalizing the approach established under the guidelines.

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[64] SOR/2001-300, SOR/2001-301, SOR/2001-302, SOR/2001-303, SOR/2001-304, SOR/2001-305, SOR/2001-306, SOR/2001-307. The Seeds Act and regulations and the Health of Animals Act and Regulations only in Schedule 4.

[65] As reported in Environment Canada, "RIAS," Canada Gazette Part II, vol135, no. 18 (2001), 1883.

[66] Health Canada, "RIAS," Canada Gazette Part I, 6 (August 1995), 2987.

At the time, 42 "novel foods", mostly from genetically modified plants, had already been assessed and considered acceptable for sale in Canada based on the guidelines developed in 1994. In its 1998 regulatory proposal, Health Canada candidly admitted that the use of the guidelines without formal regulations equated to the use of a voluntary system: "*Currently, a voluntary system exists where firms seeking to place a novel food on the market voluntarily submit information to the Department, enabling a safety review."*[67]

The control mechanism chosen by Health Canada under the Food and Drug Regulations was pre-market notification which entailed "the submission of information regarding the product in question to Health Canada such that a determination can be made with respect to its acceptability as food prior to sale"[68]. As a result of the consultations that followed the first pre-publication of the regulatory amendments, the department expressed its intention to be more selective and wished "not to review all foods new to the Canadian market", only those that are "novel". But the "novel food" definition had been modified from the initial proposal. It still included food from genetic engineering but, as a result of comments from industry representatives, the definition of "novel food" was modified to include the concept of "prior safe use" which excluded foods new to the Canadian market, but which had a history of safe use in other countries. Using the concept of "major change", foods produced through new processes but that resulted in minor change in the food's composition, structure, nutritional quality or microbial or chemical safety were also exempted.[69] Of course, products already approved using the voluntary guidelines would also be exempted from this evaluation.

In the first proposal, Health Canada adopted a very positive tone to discuss the advantages of biotechnology, as this statement from subsequent RIAS shows:

> *"Advances in food science and biotechnology are resulting in the development of a variety of foods that have not been previously available in the Canadian marketplace, or that are modified from their traditional composition. These products, generally referred to as "novel foods", offer the potential to significantly enhance the quality, quantity and nutritional value of the food supply."*[70]

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[67] Health Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part I, (26 September, 1998), 2502.

[68] Health Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part II vol. 133, no. 22 (1999), 2412.

[69] These are major modifications between the 1995 version of amendments and the final version adopted in 1999. Health Canada, "Regulatory Impact Analysis Statement," (1999), 2414-2417.

[70] Health Canada, "Regulatory Impact Analysis Statement," Canada Gazette Part I vol. 129 (6 August 1995), 2987. Subsequent RIASes, in 1998 and 1999, adopted a more neutral tone.

Two kinds of benefit of the regulations were identified: enhanced level of protection for the consumer and enhancement of the "possible successful marketing of such products by providing a degree of assurance to the public regarding their safety." Possible health risks were not discussed in any of the RIAS conducive to the adoption of these amendments.[71]

6.3.4 The Canadian Food Inspection Agency

In 1996, as a result of the 1994 federal Program Review, the government announced his intention to create a single agency that would become responsible for federal food inspection and animal and plant health services. These responsibilities were previously scattered between four ministries: Industry, Fisheries, Agriculture and Agri-Food and Health. The creation of the Canadian Food Inspection Agency (CFIA), in April 1997, brought together all these food inspection services under a single, semi-independent, agency where, it was hoped, these activities would be delivered more efficiently.

Health Canada, as the ministry in charge of the Food and Drugs Act and Regulations, delegated its food inspection activities to CFIA but kept its authority over policy formulation, and remained in charge of establishing standards for the nutritional value, quality and safety of food. Health Canada also kept the responsibility over the assessment of safety and effectiveness of human and veterinary drugs.[72] CFIA and Health Canada were as well jointly responsible for food labelling under the Food and Drug Act: Finally, Health Canada was in charge of health and safety aspects of labelling while CFIA had the mandate to protect consumers against fraudulent or misleading affirmations on labels or in publicity. Concerning genetically modified foods and products, Health Canada was still in charge of establishing novel food safety norms evaluations and CFIA was in charge of environmental risks evaluation prior to market introduction, commercial uses or field trials.

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[71] Health Canada, "RIAS," Canada Gazette Part I, vol. 129 (6 August 1995), 2987 and subsequent RIASes in Canada Gazette Part I vol. 132 (26 September 1998) and Canada Gazette Part II vol.133, no.22 (1999).

[72] Canadian Food Inspection Agency, Canadian Food Inspection Agency sous-fonds. Histoire Administrative (Ottawa: National Archives of Canada) Retrieved 6/13/02. http://data4.archives.ca/netacgi ; Canadian Food Inspection Agency, Plan d'entreprise 1997-2000 (Ottawa: CFIA, 1997), 1.

The Agency was to be a departmental corporation with independent legal status and a duty to report to the Minister of Agriculture and Agri-Food. The Agency thus had the obligation to produce and submit an annual report and, every five-years, a corporate business plan. Both documents were to be transmitted to both chambers of the Parliament by the minister in charge.[73] According to Prince, within this organisational arrangement, the Minister had the principal policy role for the Agency while CFIA's President had the lead management role. At the moment of its creation, CFIA's mission was to contribute to a safe food supply and accurate product information; to contribute to the continuing health of animals and plants for protection of the resource base; and to facilitate trade in food, animals, plants and their products.[74] In practice, however, CFIA also integrated policy development and communication activities. Here is how Price describes its activities:

> *"The Agency develops policies, legislation and regulations; has a significant in-house scientific capacity of laboratory services and testing centres; and, administers a range of inspection, establishment registration, product certification, licensing, enforcement and compliance programs. As well, CFIA engages in risk communication; offers consumer education services; and, audits the implementation of detection systems and risk analyses done by industry. "*[75]

In practical terms, the creation of CFIA increased and concentrated most of the responsibilities for food inspection in the hands of the minister of Agriculture and Agri-Food. Not only was the new agency under the sole authority of the Department of Agriculture and Agri-Food, it was mostly staffed with employees already performing food inspection duties within the four ministries mentioned above. This meant that a great proportion of the staff came from the Food Inspection Directorate of Agriculture Canada, the ministry whose food inspection activities was the most important (about 10 times more important than that of the 3 other departments taken individually).[76] This also globally meant that it was probably easy for the internal culture of AAFC, including a

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[73] Canadian Food Inspection Agency, Plan d'entreprise 1997-2000, 1-3.

[74] Canadian Food Inspection Agency, Plan d'entreprise 1997-2000; Canadian Food Inspection Agency, sous-fonds Histoire Administrative, National Archives of Canada. Retrieved 6/13/02. http://data4.archives.ca/netacgi/

[75] Michael Prince, Regulators and Promoters of Genetically Modified Foods in the Government of Canada : An Organizational and Policy Analysis, 2000, 18.

[76] Témoignage de M. Ronald L. Doering, directeur exécutif, Bureau des systèmes d'inspection des aliments, Agriculture et Agroalimentaire Canada in Comité sénatorial permanent de l'Agriculture et des forêts, Fascicule 10 (OTTAWA, le jeudi 20 février 1997); Agence canadienne d'inspection des aliments, La nouvelle Agence canadienne d'inspection des aliments (ACIA), Bulletin d'information du Bureau de la biotechnologie, mai 1998.

certain way to deal with the public and specific stakeholders[77] to preserve itself and to be replicated within the new structure.

In many ways, CFIA can be compared with France's Agence Française de sécurité sanitaire des aliments (AFSSA). The creation of the French agency in 1999 also meant that a number of laboratories and research facilities were grouped together.[78] However, while CFIA was mainly under the authority of Agriculture Canada, French AFSSA was under the joint responsibility of three ministers: Agriculture, Health and Environment. AFSSA was also put in charge of coordinating food inspection activities that were previously scattered in different ministries and agencies, but its mandate also included the responsibility to deliver authorisations for veterinary drugs, which was not the case of CFIA. Finally, contrary to CFIA, AFSSA was not the sole agency responsible for GMOs: AFFSA was in charge of evaluating food security aspects of GMOs while the CGB, under the joint responsibility of the ministers of Agriculture and of the Environment, was still in charge of environmental and public health aspects.

Both AFSSA and CFIA came to participate in the debate, but in a very different ways because their level of autonomy from the government and their power to orient their work was very different. AFSSA could commission itself to do any study it judged relevant or be commissioned by any of the three ministries to which it reported or by any officially recognized consumer association. Opinions and reports from the French agency were public and eventually had a role in feeding the debate (see chapter 5). In Canada, CFIA was confined to the administration and enforcement of food inspection regulations with some consumer information duties but could not, in any case, undergo research at the demand of a third party or on its own initiative and could not give scientific opinions based on its own research. Agriculture Canada would publish information based on its own research, but mostly concerning agronomical concerns.

As a matter of fact, CFIA had, in the case of GMOs, obvious communication activities of a rather unscientific nature. As soon as it was created, the agency's Office of Biotechnology posted a number of Web pages intended to inform citizens on different aspects of biotechnology. These pages however included information meant to reassure consumers as to the quality and efficiency of the existing regulatory framework, highlighted GMOs potential benefits, and omitted to mention any risks. In France, industries were the ones diffusing such information. Information posted on French departmental web pages – even from ministries traditionally in favour of biotechnologies,

[77] Expression borrowed from Bruce G. Doern, Inside the Canadian Biotechnology Regulatory System, 7.

[78] See Chapter 5 for more detailed description of AFSSA.

such as Research or Agriculture, was nuanced about the risks and benefits of the technology.

The creation of CFIA was, in a way, trying to answer the concerns about the double role of ministries in charge: promoters and regulators. Although in the government's opinion, these two functions were totally independent from one-another within Agriculture and Agri-Food Canada, the creation of the agency was meant to further separate research and development from inspection and evaluation activities.[79] But the activities of the Office of biotechnology within CFIA came to question this and led some to conclude that CFIA was indeed involved in promotional activities:

> *"The Office of Biotechnology within CFIA was transferred from AAFC and was formerly called the Biotechnology and Strategies Coordination Office. The Office of Biotechnology does not contain a scientific staff engaged in inspection or lab activities. It is not involved in regulation or safety assessments at all. Rather, the Agency's Office of Biotechnology serves an interdepartmental relation role providing a link to the Canadian Biotechnology Secretariat in Industry Canada, and a communications function."*[80]

Prince also noticed, and so did we, that, if the Web page of CFIA's Office of Biotechnology offered information about regulations, the consultation process, environmental aspects, food safety, and labelling; it did so with the obvious goal to reassure citizens about the choices that were already made by the government and became a propaganda tool for governmental decisions. As Prince highlighted it, a problem arises "when the telling becomes selling" and leads to discrediting other policy alternatives. In the case of CFIA's Office of Biotechnology, he argued that not only did the message communicated "accentuate[d] the advantages and benefits of biotechnology" and "downplay[ed] or fail[ed] to mention possible harms and risks"; it also discredited other policy approaches.[81] For example, here is how the Office exposed the benefits of biotechnologies:

> *« En donnant la possibilité d'améliorer la résistance des cultures aux maladies et aux ravageurs, d'accroître la valeur nutritionnelle des aliments, de sélectionner des animaux plus performants et en meilleure santé et d'élaborer des*

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[79] Agence canadienne d'inspection des aliments, Réglementation de la biotechnologie agricole au Canada : Le point, Bulletin d'information du Bureau de la biotechnologie, 01 avril 1997. Site internet de l'agence. CFIA answers the following question : « Existe-t-il un conflit d'intérêt entre la fonction de promotion et celle de réglementation de la biotechnologie au Canada? »

[80] Prince, Regulators and Promoters…, 24.

[81] Prince, Regulators and Promoters…, 24.

tests diagnostiques plus rapides et plus exacts des maladies végétales et animales, la biotechnologie présente une gamme d'avantages potentiels sur le plan environnemental, social et économique dont tous les Canadiens peuvent tirer profit. »[82]

The Office also endeavoured to explain the regulatory framework, outlining the diligence and caution of the government in dealing with biotechnology products, and praising the quality of the Canadian food supply. Furthermore, the Office praised the Canadian regulatory approach based on guidelines:

"Le gouvernement adopte une démarche méthodique, approfondie et prudente dans l'application de la réglementation en matière d'innocuité des aliments. L'approche graduelle appliquée à l'enregistrement des produits de la biotechnologie illustre bien la prudence de cette démarche. Une évaluation environnementale est requise dans le cas des essais au champ des végétaux modifiés, et une autre est également requise avant leur pré-commercialisation ou leur commercialisation.»[83]

« De nombreux ministères ont recours aux lignes directrices afin de fournir une interprétation détaillée d'un règlement. Comme les lignes directrices sont plus flexibles et plus faciles à actualiser qu'un règlement, elles s'avèrent un moyen approprié de réglementer les produits. De nouvelles informations se font jour sur une base régulière, et cela engendre de nouvelles exigences pour le système de réglementation; les lignes directrices permettent une réaction plus rapide à cet égard. »[84]

Finally, here is how the Office defended the government's position on labelling:

« Certains groupes d'intérêt et certaines personnes ont manifesté le désir que tous les produits issus du génie génétique portent une étiquette spéciale obligatoire. Il est toutefois ressorti des consultations que les coûts et les difficultés

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[82] Agence canadienne d'inspection des aliments. « Produits agricoles issus de la biotechnologie :Quels sont les avantages? » Bulletin d'information du Bureau de la biotechnologie, Site Internet de l'agence. 1997 ou 1998.

[83] Agence canadienne d'inspection des aliments, Réglementation de la biotechnologie agricole au Canada : Préoccupations matière d'innocuité des aliments, Bulletin d'information du Bureau de la biotechnologie, 01 avril 1997. Site Internet de l'agence.

[84] Agence canadienne d'inspection des aliments. La Réglementation de la Biotechnologie Agricole au Canada : Questions Environnementales. Bulletin d'information du Bureau de la biotechnologie, 22 mai 1998. Site Internet de l'agence.

associés à un tel étiquetage peuvent être plus considérables que les avantages pour les consommateurs canadiens.»[85]

In fact, CFIA, through the communications made by its Office of Biotechnology, actively participated in the general discourse about biotechnology. Not only did it try to convince citizens that things were done properly, it also contributed to discredit opposing opinions about regulation, evaluation and labelling. CFIA went as far as implying that the Canadian position on labelling was the fruit of consultations – while there was strong opposition to it; or that a thorough environmental assessment was conducted before GMOs were allowed to be released in the environment – while there was evidence that many ecological aspects were neglected in the assessment and no environmental research was conducted by CFIA itself (see next section). This tends to show that the Canadian government and the public administration were already very much aware of the power of words in this issue and very much determined to pursue the same policy line. It also highlighted some major elements of the government's strategy: praising and supporting its own policies to the point of ignoring any criticism, of discrediting alternatives, and of denying any need for improvement.

6.4 Evaluation process and transparency

In Canada, regulatory issues rarely captured the attention of the press. With the exception of labelling and rBST (addressed in the next chapter), it is safe to say that biotechnologies did not become a case of national political crisis until 2001. Until then, regulations, the decision process and the evaluation process were not the object of much public interest. Conversely, the structure of authorities in charge and of the evaluation process raised such transparency issues that it most certainly contributed to keep the matter away from scientific and public inquiry.

To our knowledge, Barrett was one of a few experts who were granted access to the data used to authorize unconfined release of GMOs. She examined the case of Monsanto's Roundup Ready glyphosate tolerant *Brassica napus* line GT73. Regulatory guidelines (94-08) were followed and this herbicide tolerant Canola (HTC) was approved in March 1995. AAFC's final decision was to the effect that "unconfined release of GT73 into the environment was safe".

[85] Agence canadienne d'inspection des aliments, Étiquetage des aliments issus du génie génétique au Canada, Bulletin d'information du Bureau de la biotechnologie, 22 mai 1998. Site Internet de l'agence.

Using this case study, Barrett evaluated this process using four criteria: scope of the inquiry, methods of assessment, data reasoning, and conclusions reached. She concluded that the scope of inquiry used to reach a decision narrowly considered agronomic impacts while neglecting environmental safety, for example, the indirect impact of HTC on insect population. In her opinion,"...the scope of the tests was defined not by considerations of environmental hazards per se but by concerns for crop rotation efficiency"[86] So she concluded that risk assessment for HTC "was more germane to the narrow goals of pre-commercial variety trials and food/feed safety than to understanding the interactions of HTC within agricultural and non-agricultural ecosystems."[87]

Evaluating the HTC assessment against accepted standards of "good science" – statistical validity of data, acknowledgement of relevant scientific literature, and conclusions based on empirical experiments – Barrett concluded that "the working definition of science in what AAFC intended as a "science-based risk assessment" was very narrow and very week indeed."[88] In fact, conclusions reached by Barrett concerning the methods used were troublesome:

> *"Even within the limited and impractical framework set out by AAFC, Monsanto's risk assessment was of arguable merit: Procedures were often unclear, observations were not systematic (at least no indication of a system was provided); methods and test parameters were variable; experimental controls were of questionable relevance; number of replications were minimal; temporal and spatial scales were limited. If we take peer-reviewed scientific publications as one measure of good (or at least sanctioned) science, as AAFC and Monsanto claim to have done, it seems unlikely that Monsanto's methods could withstand such scrutiny (all other things being equal)"*[89]

Barrett also criticized the lack of transparency; to realize her case study, she reported having to gather information through a lengthy and costly access to information process, with no guaranty that the company involved would allow the information to be released. Based on her own experience, she concluded that, because of the "...lack of publicly accessible data on risk assessment process" which "effectively precludes comprehensive critical analysis", "[w]e must trust the claim of the government and

[86] Barrett, Canadian Agricultural Biotechnology, 166.
[87] Barrett, 197.
[88] Ibid., 199.
[89] Ibid., 202.

industry that decisions are based on sound science…"[90] The information CFIA was releasing concerning the approval process did not allow peer review:

> *"The information that CFIA makes available to the public regarding their approval decisions explains the basis for approval of unconfined release of a GM plant into the environment, such as the criteria to be addressed in deciding whether environmental safety is threatened, but neither the design of the experiments on which the assessment was based, nor their results, are included in the public Decision Documents."*[91]

In 2000 and at the request of Health Canada, the Canadian Food Inspection Agency and Environment Canada, the Royal Society of Canada was asked to constitute a panel to study and report on the Future of Food Biotechnology. The panel came to conclusions similar to Barrett's concern about the transparency of the process and the need for external and independent peer review. It acknowledged that the regulatory directives did indicate to applicants that statistically valid experimental designs were required, and that data provided by applicants should address the key criteria for environmental safety assessment. The RS panel however underlined that, "[i]n the absence of independent peer review, (...) the Decision Document [was] in no sense equivalent to a peer-reviewed scientific paper, and (...) the decision-making process in general [lacked] transparency, and thus credibility." The Panel was also concerned by the degree of discretion of the regulatory agency which, in the absence of independent review, could allow "inappropriate decisions" to be made.[92] A former Health Canada senior scientist we interviewed referred to this process as a "black box" where only those within really knew what was being done.[93] The fact that even the Royal Society of Canada, mandated by three federal agencies, was not granted access to these data, tended to support this observation: *"...in our direct discussions, Health Canada personnel did not provide sufficient information to allow us to assess the extent or rigour of the protocols used. Our request at the time for detailed data pertinent to those protocols produced no subsequent response. The Expert Panel was therefore unable to verify the overall consistency or appropriateness of the assessment process."*[94]

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[90] Barrett, 202.
[91] The Royal Society of Canada, 36.
[92] The Royal Society of Canada, 36.
[93] X, Former Health Canada Scientist, interviewed by author, Ottawa, Canada, 25 April 2002.
[94] In response to a letter by Ian C Green, Deputy Minister, Health Canada to Dr William Less of the Royal Society of Canada in reaction to the report. Letter signed by Conrad Brunk and Brian Ellis, Co-Chairs of RSC Expert Panel on the Future of Food Biotechnology, February 5, 2001.

Once the Royal Society report was tabled, it was reported that it did not received the standard congratulatory notes by the three ministers who had commissioned the study. On the contrary, regulatory authorities worked to discredit its conclusions, arguing that the Royal Society panel of experts *"had a poor understanding of the processes*" and "*did not know what it is talking about"*.[95]

It is hard to imagine that the French government, which so often relied on experts to get advice, would discredit the work of scientists like the Canadian government did with the Royal Society report. Even more troubling, elected officials seemed to be relying on government officials and spokespersons to deliver their message to the media. The report was rejected as a whole and the government never committed itself to debate the conclusions and recommendations, or to reflect, publicly or not, on the evaluating process. One government official went so far as to imply that the Royal society experts might have consulted web pages that were not meant for expert evaluation but for lay people and that, instead, they should have asked for the relevant documents: *"Le comité doit avoir consulté les mauvais documents sur le site Web du ministère, a avancé Mme Dodds, selon laquelle certains d'entre eux sont destinés au grand public et non pas aux experts. Conrad Brunk, coprésident du comité, a pour sa part indiqué que ce dernier s'était penché sur tous les documents accessibles à tous, mais que certains principes clés du processus de réglementation fédérale portaient à confusion. »*[96]

If this is true, it leads to the conclusion that the panel did not get all the information and all the collaboration it needed from the three federal agencies involved. Again, it is hard to imagine that an expert committee mandated by the government would not get all the documents and the collaboration it needs to get the job done properly. Government officials argued that access was limited because of the access to information law. In Canada, the data were the property of the petitioner, the only one authorized to grant access. Its application, it seemed, denied access even to those mandated by responsible ministers to inquire on the issue.

But, according to MacKenzie, the government did have some leverage to improve access to information "without jeopardizing trade secrets or competitive advantages." Firstly, he argued that many of the GM products had been approved in other countries that "practice broader disclosure than Canada". Secondly, the public interest could be invoked to override the Access to Information Act. And finally, agreements could be negotiated with companies to disclose safety data prior to a regulatory decision, an

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[95] Heather Scoffield, « Officials blast food-safety report, » The Globe and Mail, 6 February 2001, A9.

[96]Dennis Bueckert, « Aliments transgéniques. Ottawa défend sa politique d'examen, » La Presse, 6 février 2001, A4.

approach, according to MacKenzie, that was generally supported by the industry.[97] This latter approach was later explored by CFIA.

In November 2001, some eight months after publicly rejecting and discrediting the Royal Society Report, the government replied by way of an Action Plan that it claimed was a response to the Royal Society Report.[98] But to some, it was just an occasion to forward the recommendations of August 2001 CBAC interim report on the regulation of genetically modified foods.

> *"You are probably aware that the Royal Society came out with their report – while the government was thinking about how to respond, we came out with our report which, in many cases, broadened or provided some context for some of the scientific advice that the Royal Society offers. When we saw the response of the Royal Society, many of the things they were advising weren't actually responding to the Royal Society per se but were taking suggestions we had or observations we had and in some way trying to capture the essence of them and apply them into the regulatory system to make it more predictable, and transparent, and accountable. Much of which wasn't even recommended by the Royal Society but for purposes of accountability, the government chose to look, respond to the Society rather than to inter-advice from us."*[99]

The action plan targeted issues that were indeed raised by the Royal Society panel, but, incidentally, also by the CBAC interim report: substantial equivalence, the use of precaution, transparency and public confidence, potential human health impacts, environmental safety and GM plants, and GM-animals and GM feeds. Again preferring to rely on CBAC for advice, the government recognized, in its Action plan, the importance of addressing economic benefit and cost, ethical questions as well as environmental impact but pledged it would "consider them in the near future, once the Canadian Biotechnology Advisory Committee releases its final report on the broad issues."[100]

The Action plan was in an implementation phase during 5 years and abolished in 2005 after eight progress reports had been published. Many of the changes that were carried through were in continuity with the already underway elaboration of the

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[97] Donald J. MacKenzie, Analysis of Relevant Canadian Legislation, November 2000.

[98] Government of Canada, Action Plan of the Government of Canada in response to the Royal Society of Canada Expert Panel Report (Ottawa: Health Canada, November 23, 2001).

[99] X, CBAC, interviewed by author, 15 Marsh 2002.

100 Government of Canada, Action Plan ...in response to the Royal Society of Canada ... Report, 10.

regulatory framework, mainly with Health Canada pledging to make changes to its *Guidelines for the Safety Assessment of Novel Foods derived from Plants and Microorganisms or* the revision of the *Guidelines for the Safety Assessment of Novel Foods derived from Plants and Microorganisms*. The government agreed that, in the future, there would be a "need to further refine and contribute to the elaboration of effective and appropriate application of substantial equivalence in the evaluation of more complex GM-foods and GM-organisms... »[101] but denied there was any problem with the way the substantial equivalence criteria had been used so far. In its view, the problem was that the concept had been defined somewhat differently across departments. For the government, the problem was also informational: information material thus had to be reviewed to better explain the concept of substantial equivalence and familiarity to the public: "*The CFIA is reviewing its fact sheets on the assessment process to improve clarity and explanation of the concepts of familiarity and substantial equivalence. The Agency is also preparing new information for posting on the Internet and use in CFIA information kits to explain the use of substantial equivalence and other concepts in its regulation of agricultural products*."[102]

Concerns for more public consultations and more transparency were addressed but only partially answered by the Action plan. The government kept conducting targeted and specialized consultations for every regulatory amendment. Otherwise, this concern for more transparency mainly took the form of a study of other countries' approach to develop a Canadian model for transparency and consultations. [103]

The work seemed well underway for improving transparency with a pilot project which consisted in posting notice of submission for public comments prior to the examination and decision. However, in 2005, only six notices had been posted. Using a voluntary approach, Health Canada's and CFIA's evaluators had to work with every petitioner to encourage them to make their notices of submission public.

Another project, consisting in allowing the participation of external experts to The Food Ruling Committee meetings, was still a pilot project in June 2005: "*The Food Directorate continues to move forward with the Pilot Project on External Expert Participation at Food Rulings Committee meetings. The first Food Rulings Committee*

[101] Action plan, 12.
[102] Ibid., 12.
[103] Health Canada, the Canadian Food Inspection Agency (CFIA), Agriculture and Agri-Food Canada (AAFC), Environment Canada and Fisheries and Oceans Canada, Action Plan ...Progress Report (Ottawa: Bureau of Food Policy Integration, Health Canada June 2005), 5.

discussion of the safety assessment of a genetically modified food with the participation of an external expert is expected to occur toward mid-2005." [104]

In sum, the government did not hesitate to engage NGOs and departments in lengthy discussions on how to improve transparency and public participation all the while pursuing its regulatory policy with a lot more celerity. In 2005, it is most likely that such pilot projects would not have changed much to the fact that already many GMOs had been approved in Canada. The government was only saving time and securing for itself a way out in case of controversy: in which case it could claim that something had been done.

6.5 Conclusion

In Canada, the Federal Regulatory Framework for Biotechnology and its implementation has to be contextualized within a movement toward more cost efficient regulation. These efforts to "regulate smarter" would, it was hoped, contribute to economic growth and job creation by improving government management, by removing obstacles to growth, and by encouraging private initiatives. Although the regulatory reform included elements to strengthen the role of the parliament and to improve public consultation and information mechanisms, there was a clear sense that economic aspects and competitiveness would take precedence over other considerations.

In 1994, as part of the Federal Regulatory Reform Agenda, biotechnology was identified as one of six sectors of priority to improve regulatory efficiency in order to foster competitiveness, job creation and growth. The evolution of the regulatory framework for biotechnology product and the public discourse was clearly influenced by this vision that did not leave room for the expression of health, environmental or ethical risks considerations but that emphasized greatly economic risks related to a loss of competitiveness. During the review process of the Canadian Environmental Protection Act (CEPA), it became clear that the Canadian government was not only trying to conciliate economic and environmental principles of sustainable development, it was also subjecting environmental goals to commercial objectives. Consequently, the regulatory choices that were made for biotechnology had to be in line with this general idea of "competitive regulation". An examination of Regulatory Impact Analysis Statements (RIAS), prepared for biotechnology related regulatory amendments between 1995 and 1998 showed that environmental, health or ethical aspects were indeed left out of the

[104] Action Plan ...Progress Report, 7.

cost-benefit analysis while a great concern was given to economic impacts and market access.

The January 1993 principles for a more efficient regulatory framework for Canadian biotechnology were to contribute to prosperity and well being by fostering a favourable climate for investment, development, and innovation. It was to use existing legislation and regulatory institutions; no new act was to be adopted. But the impact of the choice to build on existing laws and regulations was threefold: Firstly, because it contributed to make it look like ordinary business, it did not attract the attention of the media since nothing new, it seemed, was going on: no new law, no new regulatory authority, and apparently, not even a new technology since the legal definition of biotechnology in Canada included both old and new products of biotechnology. Secondly, it kept the debate at a very technical level with the consequence of excluding *de facto* new and less informed players. Finally, it preserved the complexity of the legislative framework, the "legislative maze", which industries once decried but that also contributed to keep newer and uninformed players away from carrying out a close investigation of the processes involved.

In Canada, biotechnology regulations in the 1990s continued to be mainly the business of the public administration. A lot was still done informally and modifications to the regulatory framework went mainly in the direction of formalising what was done informally. Besides, with no new law to be examined, the parliament was kept out for the most part. Early regulatory adjustments mainly confirmed the competence of Agriculture Canada over environmental assessments of agricultural GMOs. Those were achieved rather quickly and without much publicity. Discussions concerning regulating novel foods and the CEPA equivalency clause, on the contrary, were long and requested the participation of a large group of actors to repeated consultations. Final decisions concerning the equivalency clause in CEPA took so long that the outcome most likely convinced some parties of the uselessness of their participation which had, in the end, only resulted in draining some of their scarce time and financial resources. In fact, decisions on the equivalency clause were delayed until AC was formally put in charge of environmental assessments. Despite important mobilisation of NGOs against the changes to the equivalency clause, Canadian authorities kept claiming that their actions were backed by a strong consensus, thus implying that those who still did not agree with the approach represented a marginal and isolated faction.

All through the regulatory adjustments described in this chapter, the Canadian government has been very successful at mastering institutional risks and keeping a hegemonic hold on the discourse, ignoring criticisms and allegations that it was favouring industries at the expense of the population's safety, giving less than little exposure to opponents by ignoring them. It left no space for public discussions of risks other than economic impacts and market access. The Canadian government used RIAS statements as well as the CFIA website to continue downplaying risks, emphasizing benefits and

even discrediting competing approaches to regulating GMOs. When it came to adjusting regulations, the government simply acted as though opposition did not exist, ignoring reports and recommendations that did not support its regulatory orientations or that would lead to open discussion about risks. When the recommendations of the Royal Society Panel became the center of attention, the government went as far as possible to discredit the panel of experts.

Finally, the structural characteristics of the evaluation process also greatly increased the capacity the government had to control the discourse. In the Canadian system, the data used for risk assessment of biotechnology products are the property of the firm who provides it and no access can be granted without their permission. Since CFIA and Health Canada did not conduct their own experiments, access to assessment data was quasi impossible for external reviewer if the petitioner did not authorize access. Only experts within the public administration and working on those assessments could credibly have a say and only they knew for sure how these products were evaluated on a case by case basis.

Regulatory changes described in this chapter were not the object of public controversy, a factor that has certainly helped the government to keep control over the debate and allowed the government to dodge blame before they became institutional risks. When some aspects of the debate became the object of public controversy, the government had to adjust its strategy to face what could have become significant institutional risks. The next chapter examines two of the main public controversies over GMOs in Canada: the debate over mandatory labelling and attempts to authorise recombinant bovine growth hormone (rBST) in milk production in Canada.

CHAPTER SEVEN

Managing Controversies in Canada: The Cases of Recombinant Bovine Somatotropine and Labelling.

The description of the regulatory context and the regulatory evolution in Canada only tells part of the story about the forces and influences that were at play when it came to deal with opposition to biotechnology. The press review revealed the great influence of the Confédération paysanne on the discourse in France. In Canada, no similar opponent was able to take the lead in the media. To understand the forces controlling discourse in Canada, one also has to understand how some of the most significant opposition movements to biotechnology were overcome by governmental strategies.

In Canada, between 1994 and 2002, there were two main public controversies over GMOs. The first one had to do with market introduction of recombinant bovine somatotropine (here referred as rBST); the second concerned mandatory labelling. Telling the stories of rBST and labelling in Canada serves to illustrate how the Canadian government reacted to opposing views and institutional risks by trying to control and marginalize the influence of rival opinions. Both stories also reveal some of the particularities of Canada's social and institutional risks definition and management.

The story about recombinant bovine somatotropine (rBST) in Canada shows how important allegations of mismanagement and possible corruption were dodged by refusing rBST and promising that changes would be made to Health Canada's drug approval process. The story of the fight for mandatory labelling, in turn, shows how ignoring a movement and buying time with symbolic measures and consultations can create a policy lock-in that plays in favour of the status quo. In both cases, a public relations approach was used to publicly deny any problem. Even though, in both cases, very serious criticisms were expressed as to the government's ways and intentions, sometimes from within Canadian parliamentary institutions, the government succeeded in keeping control of the discourse by making sure that those opposing its views would find their message lost and wasted in useless consultations. For a long while, press coverage that focused principally on business news and covered policies and regulations rather superficially did the rest to keep the issue out of the public eye..

7.1 The Story of Recombinant Bovine Somatotropine (rBST)

In the early 1990s, the issue of recombinant bovine somatotropine (rBST) was the cause of one of the first Canadian controversies about biotechnology. This product of genetic engineering, a synthetic hormone, was developed to increase milk production in cows by 15 to 25%. It became a center of attention when, in 1990, it became publicly known that milk from cows treated experimentally with rBST had been mixed and sold with regular milk at a very early stage of experimentation in 1984 in Ontario and in 1985 in Quebec.[1] In fact, as early as 1984, and without informing consumers, the Office of Veterinary Drugs of Health Canada had concluded, before any decision had been reached concerning the impact of the hormone on animal health, that the milk produced by cows treated with rBST did not pose any health problems for humans.[2]

Some experts at the time were of the opinion that information concerning the safety of rBST for humans and cows was incomplete and that regulatory authorities should not have authorised the sale of this milk on regular markets. While Health Canada seemed to be comfortable with the situation, Dagenais reported that the scientific community still had some relevant questions about the impact of rBST on human health. Among others, some were concerned by the scarcity of information concerning indirect effects of rBST, such as the impact of the increase of IGF-1 produced by the cows' liver. Very similar to the human type, IGF-1 was suspected to be potentially "mitogenic" with potential impact on bones, heart and intestines of consumers if it could find its way into cows' milk. Furthermore, there were still a lot of unknowns about the impact of IGF-1 on children's immature digestive systems. [3] Dagenais's report also raised questions about the real efficiency of rBST, its impact on animal health and economic advantages for farmers.

Endorsed by the *Fédération nationale des associations de consommateurs du Québec* (FNACQ), the recommendations of the Dagenais report asked that, in the future, consumers be informed of ongoing experiments; that they be given the opportunity to intervene in R&D decisions; that they have a say in the determination of required proofs

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[1] Richard Dagenais, Droit des consommateurs face aux produits des nouvelles biotechnologies (Ste-Foy: Université Laval et ACEF de Québec, juin 1992), 2.

[2] Richard Dagenais, Les biotechnologies et les consommateurs. Le cas de la somatotropine bovine (STB), rapport de la Fédération nationale des Associations de consommateurs du Québec, mars 1994.

[3] Dr. Ben Mepham, The Veterinary record, Marsh 7, 1992 and The US National Institute of Health, Technology Assessment Conference Statement on BST, 5-7 December 1990, both reported in Dagenais, Droit des consommateurs … 4-5.

of health and environmental safety; and that socio-economic, ethical and environmental impacts be part of the evaluation.[4] They also asked for mandatory labelling in order to preserve consumers' right to be informed, a position they were to consistently defend through the years.

In February 1994, after the market introduction of synthetic bovine somatotropine (rBST) in the USA and concerned with the imminence of sale of rBST in Canada, the House of Commons Standing Committee on Agriculture and Agri-Food requested the Minister of Health to delay her decision in order to allow the Committee to study the issue. A series of meetings were held by the Committee in March 1994 and experts, farmers' representatives, consumer groups and public officials from concerned departments were invited to give their opinions on the topic.

The subsequent report on rbST was significant because it was the first time a parliamentary committee criticized so openly the regulatory process for biotechnology products in Canada. In studying the issue, the Committee brought the issue of risk to the forefront. To that point, the official governmental discourse on biotechnology had concentrated much on biotechnology as a boost to economic prosperity and as a solution to environmental problems. The Standing Committee provided a forum for discussing not only health related risks but economic and social risks as well. And their report openly questioned the capacity and the willingness of authorities to regulate biotechnology products properly. Members of the Committee also questioned the scope of the evaluation done so far and they underlined the lack of transparency and coherence of existing regulatory arrangements. They brought some attention to the fact that guidelines were not ready yet to help assess such products and that expertise might be lacking within departments in charge of evaluating these products.

In its report to the Parliament, the Committee expressed its concerns that all relevant factors were not taken into account in the decision making process and that regulators depended on company-derived data for product evaluation. It made a recommendation to the effect that the federal government make provision for "assessing the possible socio-economic and environmental effects of biotechnology products that might affect human or animal health, or the environment." In addition, members of the Standing Committee asked that a one-year moratorium be used to look at socio-economic issues and to review in greater detail the impact of rBST on animal health, animal

[4] Richard Dagenais, Synthèse du rapport de recherche sur l'hormone de croissance bovine (STB) et son expérimentation au Québec et ailleurs (Montréal : Fédération Nationale des Associations de Consommateurs du Québec, juin 1992), 11-12.

genetics, human health, and consumer reactions in the USA. A special task force was created to pursue the work.

The Committee also raised the issue of transparency in decision-making and lack of coherence and confusion between departments sharing responsibilities. "The Committee recommends that Health Canada and Agriculture and Agri-Food Canada together establish consistent procedures for handling biotechnology products under their jurisdictions."[5] Members of the Committee pleaded in favour of more transparency of the decision process. In particular, they recommended that "Health Canada develop better mechanisms for keeping parties informed about new products under review."[6] As a way to increase public confidence in the regulatory system, they also suggested the creation of a committee of experts that would include more stakeholders.

The Standing Committee launched this inquiry for a product that was supposed to open the way to other biotechnology products. Somatotropine was presented as "the first publicly visible choice" that was supposed to demonstrate public acceptance of these products. But even more embarrassing for the Federal government was that conclusions of the inquiry were reached at the same time as rBST was about to receive approval by Health Canada after a lengthy evaluation process that had been taking place since 1986. It looked a lot like a disavowal of the drug evaluation methodology and process used so far by Health Canada. Opponents soon organised a campaign to extend the rBST moratorium.

Because this report was questioning the very capacity and willingness of the federal government to do proper evaluation of these new products, it could have had an important impact on the public. Press coverage, however, was such that these aspects of the problem were covered either superficially or simply not brought to the attention of the readers.[7] Perhaps because of the complexity of the regulatory framework, very little if anything was said, and much less explained, about the way these products were regulated. In the newspapers examined for this study, only one article echoed specific worries concerning health effects.[8] In contrast, articles often ended with a questioning of the

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[5] Standing Committee on Agriculture and Agri-Food, rbST in Canada (Otttawa: the Committee, April 1994), 10.

[6] rbST in Canada, 9.

[7] In *La Presse* as well as in *The Globe and Mail*, this issue was at the time the object of a relatively small number of articles (3 articles in the *Globe and Mail* and 5 in *La Presse* between February 1994 and August 1994). The Committee's audit were being reported as being done to avoid public controversy and only the recommendation of the one-year moratorium was the object of some attention. See appendix 3 for details.

[8] « Production laitière: une hormone inquiétante,» nouvelles générales, La Presse, mercredi 27 juillet 1994, sec. A, p. 9.

impact of a negative decision on the young Canadian biotechnology industry. Although these reports were a source of embarrassment for the government, they did not succeed in creating an important public controversy and the government was still openly supportive of the biotechnology industry.[9]

7.1.1 Delaying the decision

From the 1994 inquiry by the House of Commons Standing Committee on Agriculture and Agri-food and subsequent report of the Special Task force in 1995 to the final decision of Health Canada not to approve the sale of rBST in Canada in January 1999, opponents and promoters were kept on the *qui vive*. This matter was mostly opposing consumer and citizen associations to the industry that considered the introduction of rBST as crucial to the future of the biotech sector. Farmers were, in contrast, deeply divided on the issue. The argument according to which the introduction of rBST into milk production processes would decrease milk consumption had led Canadian milk producers to avoid taking a position. They requested more investigations of the issue and more consumer information before any decision was taken. Contrary to their US counterparts, Canadian farmers never clearly supported regulatory approval of rBST, a difference that could partly explain the hesitation of Health Canada to approve the product.

Occasional "off the record" hints, in 1995 and 1996, from Health Canada officials that a decision was imminent contributed to keep opponents alert.[10] However, years were passing during which the chief regulator at Health Canada was refusing to make a regulatory decision. While holding-up this decision had the effect of deferring probable public controversy over biotechnology, it also led to criticism of Health Canada for its inaction: *"Most observers on both sides of the issue, including much of the Canadian press, dismissed Health Canada's inaction on the rBST issue as political timidity attempting to mask itself as scientific objectivity and caution. Academic commentators denounced Health Canada for abdicating its responsibility for effective risk*

[9] Ralph Goodale, then minister of Agriculture, was reported to have warned that, whatever might be decided about rBST, the government had to be careful not to impair the nascent Canadian biotechnology industry which held tremendous potential for the future of agriculture. In « Une hormone synthétique risque de provoquer une controverse au Canada, » La Presse, jeudi 10 mars 1994, sec. A, p. 8.

[10] Douglas Powell, « Lost in Regulatory Space: RBST, » in Mad Cows and Mothers Milk, ed. Douglas Powell and William Leiss (Montreal: McGill-Queen University Press, 1997), 137-138; R. Steven Turner, "Of Milk and Mandarins," Journal of Canadian Studies vol. 36, no. 3(Fall 2001): 113.

communication with the Canadian public…"[11] However, argued Turner, internal dissension between the Health Protection Branch and the Bureau of Veterinary Drugs had been the reason the decision was delayed.[12] This climate of dissension was soon at the origin of a scandal that attracted much negative attention to Health Canada's drug approval process.

To this point, according to Turner, the debate had been contained inside the circle of interested and informed players. The media had been covering the issue without any special attention and the controversy over human and animal health issues had been largely kept quiet.

> *"The rash of parliamentary hearings, task force proceedings and moratoria of the mid-1990s had mainly concerned economic stakeholders; the discussion of health or environmental risks from the product had been muted; all parties seemed to anticipate eventual regulatory approval; and except for Health Canada's interminable delay in making a decision, little blame had so far attached to government handling of the issue. But all this was about to change."*[13]

7.1.2 Managing dissenting views within Health Canada

The federal government soon started to come under more pressure as a series of events led to questions about the integrity of the Health Canada drug evaluation process and allegedly important managerial problems. In the summer of 1997, Canadian milk producers publicly showed that they mistrusted authorities when they officially and publicly asked that, before rBST was approved, the Auditor General of Canada should examine the review process. They wanted the safety of the product to be confirmed by international organisations and they pushed for Health Canada to explain more fully to Canadians the process and rationale it had used thus far to evaluate the product.[14]

A few months later, in January 1998, as a result of internal conflicts and dissenting opinions from the human safety branch of the Bureau of Veterinary Drugs on the impact of rBST on human health, Health Canada was pressed by its own experts to establish an

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[11] Turner, "Of Milk and Mandarins," 114.
[12] Ibid., 114.
[13] Ibid., 117.
[14] Presse Canadienne, « La somatotropine recombinée inquiète, » La Presse, mardi 15 juillet 1997, sec. A, p. 14.

internal rBST Review Team to conduct an analysis to determine if gaps existed in the scientific documentation relative to the human safety of rBST. *According to Turner:* "*Led by Shiv Chopra, [these scientists] pressured the bureau managers to set up an internal team of scientists to re-examine the data on human safety and determine whether there had been procedural and scientific gaps in the earlier reviews*."[15]

Two gaps analysis reports were produced and submitted in the period from April to July of 1998. The first report (April 21) was the product of the entire team. The second was from two of the four members of the Review Team. Both reports were anticipated to make up for the dissension within the department and were intended to be dealt with internally. It was argued that they included information protected by the Access to Information Act and the Privacy Act about the company that filed the demand and thus had to remain private.

As if no possibility to reach a decision within its walls was possible, Health Canada also concurrently commissioned two external independent expert panels to evaluate the question. One was to be created by the Canadian Veterinary Medical Association and the other by the Royal College of Physicians. But according to a former senior scientist at Health Canada, the rationale behind the decision to appoint an external committee after so many years of being unable to reach a decision was simply to regain control over the coming decision:

> *"When one file goes to one desk to another without ever getting to be approved, it means that the direction removes it from the person whom they think will not grant approval to give it to someone whom they think will approve it. When that process is exhausted, you hire outside committee. You naturally, having exhausted your own internal staff, are not going to go to the external world and get fair, honest, impartial people."*[16]

It seems this impression was becoming pervasive within the population. These measures were not enough to calm increasing public awareness. On 5 May 1998, "the

[15] Turner, 115.
[16] X, former Health Canada scientist, interviewed by author, Ottawa, Canada, 24 April 2002.

Senate of Canada unanimously passed a motion urging the government to defer licensing recombinant bovine somatotropin (rBST) for at least one year and thereafter until the long-term risks to public health were known."[17] In June, the Standing Senate Committee on Agriculture and Forestry initiated public hearings to study the issue of health and safety effects of rBST use on humans and animals. But the Committee went further, addressing not only health issues surrounding rBST but also the drug approval process and management issues within Health Canada.[18] The Senate had been pressured by farm associations but also by public opinion. The first public controversy about biotechnology in Canada was about to intensify.

> *"The reason they did [these meetings] was they [the members of the Standing Committee] said they had never received so many letters about a single issue but not chain letters. They received letters from such a huge variety of people from all over the country that they decided to hold their hearings. And I think it was a catalyst. I think it worked people up to the whole biotech issue. I think it hasn't died down again since. So I don't think there's anything as quite as controversial as rBST itself."*[19]

The handling of somatotropine by the Bureau of Veterinary Drugs was only starting to be an embarrassment for Health Canada and its minister, Alan Rock. Parallel to these parliamentary hearings, the press soon reported that six Health Canada scientists having participated in the editing of the Gaps reports "approached a labour board in mid September with allegations that they were being pressed by superiors to approve the drug", which had been under review by the system.[20] They also accused the department of having hidden evidence about the dangers of rbST.[21] Some of these allegations were put before the Public Service Staff Relations Board which could not conclude that undue pressures had been put on those scientists but which was also not capable of judging the scientific aspects of the complaint. Whistle blowers were however invited to testify before the Senate Committee which, in turn, did not get full collaboration from Health Canada.

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[17] Standing Senate Committee on Agriculture and Forestry, rBST and the Drug Approval Process, Interim Report, March 1999

[18] Standing Senate Committee on Agriculture and Forestry, rBST and the Drug Approval Process, Interim Report, March 1999

[19] X, Industry Canada, interviewed by author, Ottawa, 22 February 2002.

[20] Nahlah Ayed, "Scientists take their concerns to Senate [agriculture committee]," Canadian Press Newswire, (October 22nd 1998).

[21] Lori Kittelberg, "The Scientists who Took on Health Canada [Senate Agriculture Committee...]," Hill Times, (461) October 26th 1998).

The Committee started its work on June 4 1998, but it took 10 weeks before it was provided with a copy of the Gaps Analysis Report – a copy amputated of approximately one-third of its content and a copy that did not include information already released to individuals who had made a similar request through the Access to Information Act. In contravention of the rules of the Senate, it took nine months before the Committee finally received the complete documents from Health Canada.[22]

> *"In the Committee's opinion, the department had removed information that need not to have been removed under the Access to Information Act. In particular, it had deleted some information that had been in the public domain since 1990, and failed to provide to the Committee some information that had been made available to individuals outside the department."*[23]

Conclusions of the Gaps report raised important doubts about the evaluation process and standards. The report was critical of the fact that "the usually-required long-term studies to ascertain human safety were not conducted," and that "such possibilities and potential as sterility, infertility, birth defects, cancer and immunological derangement were not addressed." [24] It denounced the fact that the only short-term toxicology study conducted by Monsanto was improperly reported and that Health Canada had agreed with the manufacturer's claim that long-term study of BST effects in humans was not necessary.[25]

Conclusions of this analysis were troubling and shed doubt on the very willingness of the authorities to conduct reviews that were in the best interest of the population. The Gaps analysis reports were especially embarrassing for not only did they question the process, but also they questioned the integrity of some department officials and pointed to "unauthorized influence against subordinate staff" and "personal conflict of interest". [26] The testimony of the scientists before the Senate Committee raised further questions about the industry's influence on the drug approval process and possible conflicts of interest. There were suggestions of pressure, coercion, document theft and gag orders.

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[22] Standing Senate Committee on Agriculture and Forestry. rBST and the Drug Approval Process. appendix3.

[23] Ibid., appendix 3.

[24] Shiv Chopra, M. Feeley, G. Lambert and Then Mueller. rBST (Nutrilac) "Gaps Analysis" Report, 21April, 1998.

[25] Ibid.,

[26] Ibid.,

In January 1999, just as the Senate Committee was about to table a report, and some 6 months before they were expected to be released, the two external independent expert panels presented their report. Their conclusions were that recombinant bovine growth hormone was safe for humans but could represent increased health risks for cows. Shortly after this release, and although the essence of the controversy was related to risks to human health, Health Canada announced its decision not to approve rBST on the basis of the animal-health panel findings.

This decision could have been the end of the controversy but, as argued by Turner, those who were against rBST for human health reasons felt they had won for the wrong reasons and there was still a fear that Monsanto would later try to get its product approved.[27] Supported by the public, the Senate Committee that some had expected to end its inquiry after the refusal of Health Canada to grant notice of compliance to Monsanto's rBST decided to continue its investigation on the matter.

Starting in the fall of 1998, the media contributed to publicize the issue but the coverage was still of moderate intensity. There was, in the Globe and Mail, a clear editorial bent in favour of the government and rBST approval.[28] The decision of the Standing Committee to pursue the work in January 1999 was portrayed as petty politics at the farmer's expense.[29] In fact, the press attacked their decision to pursue the inquiry with such vehemence that the co-chair of the Committee felt he had to answer back publicly.[30]

The Committee received testimonies that rBST was atypically handled and highlighted the lack of immediate competence and industry links of some directors of the Bureau of Veterinary drugs.[31] The very integrity and the "raison d'être" of the Royal College of Physicians' expert committee which had reached the conclusion that rBST did not cause any threat to human health was also questioned. Hearings brought forward

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[27] Monsanto indeed publicly announced his intention to fight back. See Anne McIlroy, « Drug-approval process flawed, rejected hormone maker says," The Globe and Mail15 January 1999, sec. A, p. 3.

[28] "The Drama in cow's milk," editorial, The Globe and Mail 19 septembre 1998, sec.D, p. 6; "We'll get it when the cows come home. Why is it taking so long to approve the BST hormone?" Editorial, The Globe and Mail 22 December 1998, sec. A, p. 26.

[29] "The science of cows, the madness of politics. Who needs cheap, safe milk? Not us, we're Canadian," Editorial, The Globe and Mail 15 mai 1999, sec. D, p. 6.

[30] Eugene Whelan, "Why I am resisting the push for rBST in cows," Letter to Editor, The globe and Mail. January 12 1999, sec. A, p. 19. See also press review.

[31] See testimonies of Margaret Haydon and Shiv Chopra. In Standing Senate Committee on Agriculture and Forestry, Proceedings (Ottawa: the Standing Senate Committee on Agriculture and Forestry, Monday May 3 1999), issue 35, evidence.

flaws and contradictions in the conclusions of the human safety panel[32] and alleged conflict of interest of one of its members.[33] Senate hearings were also the first time authors of the gaps analysis report and members of the expert panel on human health were able to present their views in public and have them debated face to face.

These events raised questions about the transparency, independence and the quality of the review process and the capacity of Health Canada's *Bureau of Veterinary Drugs* to conduct such a review. It pointed to undue industry access to the decision process. It was assumed that the industry-led Canadian Animal Health Institute, which had participated on the Joint Program Advisory Committee (JPAC) that contributed the elaboration of regulatory guidelines, had access to the names of evaluators within HC.[34] In the opinion of a former Health Canada scientist, this was a case of one way transparency where the system was closed to public scrutiny but very much open to industries.[35]

Even though the Committee continued to investigate the issue after March 1999, with the intention to call HC officials to testify on measures adopted to solve internal managerial issues, no final report was produced. The parliament was prorogued in September 1999, which did not allow the Committee to complete its work. Had it not been for an interim report tabled in March 1999, the work of the Standing Senate Committee would have gone to a waste. The interim report recommended that Health Canada closely respect conflict of interest guidelines, carry out an investigation of its drug approval process, and that Health Canada should explore means to consult the public and encourage open public discussion on economic, trade, social and ethical aspects. The Committee also reminded Health Canada that information requests by a parliamentary committee should be answered rapidly and completely:

> *"…, the Committee experienced difficulties in receiving information from Health Canada. Believing that parliamentary committees require complete information to carry out their responsibility to Canadians, the Committee recommends that federal departments fulfill information requests from committees*

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[32] Standing Senate Committee on Agriculture and Forestry, Proceedings, Monday April 26 1999, issue 33, evidence .

[33] Standing Senate Committee on Agriculture and Forestry, rBST and the Drug Approval Process, Interim Report (Ottawa: the Standing Committee, March 1999), Section B, "The process and rBST".

[34] Standing Senate Committee on Agriculture and Forestry, Proceedings, Monday April 26 1999, Issue 33.

[35] X, former Health Canada scientist, interviewed by author, Ottawa, Canada, 14 April 2002.

> *completely and as expeditiously as possible, with proprietary information presented to committees in camera."*[36]

Health Canada pledged that management issues were already being considered within its three-year review of the health protection program, a plan to conduct nation-wide extensive consultations with Canadians and the renewal of legislation: *"Extensive nation-wide consultations with Canadians from all walks of life are now underway and are an integral part of the three-year transition process which also includes renewal of 22 pieces of legislation, many of which are outdated, governing health protection in Canada today. Health Canada is committed to a modern, transparent and efficient health protection program."*[37] It concretely led to the creation, in 2000, of the Office of consumers and public involvement within Health Canada to encourage participation of the public through pan-Canadian consultations. In 2002, in practice however, it was still looking for a functioning mode and a process for actors' identification.[38] It has never been used for biotechnology issues because the newly created CBAC had been given responsibility to establish a dialogue with the public.

Health Canada scientists who had testified about wrongdoings within the agency were still, as of June 2002, claiming that they were pressured to pass or maintain some veterinary drugs without the required proof of human safety and were facing reprimand from the Department.[39] Chopra, Haydon and Lambert were fired from Health Canada a few years later in 2004.

From the early 1990s to 1999, recombinant bovine somatotropine had started as a case for biotechnology products but ended as a case about Health Canada procedures and managerial difficulties. In 1994, the hearings by the House of Commons Standing Committee on Agriculture and Agri-Food had made it a case for better regulation of biotechnologies in general. But given that the controversy over GMOs had increased worldwide, no pro-biotechnology actor was interested any longer in reminding the public about a link between rBST and biotechnologies. The Senate Hearings in 1998 and 1999 mainly focused on the handling of rBST and managerial difficulties within Health Canada. Biotechnologies were not a specific target of their report and rBST was not explicitly identified as a case of biotechnology application. If it created some pressure for

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[36] Standing Senate Committee on Agriculture and Forestry, rBST AND THE DRUG APPROVAL PROCESS, March 1999, executive summary.

[37] Health Canada, "Health Canada re-iterates position on rBST Review," News Release 1998-75, October 21, 1998.

[38] X, Health Canada's Office of Consumer and Public Involvement, interviewed by author, Ottawa, Canada, 24 April 2002.

[39] Dr. Shiv Chopra, Letter to Public Service Integrity Office, 4 June 2002.

change within the agency and for the drug approval process in general, it did not directly create pressures for change in other approval processes used for other biotechnology applications. Once the use of rBST was rejected, the story was quickly dropped by the media without much harm done to the legitimacy of biotechnologies in general.

7.2 The Labelling of GM Food and Food Ingredients in Canada

7.2.1 Canada's Early Position on Labelling

In 1993, the Canadian government had started its work and was consulting to elaborate an official position on labelling of GMOs to be defended at the Codex *Alimentarius* Commission. The outcome was the production, by Agriculture and Agri-Food Canada and in the name of the Canadian government, of a draft position to be defended at Codex. This proposal included four guidelines:

1) only health risks and important changes of composition and nutritional value (in relation to traditional food) should appear on the label of novel foods from genetic engineering;
2) unless it represents a danger for health, safety or an important change in the composition or nutritional value of the product, it should not be mandatory to mention that a given food was the product of genetic engineering – thus implying that voluntary labelling could be acceptable;
3) labelling should be easy to understand, information on the label should be true and not misleading;
4) finally, meeting with religious requirements should not be part of the government's mandate.[40]

But opposition was already getting organised. The FNACQ, which had been active on the rBST case, was among the participants at the workshops organised in 1994 to prepare the Canadian position at Codex. Its position summarizes the essence of the argument in favour of mandatory labelling. For FNACQ, directing consumers toward additional sources of information could not have the same impact as labelling because these sources did not specifically target products, were not within the reach of every

[40] In this proposal, the government also argued that, if consumers wanted to be informed, they could go to other channels such as 1-800 lines, the mass media, etc.

consumer and did not truly support the consumer's right to choose. It was also argued that to reject mandatory labelling denied consumers the right to choose in accordance with their needs and values. And it was undemocratic because it took away the power consumers have when they are buying certain products instead of others because buying decisions, in the end, can be a manner to support certain types of products or production means. Without proper labelling, how could consumers indicate they disagreed with GM foods? Furthermore, voluntary labelling, they argued, would mainly serve the interests of manufacturers more than that of consumers. Since no segregation was in place in Canada to separate GM and non-GM crops, voluntary labelling would be relevant only for a very small portion of the products, mainly for organic farming.[41] Those voluntarily labelling their product as "GM-free" would end up bearing the burden of proof.

But FNACQ also argued that the consultation process that had led to the official position was improper.[42] They contradicted the government's claim that the Canadian position was the result of consensus building; that it was the result of "a series of consultations with a wide audience of interested participants" and that some general consensus emerged from these steps.[43] According to the FNACQ, despite the fact that the government claimed that many public consultations had been done, only one had really taken place.

> *"On déclare dans le document de consultation que les lignes directrices découlent d'un certain nombre de points de consensus général qui sont ressortis d'une première série de consultations, menées au Canada, sur le sujet. On parle de plusieurs consultations publiques alors qu'en réalité il n'y en a eu [sic] que deux consultations au Canada où les différents intervenants canadiens ont pu donner leur opinion sur le sujet soit : en novembre 1993 et en novembre 1994; cette dernière constitue en fait la seule véritable consultation portant spécifiquement sur la question de l'étiquetage des aliments nouveaux issus du génie génétique. La réunion d'octobre 1994 ne peut-être considérée comme une consultation publique canadienne, puisque c'est une discussion entre pays membres du CODEX. »*[44]

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[41] Fédération nationale des associations de consommateurs du Québec (FNACQ), Position et commentaires de la FNACQ, Janvier 1996, p. 5-6.

[42] Fédération nationale des associations de consommateurs du Québec, Janvier1996.

[43] Agriculture and Agri-Food Canada, "Labelling of Novel Foods Derived Through Genetic Engineering," Press Communiqué, 1 December 1995.

[44] Fédération nationale des associations de consommateurs du Québec, Position et commentaires de la FNACQ, Janvier 1996, p. 2-3

In this same report, the FNACQ also disagreed with the claim that consensus was reached on many issues during these consultations. To them, diverging positions were expressed but eventually ignored or not taken seriously by the government. Besides, they stressed that NGOs were not represented adequately in these workshops, with a majority of participants from the government (38.6%) and business (37.1%) and only 14.3% of participants from NGOs. NGOS, they argued, had the feeling of having been betrayed in the process.[45]

This dispute did not attract much media attention and did not stop the government from continuing to claim that the Canadian position on labelling was the fruit of consultations. The Canadian Food Inspection Agency was still claiming in 1998 on its web site that three consultations had taken place since 1993 and that these had led to a consensus and the adoption of a series of guidelines.[46]

7.2.2 Renewal of the Biotechnology Strategy

The renewal of the Canadian Biotechnology Strategy in 1998 could have been another occasion for advocates of mandatory labelling to be heard but the Task Force and the NBAC never made it a point to be discussed. On the contrary, working documents suggested to stakeholders that a broad consensus had already been reached in favour of mandatory labelling limited to cases where allergens or nutritious content varied from the non-GM source. In fact, the task force in charge of the consultation process announced as a done deal that "…general principles for labelling foods from biotechnology [had] emerged from a series of multi-stakeholder consultations over the past four years." These principles, they reiterated, were consistent with the Food and Drugs Act which allowed labelling in cases of health or safety concerns and voluntary negative or positive claims providing the claims were truthful and not misleading.[47] The strategy should then focus on means to inform and educate consumers about the Canadian regulatory system.

The only forum in which labelling was discussed during the renewal process was the inquiry of the House Standing Committee on Agriculture and Agri-food. This inquiry

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[45] Fédération nationale des associations de consommateurs du Québec, Position et commentaires de la FNACQ…, 2-3.

[46] Agence canadienne d'inspection des aliments, « Étiquetage des aliments issus du génie génétique au Canada, » 22 mai 1998.

[47] Canadian Biotechnology Strategy Task Force, Biotechnology in Agriculture and Agri-Food. A Consultation Document for the Renewal of the Canadian Biotechnology Strategy (Ottawa: the Task Force, February 1998), Appendix III, p.29.

was not, however, an official part of the renewal process since it was on the Committee's own initiative that biotechnology was examined. And it was because of the insistence of NGOs taking part at the hearings that labelling was examined. This examination, however, was sandwiched among a wide set of concerns related to the advantages of biotechnologies in agriculture and without it being specifically put on the agenda.

The FNACQ used these hearings to continue condemning the government's lack of transparency in the process that led to the 1995 federal position on labelling. Along with environmental defence associations, this association was opposed to farmers associations, the government (CFIA, AC, HC), industry, grocery distributors and even the Canadian Consumers Association (CAC). This latter group agreed with the government that only nutrition and allergy reasons should motivate special labelling or a mention that a given food is the product of biotechnology or contains GM products. In their view, the great technical difficulties associated with labelling did not justify the costs and would not bring anything to the consumers. If people knew about the regulatory process requirements, they would not be so worried. Information was the key. CAC even argued that consumer education could, within a few years, eliminate the need for mandatory labels:

> *"CAC urges that less time be devoted to debating the theoretical and practical pros and cons of mandatory labelling of genetically modified foods as the only option available for providing consumers with information and choices. We ask that discussion with stakeholders and the public be meaningful and focus on clearly examining a full and relevant range of potential cost-effective, relevant, and enforceable options that would provide consumers with the consistent, relevant, and accurate information they need to make informed choices about genetically engineered foods and indeed all foods in the Canadian marketplace."*[48]

In its intervention at the inquiry of the House Standing Committee on Agriculture and Agri-food, CAC was directly in line with the government's position, suggesting that the food supply system simply needed to be trusted: *"The challenge we face is to increase the public's knowledge about plant biotechnology and how it is regulated. We need to share our confidence in the safety of Canada's food supply system."*[49]

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[48] Testimony of Ms. Christine Mitchler (Chair, Food Committee, Consumers' Association of Canada) 1115, in Hearings of the Standing Committee on Agriculture and Agri-Food, Evidence, Tuesday, May 12, 1998.

[49] Notes for an address by the Honourable Lyle Van Clief, minister of Agriculture to the BIOTECanada luncheon series "Windows on the world," Ottawa, Ontario, November 6, 1998.

Faced with divergent opinions, the House of Commons' Standing Committee on Agriculture and Agri-Food recommended that: "In light of the rapid development of food production technologies, which has led to unresolved issues surrounding labelling, [the parliament], in consultation with all stakeholders, undertake a review of Canadian policy on labelling."[50]

The Canadian government ignored this recommendation as it globally ignored the work of the Committee during the renewal process. No mention was made of labelling in the action plan of the new strategy, much less of their recommendations. The decision was already taken by the government to keep in line with the original guidelines for labelling of novel foods. The challenge then was to avoid that opposing views force the government to change his position. As the debate over GM food was starting to heat up, the Canadian government decided to turn itself to the development of voluntary standards. This way, it could claim to be taking consumers' right to information seriously without hurting the industry and attracting attention to the fact that Canada had already allowed many GMOs to be put on the market without any segregation measures.

7.2.3 Standards for Voluntary Labelling

A study about ways to achieve voluntary labelling had already been commissioned. Financed by CFIA and executed by the National Institute of Nutrition, an industry-led, not for profit association concerned with promoting nutrition, this focus group based study had the mandate to *"address the question of consumer interpretation and understanding of voluntary label messages as they could apply to foods derived through biotechnology*."[51]

In 1999, at the demand of the Canadian Council of Grocery Distributors, the Canadian General Standards Board (CGSB) was asked to develop norms for voluntary labelling of GM food. In September of that year, the *Committee on Voluntary Labelling of Food Obtained or Not Obtained through Genetic Modification* was created, supported financially by Agriculture and Agri-Food Canada. The goal of the Committee was to

[50] Recommendation 5: "In light of the rapid development of food production technologies, which has led to unresolved issues surrounding labelling, the committee recommends that parliament, in consultation with all stakeholders; undertake a review of Canadian policy on labelling." Standing Committee on Agriculture and Agri-Food, Capturing the Advantage: Agricultural Biotechnology in the new millennium (Ottawa: the Committee, May 1998), 13.

[51] National Institute of Nutrition, Voluntary Labelling of Foods from Biotechnology, Executive Summary. 1999.

make sure that a voluntary standard would "give consumers information to make choices" and to make sure that any claim that a product contains GMOs or not will be true, non-misleading and understandable.

The consultation process involved 53 voting members. But a total of 28 NGOs had refused to participate to the Committee, including the FNACQ and environmental defence groups. These groups felt that, in accordance with the wishes of a majority of Canadians, mandatory labelling was what should have been discussed. Friends of the Earth also questioned the neutrality of the people in charge:

> *"The government's Committee on Voluntary Labelling of Foods Obtained or not Obtained through Genetic Modification has been boycotted by 28 non-governmental organisation (NGOs) since it began in November 1999. NGOs argue that the panel should be discussing mandatory labelling. In addition, the approach of the committee is to put responsibility for labelling on companies producing non-GE food, not those using GE food. This panel has spent a year and a half avoiding the real issue and has no completion date scheduled. NGOs fears of a bias on the committee were confirmed last year when the panel's former chair, Lee-Ann Murphy, left her position to become a public relations officer for the biotechnology company Monsanto."*[52]

For FNACQ's Nathalie St-Pierre who participated as a non-voting member, this committee was simply a means to slow down any attempt to move toward mandatory labelling: its composition was biased, the amount of work required was enough to discourage any non profit organisation to participate and, finally, Agriculture and Agri-Food Canada financed and controlled the process and would most probably have a great impact on the outcome.[53]

This important opposition and the absence of some meaningful and informed players did not stop the Special Committee from going on with the work. People in charge continued to refer to it as having a "balanced participation" and those who addressed those critics were cast as "activists".[54] Participants were classified along three

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[52] Friends of the Earth, "Letter to the Members of the House of Commons," November 1999.

[53] Testimony by Nathalie St-Pierre (Director General, Action réseau consommateur) to the Standing Committee on Agriculture and Agri-Food, Étude sur l'étiquetage obligatoire, mardi 6 juin 2000. (1020).

[54] X, Committee on Voluntary Labelling of Food Obtained or Not Obtained Through Genetic Modifications, Interviewed by Author, Toronto, 17 June 2002.

categories: users, producers and general interest that allowed creating the illusion of fair participation. As long as the initial balance between these categories was respected during the entire process and as long as at least one consumer association - representative or not - was part of the discussion, it was apparently thought that this claim could be sustained. A closer look at the categories, however, shows that industry was overrepresented.[55] According to opponents, at least 80% of the members of the committee had industry ties and Industry Canada's Office of Consumer Affairs was not represented.[56]

The food industry however knew that genetic modification was a negative identification for consumers, and that any GM-free label would give a negative image to other products not identified as such. Industries simply had an interest in limiting as much as possible any type of labelling that could help consumers locate GM or GM-free products. But until voluntary standards were ready, food producers were allowed to advertise as GMO-free, as long as their claim was, as the Food and Drugs Act specified, truthful and not misleading. Some, especially organic-food producers, had started to do so, a situation that grocery distributors, who were at the origin of the initiative for the development of voluntary standards, were starting to find irritating.

Arguing that these GM-free labels were unfair to both consumers and competing food manufacturers,[57] members of the Canadian Council of Grocery Distributors, representing the largest food distributors in Canada, decided, in the spring of 2001, to stop carrying any GM-free label products. Loblaws, Sobeys, A&P, Safeway, Provigo and other big players simply announced they would banish any product labelled as GM-free off their shelves by September 2001, leaving no choice for suppliers to remove any such labels if they hoped to keep access to these big grocery chains. Their message was clear: until voluntary standards for labelling are ready, no GM-free label will be allowed on our shelves.

But what industrial firms understood well was that, in a food system where there was no segregation between GM and non-GM food and food ingredients, the burden of proof was to be transferred to those wishing to make negative labelling. Furthermore,

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[55] Users included chefs, bakers, cooks and the very controversial Consumer Association of Canada. Producers included growers. Finally, general interest included academics, relevant government departments, grocery distributors and not-for-profit industry associations. In theory, industries and industry associations could be represented in each of these categories.

[56] "The Labelling of Genetically Engineered Foods," Letter to Ministers Rock, Van Clief and Manley, November 1999. This letter was signed by 27 Canadian NGOs.

[57] To our knowledge, it was the first and only time grocery distributors showed such a concern for the truthfulness of the labels found on their shelves.

the more they waited, and as increasing number of GMOs were getting grown and sold in Canada, the more difficult it would get for those wishing to advertise as such.

Although food processors and grocery distributors were in favour of a form of voluntary labelling, they knew it was in their interest to delay as much as possible the adoption of these norms. Conveniently enough, in the absence of a time limit for the production of these standards, and with large distributors and food producers sitting on the *Committee on Voluntary Labelling*, the committee seemed to be in no rush to complete the work. Beside the complexity of the task, the size of the committee (53 voting members) and its decision mode did a lot to prolong the work beyond an acceptable time frame.

Furthermore, the very existence of such a committee gave the government arguments to temporarily withdraw from the question while giving the impression that they were active on the issue: the government was waiting for the recommendations of a large consultative body before taking a decision. Not waiting for their work to be completed would show disrespect for participating interest groups: "*Then they will make recommendations to us. We will sit down as a government and look at those, and decide what regulations we want to put in place as a result of that.*"[58]

In the absence of any system that would allow segregating GM and non-GM commodities and with the perspective of genetic pollution already being a reality in Canada, labelling was seen as a threat to the Canadian food industry. As new GM products kept getting on the Canadian market, food industries had a clear interest in taking time before any standard was ready to use. As time went by, cross-pollination would make it increasingly difficult to identify with a reasonable degree of certainty, any food or food products (even organic products) as GM-free. The cost of a GM-free labelling would simply be too high.

Conveniently enough, it took almost five years for the Committee to complete the work. After a lengthy consultation process, the making of standards for voluntary labelling came to an end with the approval by the Standards Council of Canada, in April 2004, of the *Standard for Voluntary Labelling and Advertising of Foods That Are and Are Not Products of Genetic Engineering*.[59] However, because those who used GM

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[58] Lyle Van Clief, Canadian Minister of Agriculture, transcript of an interview with Peter Mansbridge, in The National on CBC Television, June 13, 2001.

[59] Despite the fact that the work of the Committee was boycotted by important actors, the committee's recommendations were still said to be the fruit of "a "balanced stakeholder representation." Canadian Food Inspection Agency, "Consensus Reached on Voluntary Standard for Labelling of Genetically Engineered Foods," news release, September 8, 2003; CFIA, "Voluntary Standard for Labelling of Genetically Engineered Foods Becomes National Standard," news release April 15, 2004.

ingredients did not wish to identify their products as such and because, in the meantime, it had become increasingly difficult to segregate GM-and non-GM ingredients, very few companies have since bothered using the standard for any form of labelling.

7.2.4 The battle for mandatory labelling

Industry was strongly against mandatory labelling. It knew that any identification of a food with genetic modification would be perceived negatively by consumers and interpreted as a health and safety warning.

> *"To a brand manager, GM labelling "means the consumer will stand away from the product and think of it as less quality, think of it as potentially dangerous." (…) "…despite assurance of safety, we know that 40% of Canadian consumers view GM labels as health and safety warnings. We would rather remove GM ingredients from our products than mislead consumers into thinking that our products are not safe."*[60]

Furthermore, the strategy of those asking for mandatory labelling was interpreted as an attempt to stop the use of GMOs: "The rationale for wanting mandatory labelling was not to inform Canadians for their better judgement; it was really to stop industry from using GM products."[61]

On November 4 1999, just as the *Committee on Voluntary Labelling* was beginning its work, the pressure in favour of mandatory labelling started to intensify when the Bloc Québécois's Hélène Alarie, then a member of the Standing Committee on Agriculture and Agri-Food, presented to the Canadian parliament the first private member's bill (Bill-C-309) to amend the Food and Drugs Act in favour of mandatory labelling. About a month later, feeling that the question of labelling needed further inquiry, she also presented a motion asking for the examination of this issue by the Standing Committee on Agriculture and Agri-Food of which she was a member. The bill was defeated and she met serious difficulties having the motion accepted by the Liberal majority.

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[60] Testimony by Laurie Curry, (Food and Consumer Products Manufacturers of Canada), Hearings of the Standing Committee on Health, Edited evidence, Meeting no.65 (11:25) April 11, 2002.

[61] X, Committee on Voluntary Labelling of Food Obtained or Not Obtained through Genetic Modification, interviewed by author, Toronto, Canada, 17 June 2002.

Although the motion to study mandatory labelling was adopted on December 15, 1999, the Chair of the Committee came back on the decision on Marsh 16, 2000, trying to modify it so that the question could be studied by a Health/Agriculture mixed committee. Hélène Alarie argued against that change, believing that it would have diluted the question too much, making it impossible to reach conclusions that can be applied to agriculture. According to some other members, the Chair's proposal was unprecedented and against procedural rules. The Liberal majority, however, voted in favour of this modification. A few days later, the Committee had to go back to its original decision and adopted the first motion for a second time.

A lot of time was wasted in the process. According to procedural rules, a consensus was required to create a mixed committee, a consideration that the Chair of the Standing Committee was apparently not aware of at the time. Although Mme Alarie had insisted on the urgency to study the question of labelling, it took more than 6 months before the study could begin on May 18, 2000. This delay would have been longer if the Chair of the committee had succeeded in creating the mixed committee. A total of three study sessions were completed by the Committee but no report was produced due to elections. The work of the Committee was pretty much ignored by the media.

The debate peaked in 2001 when the Royal Society report, by raising doubts about the Canadian regulatory system, also increased the interest of the press in GMOs issues. The decision of the Council of Grocery Distributors to ban all "GM-free" voluntary labelling from their shelves also helped publicize the issue and raised public support for mandatory labelling.[62] When the Caccia Bill (C-287) was tabled in May 2001, Canadians were already widely supporting mandatory labelling. This time it was tabled by a member of the governing party, backbencher Liberal MP Charles Caccia. Bill C-287 received wide support from some consumer associations and from environmental defence groups among which Friends of the earth, Greenpeace, the Council of Canadians and FNACQ. Polls were showing that up to 95% of Canadians wanted GM food to be labelled.[63] In the fall of 2001, even Health Minister Alan Rock surprised everyone when he declared himself in favour of mandatory labelling.[64] During the summer of 2001, it seemed as if those supporting mandatory labelling had a good chance to win the battle.

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[62] X, Council of Canadians, interviewed by author, Ottawa, 25 April 2002. See appendix 4 for a press review of these events.

[63] Environics Research Group. "National Poll and Cross-Country protest Demonstrate Consumers Won't be Fooled by GE Foods." Poll conducted for the Council of Canadians, News Release, March 31, 2001; Council of Canadians. "Results of Environics Poll on Canadian Consumer Attitudes to Genetically Engineered Foods". March 31, 2001; Same results from Greenpeace Poll on labelling of genetically engineered food. Decima research. Released September 21, 2001.

[64] "Rock wants labelling on modified food," The Globe and Mail, 5 October 2001 sec. A, p. 21. "Will the real Allan Rock please stand out?" The Globe and Mail, 13 October 2001, sec. A, p.12.

Even MPs were pressured by their constituents: *"I've had MPs tell me that they've never received that many calls on any issue – not even abortion. This has been like huge. We did everything we were supposed to do but they still turned down and opposed it."*[65]

The Bill was defeated by the Liberal majority in October 2001. Minister Alan Rock did not even show up for the vote. The Council of Canadians argued that a letter sent by four ministries - Industry, Trade, Health and Agriculture and Agri-Food - had contributed to shift the balance.[66] Without clearly asking MPs to vote against Bill C-287, this letter announced that the Standing Committee on Health would examine the questions rapidly, thus implying that the government preferred that the question be examined further before a decision was to be made. This vote, taken only a few weeks after the 9/11 events, did not make much noise in the media.

Following the vote and responding to the demand of the four ministers, the House Standing Committee on Health and the House Standing Committee on Agriculture and Agri-Food both began to study the matter independently. Work of the Standing Committee on Agriculture began in January 2002. These hearings' goal was "to identify the best options for meeting consumers' information needs with respect to GM food," with a special look at "the impacts of mandatory and/or voluntary labelling of transgenic food on farmers and the agri-food industry."[67] The recommendations were based on four meetings held in January and February 2002. It had an added concern for the impact of labelling on farmers.

The meetings of the House Standing Committee on Agriculture and Agri-Food were characterized by the absence of environmental groups, organic growers and the scientific community. The only opposing voice was that of the National Farmers Union. Furthermore, the only consumer association that was represented was the Consumers Association of Canada which (unlike its counterparts in France) had been against mandatory labelling since the beginning. The Standing Committee on Agriculture and Agri-Food produced a report in June 2002, a report that ignored previous work on the topic (2000) and that did not bother to mention the fact that important players did not get to give their opinion on the issue: "the Committee (…) heard close to twenty groups representing the various components of the agriculture and agri-food industry". The report recommended that the government continue developing a standard for voluntary

[65] X, the Council of Canadians, interviewed by author, Ottawa, 25 April 2002.

[66] As argued by the Council of Canadians, the purpose of this letter was to influence the vote of MPs. Council of Canadians. http://www.canadians.org/campaigns/campaigns-mp_voted.html

[67] Standing Committee on Agriculture and Agri-Food. Labelling of Genetically Modified Food and its Impacts on Farmers. (Ottawa, The Committee, June 2002).

labelling of food derived from biotechnology.[68] For the Bloc Québécois, "the resulting report by the Committee was part of a trend where playing for time seems to be more of a priority than prevention."[69]

The hearings of the Standing Committee on Health were, on the other hand, an occasion to involve scientists in the discussion. The diversity of groups and organizations auditioned could have led to out of the ordinary balanced conclusions. Members of the CBAC expert Committee, Drs. Naimark, Phillips and Hendricks, Co-chairs of the Expert panel on the Future of Food Biotechnology of the Royal Society of Canada, the Plant Biotechnology Institute, and scientists expressing themselves as individuals were auditioned by the Committee. For the first time, the Office of Consumer Affairs of Industry Canada, which had been involved in consumer research since the early 1990s, was invited to testify. However, after April 2002, the Committee had to delay the work to move to legislation and subsequently, the House prorogued, "leaving the request from the ministers in limbo."[70] For some observers, the Committee had simply been derailed: *"The pesticide bill was introduced by the new Health minister…and it knocked the GE stuff right off the agenda. It turned out that was not possible so hearings were abruptly stopped just as the evidence had incredibly mounted to dispute most of what MPs had been told about biotechnology."*[71]

The Committee came back to the study in 2003, without any clear intentions as to how or if a follow-up should be done. The two last meetings held in March and May 2003 were meant as an update. Unfortunately, the Committee called some of the witnesses that had already been heard: CFIA, Health Canada, Special Committee on Voluntary Labelling, Canadian General Standards Board, and CBAC but omitted to invite scientists who had contributed a year before. Although important questions had been raised in the 2002 hearings about genetic engineering and the fact that any such modification might induce changes of a wider extent than supposed by Canada's regulatory assessment, the Committee chose to close the investigation and no report was produced.

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[68] Standing Committee on Agriculture and Agri-Food. Labelling of Genetically Modified Food and its Impacts on Farmers. June 2002.

[69] Bloc Québécois. Dissenting Opinion in Standing Committee on Agriculture and Agri-Food. Labelling of Genetically Modified Food and its Impacts on Farmers. June 2002.

[70] Standing Committee on Health. 2nd session, 37th parliament, meeting no.27 March 26, 2003.

[71] X, Canadian Health Food Association, Interviewed by author, Toronto, 17 June 2002.

7.3 Conclusion

In both cases, the Canadian government avoided the raising of institutional risks by staying away from further scrutiny of previous decisions and evaluation processes. In a way, labelling and rBST both tell the same story about the Canadian strategy to avoid bending to opposing views: Authorizing rBST or banning it on the basis of human health issues would have brought important questioning about Health Canada's internal evaluating procedures and corroborate allegations of mismanagement. And the application of mandatory labelling would have brought attention to the issues of cross-pollination and genetic pollution with important scrutiny of previous market authorization. It could have led to a demand for more transparency of the evaluation procedure and open the "black box" to outside scrutiny.[72]

In both cases, rBST and labelling, the Canadian government succeeded in marginalizing and silencing opposing voices by ignoring any report, even parliamentary reports, that went against the government's orientations and by exhausting NGOs scarce resources and motivation in redundant and sometimes useless and unbalanced consultations. By sending positive messages about the government's accomplishments and by denying any problem, the government also contributed to marginalize conflicting views all the while keeping away from any endeavour to re-examine regulatory institutions and processes. Neither alleged conflicts of interests, nor accusations of mismanagement succeeded in forcing the government to set up an in-depth investigation of the ways of operating within regulatory institutions.

All the while, the government, using symbolic measures, was pretending to be attentive to the situation, commissioning outside panels to study the issue, calling for parliamentary hearings that would later be derailed or biased in favour of pro-biotechnology actors. In Canada, the party in power controls the House of Commons committees, and very often the Senate committees as well. The government was most likely well aware that this strategy allowed gaining time; time is useful for getting the press and the public to forget about many controversies. If blamed for not taking decisions, the government could always reply that it was waiting for a report to be tabled or for the work of a committee to be completed.

The story of the issue of labelling GMOs in Canada, from the early position Canada defended at the Codex committee in 1994 to the rejection of a private member's bill in favour of mandatory labelling in October 2001, is eloquent in showing how the

[72] See Chapter 6 about the regulatory framework in Canada for further reference to the « black box ».

Canadian government succeeded in keeping the status quo and avoiding significant changes to existing regulations.

The story of rBST in Canada, in contrast, describes how, despite parliamentary hearings, internal dissent within Health Canada, troubling allegations of mismanagement and possible conflicts of interests, the Canadian government and Health Canada managed to settle the issue in such a way that no significant modification and no in-depth inquiry was made about Health Canada's managerial culture and ways to evaluate biotechnology-derived veterinary drugs. The "forgetting" of the rBST issues by way of its refusal for animal health reasons also contributed to circumvent the fact that other biotechnology products had already been approved or were currently receiving market authorization from CFIA.

These case studies show how, despite the emergence of important public controversies, the Canadian government was successful in avoiding any significant institutional scrutiny and succeeded to maintain initial orientations over biotechnology and GMOs. With rBST and labelling, the government globally maintained the status quo by silencing and marginalizing opposing voices, by sending positive messages about the government's accomplishments and, when needed, by ordering symbolic measures to reassure the population. In the process, parliamentary institutions were manipulated to assist in distracting public attention and in helping the media forget the issue. In both cases, the Canadian government avoided a rise in institutional risks by staying away from further scrutiny of previous decisions and current evaluation processes. In a way, labelling and rBST tell a similar story about the Canadian strategy to avoid responding to opposing views and to prevent institutional risks.

CHAPTER EIGTH

Public Consultations

Public Consultations can become a key part of communication strategies and discourse formation. In particular, they can contribute to the control or reorientation of discourse. Governments can either use them to allow public discussion about risks or to orient the debate toward less controversial issues. The mode and balance of participation have a great impact on their outcome because they can offer a tribune to either radical or middle ground views. In some cases, consultations can also have a symbolic impact when the simple claim that wide consultations took place is not counter balanced by an examination and critical analysis of their inclusiveness or their openness. In some cases, what is said about those very consultations becomes more important than the consultations themselves. In sum, public consultations can be an attempt by their organizers to regain control and legitimacy over discourse and in decision making.

This chapter compares the qualities, impact and context of two major consultations: the consultations that led to the 1998 renewal of the biotechnology strategy in Canada and the 1998 citizen's conference in France. In 1998, while France was already dealing with an important public controversy over GMOs, Canada was only starting to feel the pressure of public opinion. Both countries, however, announced that they would mount major public consultations. In Canada, it was motivated by the necessity to give some legitimacy to the new national biotechnology strategy; in France, it was to defuse a debate where, it was thought, polarized opinions had taken too much space and were bringing policy making to a standstill.

There is no doubt that both countries were aware of the possible impact of public consultations on the biotechnology debate because both countries made strategic choices to encourage middle ground views to be expressed and to avoid offering a tribune for radical views. In the process, both countries were hoping to regain and retain a certain degree of legitimacy in decision making. But Canada and France took very different paths. While France chose to concentrate the debate on GMOs in agriculture, the Canadian consultation was about all biotechnologies. In Canada, themes that were brought to the attention of stakeholders and the public were chosen by a public administration special task force under the aegis of Industry Canada, permitting them to sidestep litigious questions such as labelling, regulations or the role of Canadian Environmental Protection Act. In France, the consultations were put in the hands of a mixed parliamentary delegation specialized in science and technology and the themes that were discussed were all targeting controversial questions chosen first by a panel of

scientists and later validated by a panel of citizens. In Canada, the government did not allow the parliament to play an important role in the National Biotechnology Strategy (NBS) consultations: parliamentary hearings that were taking place in parallel were widely ignored in the process as were their conclusions. In France, the involvement of the parliament was a means to give more legitimacy to the process and the conclusions. Also, the recommendations of the citizen's panel were included in a report of the parliament.

8.1 France and the Citizen's Conference

The consultation that took place in France in 1998 was the object of a report by the the *Office parlementaire d'évaluation des choix scientifiques et technologiques* (OPECST) and was studied in-depth by an Institut Nationale de la Recherche Agronomique (INRA) team of sociologists with the support of a subsidy from the *Direction générale de l'alimentation* of the French *Ministère de l' Agriculture et Aménagement du Territoire*. The account that follows draws largely on these sources.

By the end of 1997, France was pressed to take a decision concerning the Novartis BT corn-176. In conformity with Directive 90/220, until France, the country in which the request for authorisation had been initially placed, allowed this variety to be grown, no other European country could give it authorization. To move ahead on the issue, the newly elected Socialist government led by Lionel Jospin called an important cross ministerial consultation that led, in November 1997, to the announcement of the intentions of the government. This political statement included the commitment to organise a public debate on GMOs in the course of 1998, the promise to create a surveillance network and a pledge in favour of consumer information and labelling.[1] The Jospin government also announced its decision that genetically modified plant varieties that can cross-pollinate with native varieties such as soy or sugar beet were not going to be allowed in France, even if this policy meant going against the European directive. In contrast, because of low risks of cross pollination, Novartis BT corn was to be authorised to be grown in France.

According to Joly et al., the announcement that a public debate would soon take place served two objectives. First, the debate was seen as a tool to channel and depolarise

[1] Pierre-Benoit Joly et al., L'innovation controversée : Le débat public sur les OGM en France. Rapport de recherche, INRA, Collectif sur les risques, la décision et l'expertise, Janvier 2000, 124.

the debate. Second, it provided an argument that France could use on the international scene to justify delaying some decisions about GMO authorisations.[2] This public debate was also apparently motivated by the hesitation of regulatory authorities to take a decision based solely on expert opinions. With Novartis BT corn, an opinion of the CGB had been overridden by the government, which was, according to Joly and Marris, in direct contradiction with the French tradition to hand over scientific decisions to experts. This denigration of the CGB's expertise, likely a fall-on effect of the difficulties for political authorities that had arisen from mad cow and tainted blood scandals, indicated the government's increased concerns for social acceptability.[3] Joly reported that a group of senior officials which had promoted the idea of a consensus-building conference believed that a panel of experts did not have any more the legitimacy to take decisions about GMOs. Social acceptability also had to be taken into account and the population had to be part of the decision in some way. Accordingly, a dialogue had to be established between experts and society; the "incestuous" relationship between experts and the administration had to be ended.[4]

When the French government announced that there would be a public debate on GMOs, it also declared that the choice of a consensus conference was motivated by the need to favour an open and full debate between experts and citizens.[5] But in France, actors usually come to an agreement through a process of conflicts and opposition. The model of the consensus conference had to be adapted to France's specificity. It thus became a conference of citizens, a format, according to Joly *et al*., which was more in accordance with the common French approach of reaching agreements through conflict and opposition.[6]

For Joly *et al*., the choice of a consensus conference was motivated by the fact that the formula had been tested and that it allowed a public debate without offering a platform to the most radical opponents. A steering committee composed of scientists was appointed. It excluded interest associations because OPECST was trying to avoid that the conference be influenced by the prevalent logic of polarization. This decision also

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[2] Joly, Pierre-Benoît et al. «L'innovation controversée… », 126.

[3] P.B. Joly et Marris, C, « Mise sur agenda et controverses : Une approche comparée du cas des OGM en France et aux États-Uni**s » (**paper presented at the Colloque *Risques collectifs et situations de crise. Bilans et perspectives*, Auditorium du CNRS, Paris, France, February 7-9, 2001), 6.

[4] From excerpts of interviews conducted by Joly et al. with senior officials of the French Minister of the Environment, of Agriculture and from Matignon, quoted in Joly et al., «L'innovation controversée… » 125-126.

[5] « Extrait de l'annonce gouvernementale du 17 novembre, » in Joly et al., « L'innovation controversée… », 124.

[6] "Par tradition, l'accord en France nait moins d'un consensus que des compromise établis dans une logique d'opposition et de conflits."Joly et al., 131.

brought some criticisms on the part of associations where they questioned the organisational approach and impartiality of the conference.[7] An examination of the 1998 French public consultations, however, shows that it did permit confrontations between contradictory opinions because of the variety of experts involved and that it did allow the expression of median opinions because of the direct participation of ordinary citizens.

In France, to give more legitimacy to the debate and for representativeness concerns, it was the Parliament, through the *Office parlementaire d'évaluation des choix scientifiques et technologiques*, that was put in charge of organizing the public consultation. The OPECST is a mixed parliamentary delegation whose mission was to inform the parliament about scientific and technological choices.[8] This consultation was designed in four steps: private hearings of 250 people by the OPECST; public hearings open to the press organized as round tables where contradictory opinions were expressed and debated; an Internet forum; and a citizen's conference. According to Joly *et al*., the integration of the citizens' conference into a parliamentary study gave it an institutional recognition and helped legitimize its existence. Conclusions of the conference would be made available through the report of OPECST, giving it a legitimacy that otherwise it could not have had within the existing French institutional context.[9]

For the private hearings, the OPCEST interviewed 250 actors, 147 in France and the rest from abroad.[10] An examination of the distribution of the participants at these hearings shows that, not only was the OPECST concerned to reach a certain balance between industries (33%), NGOS (29%), science (24%) and public administration (14%), but also it made a point of speaking with all the main French actors, even the most radical ones.

Public hearings were organised around 6 themes in the mode of debate panels: economic and international stakes for agriculture and food; research stakes; regulatory stakes or how to bridge together expertise and public decisions; consumer information,

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[7] Ibid., 125-126 and 129.

[8] « Créé par la loi n° 83-609 du 8 juillet 1983, l'OPECST a pour mission d'informer le Parlement des conséquences des choix de caractère scientifique et technologique afin d'éclairer ses décisions. A cette fin, il recueille des informations, met en œuvre des programmes d'études et procède à des évaluations. L'Office constitue un intermédiaire entre le monde politique et le monde de la recherche. Il se doit d'être à l'écoute des milieux de la recherche et de solliciter des avis autorisés. Ainsi, pour réaliser ses travaux, l'Office est assisté d'un Conseil scientifique qui reflète dans sa composition la diversité des disciplines scientifiques et technologiques, puisqu'il est constitué de vingt-quatre personnalités de haut niveau choisies en raison de leur compétence. » http://www.senat.fr/opecst/presentation.html (accessed 25/10/2009).

[9] Joly et al., 127.

[10] OPECST, De la connaissance des gènes à leur utilisation - L'utilisation des organismes génétiquement modifiés dans l'agriculture et dans l'alimentation, RAPPORT 545 (97-98), Tome 1(Paris : the Office, 8 juillet 1998), sections « conclusions du rapporteur » et « personnalités auditionnées ».

including labelling, traceability and food security; risks and benefits of GMOS and environment; and finally, risks and benefits of GMOs and health.[11] A close examination of the participants in these round tables showed that most of them were recruited from among personalities auditioned during the private hearings. It also showed that the composition of the round tables was indeed conducive to a debate and inclusive of main opponents and defenders. Transcripts of these debates were included in the final report of the OPECST. Although it could have been the occasion for the press and the authors of the report to be exposed to a range of contradictory arguments, public hearings did not attract the attention of the French press. *Le Monde* was one out of only few newspapers which reported on the event.[12]

The citizens' conference, however, succeeded in attracting a lot of media coverage because of its novelty. It became an event, and because of important media attention, it became an occasion for a wide range of opinions to be expressed publicly (see also appendix 4 for a complete press review). According to Marris and Joly's observations: "Ce context créa un nouvel espace public dans lequel les différentes parties prenantes, y compris celles qui ne s'étaient pas impliquées auparavant, furent forcées de réapprécier ou de clarifier leurs positions. La nature du réseau d'institutions concernées par le débat sur les OGM en fut radicalement mofifié…".[13] For the occasion, INRA produced a special report, and commented on different research programs. The involvement in the consultation process of many leading scientists was, according to Joly et al., an occasion for them to learn alternative ways to interact with society.[14] For an INRA president, this consultation and direct interaction with citizens was seen as a means to gain more legitimacy for public research.[15]

The conference was also the occasion for NGOs to make their voices heard. An important petition, signed by no less than 200 000 people and asking for a moratorium on commercial use of GMOs until a national debate took place in agriculture, was reported to be submitted at the time. [16] Industries too tried to influence public opinion with a publicity campaign that did not produce the expected outcome. Their decision to buy

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[11] OPECST, De la connaissance des gènes à leur utilisation - L'utilisation des organismes génétiquement modifiés dans l'agriculture et dans l'alimentation, rapport 545 (97-98), tome 2 (Paris : the Office, 8 juillet 1998), « auditions publiques ».

[12] Catherine Vincent, « Les risques sanitaires des aliments transgéniques inquiètent le Parlement, » Le Monde 30 mai 1998.

[13] Claire Marris and Pierre-Benoît Joly, « La gouvernance technocratique par consultation, » Les Cahiers de la sécurité intérieure, 38, 4e trimestre 1999, p.97-124.

[14] Joly et al., 142.

[15] From transcript of a personal interview with Président of INRA quoted in Joly et al., 142.

[16] « Deux cent mille signatures pour un moratoire, » Le Monde 23 juin 1998, p.10.

pages of advertising in major French newspapers was decried as lobbying attempts and contributed to further irritate public opinion.[17]

The last step of the consultation process was the citizens' conference. Fourteen citizens (14), selected by a polling firm on the basis of their representativeness and neutrality, were asked to attend two information weekends where experts chosen by the steering committee gave presentations and answered questions of the panel. They were then asked to formulate questions and to choose experts for the conference. Five broad themes having to do with health, environment, economy, law and politics were chosen by the citizens around which the conference could be built:

Table 3: Main Themes of the Citizen's Conference[18]

Health	Given the current state of knowledge, what are the consequences of GMOs on human health?
Economy	Given the economic stakes linked to consumer information, what is planned about labelling and consumer information?
Environment	How can we be sure that risks of gene proliferation are managed?
Judicial	How are hypothetical long term effects taken into account in the law?
Political	How should the power relationships between economic interests and politics be regulated?

For each theme that was chosen by the panel of citizens, a panel of 5 to 6 people was created to debate the questions. Here again, the composition of the 5 panels did reflect the intention to have a real debate. Participants were chosen on the basis that they would bring different and diverging points of view. For example, the panel that was invited to debate on the political theme consisted of representatives from Greenpeace, Confédération paysanne, Novartis, the Direction générale de l'alimentation (DGAL) and the Fedération Nationale des Syndicats d'Exploitants Agricoles (FNSEA). According to

[17] Thomas Ferenzi. « Arrogante publicité? » Le Monde, 29 juin 1998, p.22. « Examen de passage » populaire pour les plantes transgéniques – Les messages des industriels, » Le Monde, 20 juin 1998, p.24.

[18] OPECST, De la connaissance des gènes à leur utilisation…RAPPORT 545 (97-98), Tome 1, « conclusions du rapporteur, conférence de citoyens ».

Joly et al., citizens would very freely, and sometimes to the astonishment of facilitators, challenge experts to further explain their positions and apparent contradictions in them.[19]

At the end of the conference, citizens were asked to submit a report to the OPECST. They recommended that changes be made to the CGB structure to make its composition more open and transparent. They asked that marker genes to antibiotics be forbidden. Because quality should come first, they recognized that GMOs might represent solutions to increase competitiveness in agriculture. But knowing that consumers were not the ones who were demanding GMOs, they made several recommendations: the segregation of GM and non GM products, the adoption of traceability devices, and the adoption of clear and enforceable labelling rules. They asked that the cultivation of GMOs come with environmental surveillance and the possibility to withdraw authorisations if any problem was to emerge. They recommended that public research be increased to preserve the independence of regulatory authorities from private research institutes and multinationals. Citizens were also of the opinion that research on ecological risks should be done before GMOs were diffused in the environment and that conclusions based on that research should be reached before authorizing any GMOs to be commercially grown. The panel was, however, not unanimous concerning the need of a moratorium on GMOs. Finally, the panel suggested that the law should include presumption of responsibility for those who introduce GMOs on the market or into the environment. Traceability was seen as a tool to achieve this goal.

The report of the OPECST integrated most of these recommendations, supporting the idea to fix public research and biosurveillance. Even though the government gave the impression to some that it was ignoring them by authorizing new GM varieties immediately after the conference, many of these recommendations would become part of the changes made in the long run to make GMOs more acceptable in France (See Chapter 5 on the evolution of the regulatory framework in France). According to Joly, given the situation and the interest in the technology, the OPECST offered a position that was more realistic than the citizens' recommendations. The government closed the consultation with a press communiqué announcing a series of decisions that were in accordance with the OPECST report and in continuity with the 1997 orientations. These were however perceived as going against the panel's recommendations even though the government was committing itself to reinforce consumer information and bio surveillance.[20]

[19] Joly et al., 134.
[20] Ibid., 148-149.

8.2 The Renewal of the National Biotechnology Strategy

In 1997, while the last elements of the regulatory framework were being put together, the federal government asked the Minister of Industry to launch a process to renew the National Biotechnology Strategy. With the commercialisation of biotechnology products, the public debate over the pros and cons of biotechnology had increased. The government was being advised, at the time, to respond to socio-ethical questions and to institute a public dialogue while developing the new strategy. It seemed that opinion polls were not enough anymore to keep abreast with public concerns. Among those advising the government, public input into the renewal was considered a condition for effective and legitimate policy-making and, where a consensus was unattainable, the government had been advised that the process could legitimate the policy.[21]

It soon became apparent, however, that the new strategy would not significantly depart from the orientations of the 1983 NBS. Indeed, the strategy was to be updated "to reflect current policy needs and strategic economic priorities". This commitment was clearly outlined in the renewal document with a recall that the 1997 Speech from the Throne identified biotechnology "as one of the important knowledge-intensive sectors targeted for future jobs and growth," a position that was in accordance with federal strategies and investments so far.[22] In fact, it was established, well before the renewal process started, that the new strategy would mostly be in continuation with the previous one: *"The new Canadian Biotechnology Strategy will build on the 1983 NBS policy framework, which recognized that Canada had an opportunity to use biotechnology to augment social and economic well-being."*[23]

The analysis of ideas promoted through the renewal shows that the government did not wish to debate previous orientations. The examination of the process leading to the new biotechnology strategy shows a clear will to increase its legitimacy without the cost. But to increase or to maintain public trust, the process leading to the renewed strategy had to prove inclusive and open. Not only was the renewal of the strategy to be the occasion for the Canadian government to reiterate its commitment to support

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[21] Jennifer Espey, "Socioethical Implications of Biotechnology," report to Industry Canada, 1996.

[22] Government of Canada, The 1998 Canadian Biotechnology Strategy: An ongoing renewal Process (Ottawa: Industry Canada. 1998), 4. The document mentions the "Jobs and Growth Strategy" and the federal "Science and Technology Strategy."

[23] Government of Canada, Biotechnology in Agriculture and Agri-Food. A consultation Document for the Renewal of the Canadian Biotechnology Strategy (Ottawa: the Biotechnology Secretariat, 1998), 1.

biotechnology, it also was the occasion to attempt to increase the legitimacy of its biotechnology strategy.

8.2.1 Renewal Process and Responsibility Sharing

Shortly after receiving its mandate to renew the Canadian biotechnology strategy, the Minister of Industry asked the National Biotechnology Advisory Committee (NBAC), a consultative body under the aegis of Industry Canada, to produce a report on Canadian biotechnology in an international context and to suggest ways to make Canadian industries more competitive. The NBAC was also asked to reflect on its own mandate and composition and to make recommendations on reforms that could put it in a better position to capture societal and economical implications of a fast evolving technology.[24]

The Minister of Industry also created a special task force to coordinate the renewal efforts with the departments involved. A series of consultations were launched with the announced intention to allow the broad public and a wide range of stakeholders to express themselves on the issue. It was decided that, on the one hand, NGOs would be invited, with other stakeholders, to participate to a series of consultations while, on the other hand, the population would be surveyed to "allow Canadians to give their input on the issue". A special task force supported by the CBS would be put in charge. Unlike France, the parliament was not asked to be part of the renewal process. The contribution of the parliament was a separate initiative that was largely ignored in the governmental reports.

At the time, over 20 departments and federal governmental agencies were reported to participate in this special task force. Of those, 9 had more direct and prominent responsibilities: Industry Canada, Environment Canada, Health Canada, Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency, Natural Resources, the National Research Council, Fisheries and Oceans and Foreign Affairs and International Trade.[25] The resources of the task force to work on the renewal process

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[24] Graham Strachan, president of the NBAC, "Introductory letter to the Honourable John Manley," in Comité consultatif national de la biotechnologie, Assumer le leadership au prochain millénaire, sixième rapport (Ottawa : Service de distribution, Direction générale des communications d'Industrie Canada : 1998).

[25] Government of Canada, The Canadian Biotechnology Strategy: An Ongoing Renewal Process, (Ottawa: Canadian Biotechnology Strategy Secretariat: 1998), p.3. Also in The Canadian Biotechnology Strategy Online, About the TaskForce, 17 march 1999. http://biotech.ic.gc.ca/archives/engdoc/bh00184e.html (accessed 06/09/2006).

were organised into 15 working groups and two management committees. The task force was responsible for the series of consultations - public and sectoral - that were later described as "the centerpiece" of the renewal process: stakeholder consultations, focus groups and a public opinion survey.

Examination of the survey and focus groups shows that the government was, however, more interested in raising the acceptability of new biotechnology applications than in the population's "input" per se. As appendix 5 demonstrates, the consultation process showed evidence of deficiencies in the balance of participation, the format of consultation as well as in the range of issues that were brought to discussion. But what made those consultations part of a discursive strategy in a decisive way was that these deficiencies were not at all discussed, much less emphasized in the renewal documents. They in no way contributed to discredit the consultations in the eyes of the government. On the contrary, these consultations were simply described as intensive, "broad-based" and "central".[26] The government also declared that the population was consulted through public opinion surveys, focus groups and a government website. This claim allowed the Industry Minister and Chair of the newly formed Biotechnology Ministerial Coordinating Committee to proclaim that, altogether; it was more than 5000 individuals and organisms that contributed to the elaboration of the renewed strategy.[27]

The nature and content of stakeholder consultations also showed that these did not allow a real questioning of orientations previously taken. Stakeholders were consulted on ways to ensure a continuity of existing policies and very little space was made to discuss established practices. Most of the regulatory objections raised by opponents over the years were simply excluded: labelling, substantial equivalence, role of the CEPA, transparency of the decision process and of the evaluation process. Rather, consultations focussed on questions having to do with marginal changes to the established structure: What structure and composition should an advisory committee have? Should it simply transmit information or create a real dialogue with the public? What kind of information should be made available to the public? Which organisation should be in charge and what should the vector be? Furthermore, participation in these consultations was conveniently segmented into three categories (knowledge-based, industry and the larger community) which, as is suggested in appendix 5, allowed an overly positive interpretation of the balance of participation.

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[26] Government of Canada, The Canadian Biotechnology Strategy, 1.

[27] Notes pour l'allocution de l'Honorable John Manley, ministre de l'Industrie, à la réunion inaugurale du Comité consultatif canadien sur la biotechnologie à Ottawa, le 13 octobre 1999. http://strategis.ic.gc.ca retrieved 20/04/00.

Finally, the public opinion survey and focus groups were meant to allow Canadians to "provide their input on the biotechnology issues that [were] currently confronting the government."[28] However, acceptability of the various roles the government was undertaking in the regulation and promotion of biotechnology and acceptability of different types of biotechnology applications were central to the survey. Focus groups even served to test the public acceptability of certain formulations of the vision and objectives of the new biotechnology strategy.

8.2.2 Ideas Promoted through the Renewal Process

The renewal of the biotechnology strategy was an event that held the essence of the government's biotechnology discourse. It can be argued that four interrelated ideas were central to the new strategy: Firstly, because biotechnology was considered a source of socio-economic and environmental well-being it deserved continued support; secondly, Canada was or should become a leader internationally for its products and regulations; thirdly, environmental and health risks did not need to be discussed because they were well taken care of through the existing regulatory framework; finally, and as a consequence of the first three ideas, public information and the establishment of a dialogue on socio-ethical issues were the key to regain public trust.[29]

The following pages will develop further the main ideas brought forward by the consultative process that led to the renewal of the Canadian biotechnology strategy. I describe here the context in which they were promoted and discuss how they shaped discourse by putting forward or concealing some types of risks, or by responding to existing risks and fears. I look at the 1998 NBAC report, consultation documents, summaries of the consultations and results of the public opinion survey produced and commissioned by the Task Force. I also review the renewed strategy published by the

[28] Environics research Group Limited, "Renewal of the Canadian Biotechnology Strategy Public Opinion Research", November 1998, on The Canadian Biotechnology Strategy Online. Retrieved 06/11/23. www.strategis.ic.ga.ca/SSG/bh00239e.html

[29] These ideas were implicit in the proposed objectives of the CBS renewal: "to ensure that Canadians have access to, confidence in, and benefit from, safe and effective biotechnology-based products and services; to position Canada as a responsible leader in the development and sale of biotechnology products and services, domestically and internationally; to develop suitable mechanisms to support Canada's economic and stewardship objectives and to be a leader in promoting such mechanisms in the world arena." in Government of Canada. *Biotechnology in Agricutlure and Agri-Food. A consultation Document for the Renewal of the Canadian Biotechnology Strategy*. (Ottawa: the Task Force, February 1998), 1.

federal government. In taking these steps, I am able to analyze the discursive strategy surrounding the renewal of the Canadian Biotechnology Strategy.

8.2.2.1 Biotechnology as a Source of Economic and Social Well-Being

The process and the ideas defended by the government at the time were in continuation with previous orientations, with an added concern for public issues, now thought to be crucial for the commercialization of biotechnology products. Although the policy framework was claimed to be designed "to integrate social, ethical, health, economic, environmental and regulatory considerations", as the CBS vision illustrated, one idea subordinated the others: the idea that biotechnology would be the source of social, economic and environmental well-being for all Canadians.[30] Because it was to serve in the creation of a collective good, biotechnology deserved to continue to be supported by government interventions. The associated risk to this idea was that if Canada failed to reap the benefits of almost two decades of investments in biotechnology, much could be lost for Canadians in general.

Despite all that had been invested, the Canadian biotechnology industry had been and was still experiencing some major difficulties. According to the NBAC, in 1998, Canada was facing a situation where public investments in research could end up benefiting foreign firms if Canadian biotechnology companies could not take their product as far as possible in the commercialization phase. Canadian companies were encouraged to sell their intellectual properties, at an early stage of development, to bigger companies better placed to take in charge the development phase.[31] This tendency had already been observed in the late 1980s and early 1990s when many Canadian companies had been swallowed by multinationals: IAF and Allelix with UK's Glaxo, Quadralogic with Cyanamid, Bio-Mega had been swallowed by Boeringer and Connaught by Merieux.[32] Such changes were still happening in 1998. In Canada, companies that were

[30] "The CBS vision is: To enhance the quality of life of Canadians in terms of health, safety, the environment and social and economic development by positioning Canada as a responsible world leader in biotechnology." Government of Canada, The Canadian Biotechnology Strategy: An Ongoing Renewal Process, 8.

[31] Comité consultatif national de la biotechnologie, Assumer le leadership au prochain millénaire, sixième rapport (Ottawa : Service de distribution, Direction générale des communications d'Industrie Canada : 1998), 12 et 16.

[32] Yan Barcelo, « Le Canada peine pour entrer dans l'ère de la révolution biotechnologique, » Les Affaires 27 janvier 1990, p.14.

small had multiplied rapidly and tended to stay small: 20 to 30 in 1982 to 220 in 1990 and 500 in 1998. The small scale of most Canadian companies was creating a situation of a lack of human and financial resources to bring products to the market leaving them no choice but to seek alliances with giant firms who could bring funding, technological capacity and access to global markets.

The 1998 NBAC report was a call for action. The Canadian biotech industry was at the point of making a shift from research to commercialisation and particular attention had to be given to innovation, production, marketing and sales and the necessity to reduce commercial barriers. Given that capital flows to Canadian firms were strategic, the advisory committee recommended that fiscal incentives, which had been effective to encourage R&D, be adjusted to allow Canadian companies to take their discoveries as far as they could toward an end product and without penalty for seeking partnerships with bigger firms. Three priorities for action were identified by the NBAC: better access to science experts and administrators, increased access to capital funding for companies, and making Canada more attractive for international partnerships in biotechnology to develop distribution networks outside of Canada. Notwithstanding these difficulties, it seemed that for the NBAC the most important risk being run by Canadians was one of possibly failing to reap the benefits of new biotechnologies: *"La place que le Canada accordera à la biotechnologie et les efforts qu'il consacrera à son développement et à ses applications auront une influence déterminante sur l'avenir économique du pays et sur son rôle dans les affaires mondiales. »*[33] According to this logic, and although Canada was facing important difficulties and fierce international competition, it was argued that biotechnology deserved to be supported further. A lot was expected of biotechnology and this expectation was very clearly stated in one of the sectoral consultation documents that were distributed prior to meeting with stakeholders:

> *"The Strategy must also reflect Canada's role as a trading nation, in supporting Canada's access to foreign markets while giving foreign products that meet Canadian standards access to Canadian markets. Agricultural exports totalled almost $20 billion in 1996. This strong growth is expected to continue and, some suggest, could represent an estimated 4% of world export trade for agricultural products, a level last enjoyed in 1970s. Biotechnology will have a significant role to play in achieving these export goals if the policy framework is well structured today. Finally, the strategy must also capitalize and build on our competitive national business climate and predictable regulatory environment in order to attract new investment."*[34]

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[33] Comité consultatif national de la biotechnologie, Assumer le leardership …, 1998, 4.

[34] Government of Canada, Biotechnology in Agriculture and Agri-Food. A Consultation Document for the Renewal of the Biotechnology Strategy, February 1998, p.2.

As the vision of the renewed strategy shows, the government was still thinking that biotechnology would be the source of important benefits for all Canadians. This idea was not new but, with the renewal, the government ended up defending it with new strength and with a broader set of policy tools. Not only would a healthy biotechnology industry produce social and economic well-being for the population, but the government pushed further the idea that it would also be a tool to attain sustainable development. In sum, the main message left by the renewal of the strategy was that biotechnology was a solution more than a problem.

> *"Biotechnology can enhance our health and well-being, create jobs and economic growth and support environmental sustainability." (…) "Biotechnology is a powerful "enabling technology" with applications in many industrial sectors and holding much promise for the future. It has great potential to add to industrial efficiency, output and jobs, enhance the productivity and competitiveness of Canada's important natural resource sectors, safeguard the environment and enhance our quality of life through improved pharmaceuticals, diagnostic medicine and food production. (…) All Canadians – producers and consumers across the country, including people in smaller communities and rural areas – will benefit from the new transformation."*[35]

In the agri-food sector, the consequences were expected to be just as positive. For example: "The use of crops with modified traits contributes to environmental sustainability by reducing the need for chemical weed and pest control, enabling the practice of "no-till" agriculture and encouraging higher crop yields."[36]

It can be argued that all ten priorities of the CBS work plan, even those pertaining to socio-ethical and regulatory matters, were meant to answer these difficulties and meet the goals of removing commercial barriers and supporting the Canadian biotechnology industry. To increase competitiveness, the work plan suggested a further expansion of "Canada's R&D and science base; to develop human resources; to build sector strategies and action plans; to improve "policy-relevant data"; and to "facilitate measures to help accelerate the application and commercialization of new technologies" – including technology transfer and financing gaps. Other initiatives were directed toward the goal of reducing different commercial barriers, such as the anticipated rejection of biotechnology

[35] Government of Canada, The Canadian Biotechnology Strategy..., 2.

[36] Government of Canada, The Canadian Biotechnology Strategy..., 19. Other benefits are explained in the same page: the development of disease detection tools to protect food supply and the development of more efficient food processing tools.

products by consumers and delays in the processing of submissions by regulatory agencies. Improving market access domestically and internationally and improving the "domestic investment climate in biotechnology (and other knowledge-based sectors) by "modernizing Canada's intellectual property" were also part of the work plan developed for the new CBS to reduce commercial barriers.[37] Finally, Canada was also planning to be active in promoting its regulatory approach internationally, another way, it seemed, to ensure access to international markets.

8.2.22 International Leadership and Canadian Values

The renewal of the strategy saw an increasing tendency to propose that Canada was or should become a leader internationally when it comes to regulating and exporting biotechnology products. In fact, leadership was conceived as a way to secure both internal and external markets. Within Canada, this idea was to be used as a means to reinforce the credibility and legitimacy of decisions taken thus far by the federal government: if other countries think our regulatory framework is good, it must be. As for the external market, promoting "Canada's regulatory approach internationally" was clearly identified as one of the Federal government's consensually defined responsibilities during the renewal process.[38] Good stewardship, it was argued, was part of Canadian values and those values needed to be promoted on the international scene.

At this point, access to international markets was also strategic and access was partly linked to the acceptance of Canadian risk management procedures by importing countries. Since the early 1990s, biotechnology regulation had become an issue on the international scene. The early 1990s were marked by an increasing number of international forums where biotechnology was an issue and in which Canada was attempting to promote its views on regulation: United Nations' Biosafety Protocol, Codex Alimentarius Commission and Codex Alimentarius Committee on Food labelling, the WTO's discussions on Trade-related Aspects of intellectual Property (TRIPs), UNESCO and its Universal Declaration on the Human Genome and Human Rights.[39] Because it was thought important that "the international harmonization of regulatory systems reflects values and high standards for stewardship" the Canadian government had the intention to export its views with the hopes that it would help counter commercial barriers.[40]

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[37] Ibid., 14-17.
[38] Ibid., 10.
[39] Ibid., 6.
[40] Ibid., 16.

It thus was clear that market assess did not only depend on the possibility to sell products abroad but also on the opportunity to export Canada's risk management system. International negotiations were one way to achieve this goal but Canada was also hoping for a greater harmonization of regulatory systems by assisting developing countries in their regulatory choices. Consequently, the new strategy also planned to use Canada's international development assistance policies and programs as a propagation tool of the Canadian regulatory system and CBS vision.[41]

With growing controversy around GM food, access to the domestic market became an issue and the Canadian government needed more arguments to convince the population of the benefits of biotechnologies. The concept of leadership was tested in focus groups and during round table consultations. The conclusion was that Canadians in general liked the idea that Canada be a leader internationally, thrived on the idea that Canada was already enjoying international recognition for "responsible global leadership", and comforted themselves in the perception that Canada was doing far better than the US. [42] In the renewal document, the government took good note that the idea of international leadership was one that seemed to rally Canadians: *"The public opinion research showed strong support among Canadians to position the country as an international leader in biotechnology in terms of the quality of research and products as well as the stringency of standards and regulations. Respondents outlined that the CBS should build on our national tradition of responsible global leadership."* [43]

Among the proposed actions of the renewed strategy to build public confidence and awareness, the government reflected on the possibility to articulate and promote the CBS vision in Canada as well as abroad; it also proposed to celebrate Canadian achievements in biotechnology science and commercial applications.[44] It can be assumed that, using a self-proclaimed international credibility to increase its legitimacy domestically, Canada was counting on national pride to gain some public support for biotechnology. Public officials would later suggest that Canadians should pride themselves in Canada's science based approach as opposed to the protectionism and hysteria that characterised the European approach.

In sum, the new biotechnology strategy also carried the idea that Canadians should be reassured because the Canadian regulatory framework was a model for other countries and because Canada aspired to become a leader internationally in the field of

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[41] Ibid., 16.

[42] Environics Research Group, "Public Opinion Research for the renewal of the Canadian Biotechnology Strategy. "Executive Summary." Accessed 01/05/13 on Industry Canada Web site. http://www.strategis.ic.gc.ca/SSG/bh00239e.html

[43] Government of Canada. The Canadian Biotechnology Strategy..., 16.

[44] Ibid., 14.

biotechnology. This step would constitute a proof of the efficiency and quality of the Canadian regulatory process. International recognition of the quality and safety of Canadian food products should reassure the public and give them pride in the success of their country. After all, who does not want to see her or his country become a leader internationally? Perhaps it was assumed that a proud citizen was to be a happy and consenting citizen.

8.2.2.3 Environmental and health risks of biotechnologies do not need to be discussed publicly

Confident that biotechnology was to be a source of well-being for all Canadians and that Canada was to be an example to follow, a leader internationally because of good stewardship and effective regulation, environmental or health risks concerning the use of biotechnology and the release of biotechnology products into the environment however did not have to be discussed during the strategy renewal. It was felt that they were properly addressed by the existing regulatory process.

The regulatory framework was said to be excellent as it was, since it was based on the existing food regulations that had so far provided Canadians some of the safest food in the world. The Canadian regulatory approach was praised by the NBAC and many witnesses had declared to the Standing Committee on Agriculture and Agri-Food that Canada's regulatory system was not only respected in this country *"for providing a safe food system"* but also served as a model in other countries.[45] If any adjustments were needed, it would be to make it even more flexible to reduce costs associated with waiting and to reduce its impact on the competitiveness of the Canadian industry. For the NBAC, the upholding of a flexible regulatory framework was to be understood as a token of the government's will to support the development of biotechnology applications in the Canadian industry. NBAC's wishes were answered with the new strategy in which it was stated that: *"The federal government remains committed to maintaining Canada's high regulatory standards and international leadership for the protection of health and the environment. This will require the continuous improvement of the regulatory system – within the context of the existing federal regulatory framework – to accommodate the growing demands that new biotechnology applications will place on it."* [46]

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[45] Standing Committee on Agriculture and Agri-Food, Capturing the Advantage: Agricultural Biotechnology in the New Millennium (Ottawa: the Standing Committee, May 1998), 12.

[46] Government of Canada. The Canadian Biotechnology Strategy..., 15.

One of the key themes announced by the work plan indeed concerned the improvement of regulation "to protect health and the environment." But if the government acknowledged that improvements were necessary, it also thought that the nature of these improvements should remain within the existing regulatory framework and should be made to "accommodate the growing demands that new biotechnology applications" would place on it. Among the possible actions, one can read: "identify options to make the regulatory system more efficient, effective, responsive and predictable, using tools such as international benchmarking, performance standards and monitoring; improve international and domestic regulatory cooperation, harmonization and related R and D programs." If "generating the scientific knowledge and information needed to support biotechnology regulatory decisions" was identified as another possible action, it was also suggested that the regulatory environment would be improved by providing the "general public with clear, timely information on regulatory processes, decisions and enforcement activities."[47]

During the public consultations that preceded the renewal, no or very little discursive space was left to those who wished to approach the question of risks related to the use of biotechnology and genetic engineering. Firstly, the broad definition and general approach of the problem was making it very difficult to attract attention and ask for special time resources to be devoted to a subset of more precise and specialized questions. This broad approach was also making it difficult to contest the claim that genetic engineering was to create wealth and well-being, one of the premises of the strategy renewal documents. During the consultation process, NGOs with all types of concerns ended up discussing broad questions within poorly balanced stakeholder groups where industries accounted for approximately half of the participants. And a public opinion survey and focus groups were designed foremost to test acceptance of GM products and satisfaction of citizens with the government's role and actions.

For Susan Sherwin, who examined the consultation documents that were sent to the participants prior to the round tables the "negative dimension of the public interest" was simply avoided as the government focused on the "positive dimension". According to her, it indicated clearly that the government was concerned at the time with maximizing the benefits of biotechnology for the Canadian citizens – what she calls the "positive dimension of public interest", and simply avoided talking about the "negative dimension of public interest" that are risks, possible harms and dangers.

> *"The tone of the Consultation documents makes it clear that the Canadian government is preoccupied by its responsibility to attend to the positive dimension of the public interest. The documents insist that a strong biotechnology policy will*

[47] Ibid., 15.

> *benefit Canadians and thereby serve the positive dimension of its regard for the public interest. (…) In its implicit interpretation of the public interest as residing with a policy that maximizes the benefits of biotechnology, the Biotechnology task force has chosen to "accentuate the positive" and to largely ignore the negative possibilities of biotechnology development. Indeed, as noted above, the consultation documents are filled with examples of the possible benefits that will flow from biotechnology; they make no explicit reference to the potential harms. Even the post-consultation document, while reporting on the wariness expressed by Canadians regarding the risks of some biotechnologies, speaks primarily of "gaps in consumer awareness and understanding", not of actual hazards associated with some technologies."*[48]

The Canadian government, argues Sherwin, chose to promote advantages of biotechnology and in so doing; it placed the burden of proof on those who would like to see biotechnologies limited in their development.[49] But, during the renewal, those did not get any discursive space to put forward their arguments. Since risks were well taken care of through existing regulations, the problem to be solved, according to the authorities, was one of consumer awareness and understanding.

8.2.2.4 Consumers will trust and accept biotechnology products if they are better informed and if they can express their social and ethical concerns

The Canadian government was however also very well aware of the increasing public uproar in Canada and abroad. In the past years, mainly through parliamentary hearings, the regulatory process had been severely questioned along with the goals and motivations of the federal government. But, thanks to little media exposure, public opinion was still not galvanized and surveys were showing that a large segment of the Canadian population could still be convinced of the virtues of biotechnology. So far, apart from the controversies over rBST and, to a lesser extent, the story of the new leaf potato, biotechnology had mostly been treated by the press as a business story.[50]

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[48] Susan Sherwin, Towards and Adequate Ethical Framework for Setting Biotechnology Policy, prepared for the Canadian Biotechnology Advisory Committee, January 2001, 14-15.

[49] Sherwin, 14.

[50] Conclusions drawn from the examination of biotechnology coverage by la Press and the Globe and Mail. See appendix 3 for press review. An analysis of press coverage by Stephen Strauss reaches similar conclusions: From 1977 to 1996, he evaluated that in Canada 2/3 of articles on biotechnology were

Consequently, it was felt that, if the regulatory process was properly explained to the public and if a dialogue was established that allowed citizens to express their socio-ethical considerations, public confidence would be maintained or recovered.

At the time of the renewal, it was admitted by economic actors that public confidence, as well as social and ethical issues were becoming crucial factors in public acceptance of biotechnology products. Public dialogue, information and communication, it was argued, were the key to making consumers confident and to a greater acceptance of biotechnology products. This theme, as will be shown, was the object of a lot of attention all through the strategy renewal.

According to Susan Sherwin, an examination of stakeholder consultation documents used by the Canadian Biotechnology Secretariat shows, "the importance of supporting consumers' informed choice in the use of biotechnology [was] described as central to the entire consultation process…" And, on the CBS' own admittance, "consumer confidence and comfort with new DNA-based technologies" was considered a key question.[51] The government did acknowledge the fact that Canadians were concerned by risks related to biotechnologies. But it was also clear that, for the authorities, risks were not the real problem; the problem was with consumers' perception of risks. Special attention thus had to be devoted to the gaps in consumer awareness and understanding of biotechnologies, the cause of this erroneous perception. The public needed to be reassured. Better knowledge of evaluation processes and better understanding of the technology should partly solve the problem.

The objectives announced in the new biotechnology strategy confirmed this goal. "Building public confidence and awareness, and communicating accurate, balanced, easy-to-understand information to Canadians" was one of the 10 key themes developed in the CBS Work Plan. This objective was supported by a list of possible actions that suggested that Canada should be proactive in communicating information to the public and that the private sector should play a role. It included the development of a "communication strategy to inform Canadians about the regulatory system and other biotechnology-related activities"; "work with public and private sector partners to coordinate and enhance respective information and public education function"; "promote research in and awareness of the ethical, legal and social issues associated with biotechnology". Furthermore, it was probably assumed that to "celebrate and promote the CBS vision in Canada and abroad" and to "celebrate Canadian achievements in biotechnology science

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in the business section. Stephen Strauss, "Biotechnology and the Media," in Biotechnology and the Consumer, eds Bartha-Maria Knoppers and Alan Mathios, (Dordrecht: Kluwer Academic Publishers, 1998), 277-308.

[51] Sherwin, 14-15.

and commercial applications" would not only contribute to a better understanding of the technology and the regulatory process. It would also contribute to creating a feeling of pride towards Canadian achievements in biotechnology. On the regulatory side, it was also suggested that to "provide the general public with clear, timely information on regulatory processes, decisions and enforcement activities" would participate in the improvement of the regulatory system.[52]

In the more specific case of agriculture and agri-food, two out of six policy objectives concerned public information and confidence: "to ensure the public has access to information regarding agricultural products derived from biotechnology" and "to strengthen public confidence in the health, safety and efficacy evaluations conducted by government." To achieve these objectives, the government was considering the possibility to increase the public's awareness and understanding of the regulatory system and to create a greater transparency in regulatory activities.[53]

Finally, there was also, on the part of the government, the recognition that the public needed a space to express itself on "[T]he very real and legitimate interests" it had in "questions related to socio-economic and ethical issues raised by this technology."[54] One of the main actions taken by the government was to create the CBAC. In replacing the NBAC, the CBAC was to be composed of independent experts and an important part of its mandate was to raise public awareness and establish a dialogue with Canadians.

The independence of the CBAC was, however, theoretically compromised by the fact that its members were nominated by the Chair of the Biotechnology Ministerial Coordinating Committee (BMCC), which was the Minister of Industry, on the basis of recommendations from the Chair of the CBAC, himself appointed by the Minister of Industry. Even though the nomination process was open to the public, detractors argued that the composition of the CBAC was biased. Furthermore, the fact that CBAC participants were being appointed on the basis of individual merit rather than as representatives of interest groups[55] could very well seem like a convenient way to ignore the imbalance of participation in favour of industry. The absence of remuneration, claimed by some to favour independence, also served to discourage many NGOs to participate. CBAC's independence could be further questioned by the fact that the initial work plan was discussed with the BMCC and that the government financed its activities. The creation of the CBAC nonetheless served to argue that more in depth

[52] Government of Canada, The Canadian Biotechnology Strategy..., 14-15.

[53] Government of Canada, Biotechnology in Agriculture and Agri-Food. A consultation Document for the Renewal of the Canadian Biotechnology Strategy (Ottawa: the Biotechnology Secretariat, February 1998), 3 and 7.

[54] Government of Canada, Biotechnology in Agriculture and Agri-Food, 9.

[55] Government of Canada, The Canadian Biotechnology Strategy..., 8.

questioning would be continued after the renewal and that the government would, from now on, take public opinion into serious consideration. In the following years, CBAC did sponsor independent scientists to produce in-depth analysis covering different and sometimes controversial aspects of biotechnologies.

8.3 Conclusion

The contrast between the 1998 consultations of the biotechnology strategy renewal in Canada and the 1998 citizen's conference in France is stunning. Democratic qualities of these two consultation processes apparently did not have the same weight in both countries where consultations ended up serving two rather different discursive strategies.

In Canada, the responsibility of the public consultations was ultimately put in the hands of the ministry of Industry and carried out by the public service, with no direct involvement of the parliament[56]. In France, for legitimacy's sake, the consultation process was put in the hands of a parliamentary committee specialized in scientific and technological questions (OPECST) which sought the help of a scientific panel to prepare the conference. Also, conclusions of the citizen's conference were included in the OPECST report to give it more legitimacy.

What is more, Canadian consultations carefully avoided any discussion of controversial issues. Biotechnology was discussed globally, thus diluting concerns over GMOs and increasing the complexity of the issues to be discussed. In very little time, participants in the round tables had to tackle a very broad agenda. Themes of discussion were imposed; the absence of some important players and the imbalance of representation were ignored in the final report. Consultation of the population was made through surveys and focus groups with the apparent goal to better understand how and what to communicate to the population in order to reassure them. Confrontation was avoided as much as possible with careful avoidance of any controversial issues such as labelling, CEPA's role or the evaluation processes. Apart from the economic risks of being left behind, participants were not invited to discuss risks.

In France, the debate was focused on the GMO issue, perhaps to prevent other sectors of application to become the object of controversy. All important players were met during private hearings that were able to reach a certain balance of participation

[56] Parliamentary hearings on the subject were carefully ignored during the consultations.

between science, industries and NGOs. Conflicting views were opposed in public debates. Themes to be discussed by citizens were not imposed by the government and covered all types of risks as well as the regulatory framework. Citizens were reported to have been a true part of the discussion that included the confrontation of opposing views.

The Canadian government knew, at the time, that GMOs had the potential to create huge opposition movements that could have forced it to account for existing orientations, previous decisions and already numerous authorisations. Opponents had multiplied over the years and NGOs from all horizons (women, environment, consumers and religious groups to name a few) were starting to be mobilized by the issue. The Canadian government had been warned that, henceforth, policies would need to be justified. With a strong and admitted will to continue supporting biotechnology development in Canada, the goal of the government through these consultations was to keep a certain control over the debate and to increase the legitimacy of the new biotechnology strategy. As was shown, what Canada was really seeking was to learn how to inform and convince the population of the benefits biotechnology would bring while avoiding any discussion of the risks. Ultimately, it seems that the Canadian government was interested in putting together an event that would allow it to claim that the public and all interested parties had been consulted, whatever the type or quality of these consultations and even though discussions had carefully kept away from all controversial issues. It can be argued that the Canadian consultations were more public communication and public relation efforts at keeping existing orientations and avoiding the raising of public awareness at controversial aspects. In so doing, Canada was lowering the threat of institutional risks, and ultimately avoiding previous decisions and institutional arrangements from being further scrutinized by the media. Attention was given to those voices supporting existing orientations, while the work done during parliamentary hearings and conflicting opinions were again ignored.

For the French government which was already in the middle of a public controversy over GMOs, the goal was to regain a certain control over the debate by allowing the expression of middle ground opinions. Authorities were aware that the consultations had to meet certain standards. Otherwise, it would have been the object of even more controversy. French authorities could not afford further loss of credibility and legitimacy and thus raising further the level of institutional risk. They needed middle ground opinions to be expressed in order to center the public debate. This was probably well understood by those who organised the 1998 consultations since opposition to GMOs had already taken a lot of media attention. Drawing on the tainted blood experience where government officials were held liable, the government also needed a way to decrease the risks of being blamed in case any health or environmental problems were to occur. It needed the input of the population and it needed science to listen to citizen's concerns. In a sense, the 1998 citizens' conference was a case where

institutional risks pushed a government toward more careful and democratic process in decision making.

The French government was also hoping that more information would convince citizens that risks of GMOs had been exaggerated by opponents. However, to reach out to ordinary citizens and in order to have middle range opinions expressed publicly, France used a strategy of equivalence whose goal was to rally a majority of citizens behind a moderate stance to counterbalance and marginalize the impact of radical voices. The approach was different in Canada where controlling themes to be discussed during the consultations, ignoring opposing voices, giving very little to no space to rivals to express themselves, and using a pro-active approach to communication allowed the government to keep a hegemonic hold on discourse.

CHAPTER NINE

A Network Approach to Discourse Analysis: France and Canada between 1980 And 1994

This chapter draws a comparative portrait of the French and Canadian discursive community of actors that contributed to the evolution of public discourse about genetic engineering and GMOs. The term "discursive community" is here borrowed from the concept of policy community and refers to a community of actors interacting and having an impact on the evolution of discourse on a given topic. Groups of actors are examined for their role in rallying others to their own vision and to their own risk definitions.

This study espouses discourse theory as a way to move toward a better understanding of the role of risks in political change where discourse is understood as a process of meaning formation that is not fixed, never final. Accordingly, discourse evolves and is influenced with the different definitions of reality propagated by actors and institutions. In this evolution of the meaning, some gain and some lose influence. The capacity to rally subjects and structures to a given vision is both determinant and dependent on that degree of influence. In this process, other discourses are the very limits and determinants of a given discourse. An examination of the evolution of the community of actors having influenced biotechnology policies and regulations will thus be revealing of this process.

The role and evolution of four groups of actors on discourse building is here examined from 1980 to 2002. These four groups consist of the scientific community, the agri-food industry sector, NGOs opposing GMOs, and, last but not least, the government - including both the cabinet and the public administration.[1] This analysis shows how different the role of these groups was in the final outcome and how both governments had crucial but very different impacts in discourse building. It also highlights how different the level of cohesion and forms of alliances were between actors and groups of actors.

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[1] Because of their heterogeneity, farmers associations were not analysed as a separate group. Some associations remained neutral, some sided with the agri-food industry and others sided with NGOs opposing GMOs. When relevant, these associations were individually included in the analysis as part of one of the four groups defined for this study.

In Canada, a pro-active approach to managing institutional risks, great cohesion between actors of the industrial sector and a close partnership between the government and the industry have contributed to keep new players out and allowed the government to keep a hegemonic hold on the discourse. In France, reactions of the government to institutional risks increased the transparency and democratic qualities of the regulatory framework but, in so doing, regulatory authorities became the subject of even more scrutiny while opponents to GMOs gained in credibility.

9.1Governments and Governance Styles

The government is a very powerful actor in discourse building. Not only does it participate in discourse formation by way of positions taken publicly by members of the cabinet, it also participates indirectly in discourse by its choice of public policy tools. Its capacity to influence public opinion is unsurpassed by any other group. Even though there are, in theory, democratic and ethical limits to this capacity, consultative and communication activities could be occasions for the government to impose a certain interpretation of an issue. In addition, the very structure of governance widely determines who, within and outside the government, has power and influence. The choice of a regulatory framework, of public policy tools and the way these are implemented not only sends messages as to the nature of the problem and its seriousness; it also impacts on opportunities different groups have to influence public discourse and policy outcomes. This study shows that, in trying to influence discourse about GMOs, French and Canadian national governments have used their institutional, regulatory and communication capacities in quite different ways.

In the following pages, the role of government in discourse building will be examined along three lines: the structure of governance and its impact on network and discourse building; the impact of the regulatory framework on the general narrative; and the direct participation of governments in discourse building through information or communication strategies.

9.1.1 The Structure of Governance

In 1994, the Canadian regulatory framework for biotechnology was such that three federal departments administered the essence of the legislation applicable to biotechnology: Agriculture and Agri-Food Canada, Health Canada and Environment Canada. In reality, however, Agriculture and Agri-Food Canada (AAFC) and Health

Canada (HC) had leading regulatory roles while Environment Canada was still on standby. Two factors explained this temporary exclusion of the department in charge of the Environment. First, most biotechnology products being developed at the time were health or agricultural products regulated under existing statutes administered by either AAFC or HC. In fact, when it came to agricultural products, Agriculture Canada and Health Canada were the only departments concerned: *"…Agriculture and Agri-Food Canada is responsible for registering new traditional and biotech plant varieties, pest control products, fertilizers, animal feeds, and veterinary biologics of vaccines. Health Canada's responsibilities with respect to the regulation of agricultural products of biotechnology relate to human consumption of food."* [2]

Second, under the Canadian Environmental Protection Act (CEPA), Environment Canada (EC) had the responsibility for the regulation of "substances new to Canada" but, all previous proposals by the Department having been rejected by Cabinet, the regulatory requirements for biotechnology products under CEPA were still in the process of being elaborated at the end of 1994. It is however through this process of defining regulations for biotechnology products that EC's role was the most important during this period. By submitting these proposals to the public for comment, EC contributed to open the debate to actors outside of the NBAC's circle to environmental defence groups in particular. These proposals, as was pointed out in Chapter 4 and 6, were the start of the participation of a variety of actors previously ignored by the process of defining a biotechnology strategy. It is, however, important to remember that the control of biotechnology products was only a small part of the CEPA. This policy responsibility was diluted in a law that embraced a great variety of environmental challenges. Furthermore, the government had made it clear that environmental goals pursued by CEPA would be subjected to commercial objectives; industrial development was an important overriding objective. While promoting environmental protection, CEPA also had to help Canada become more competitive by favouring new technologies and innovation.

Finally, the work that should have led to the elaboration and adoption of notification regulations for biotechnology products under the new substances section of CEPA lasted almost a decade. In the end, the equivalency clause that could have set minimal requirements for any other regulations related to biotechnology was weakened to such a level that CEPA became a safety net for those products that were not and would not be covered by any other legislation or regulation. Responsibilities for the better part of GMOs assessment were to remain a responsibility of Agriculture Canada and Health

[2]Standing Committee on Agriculture and Agri-Food, "rbST in Canada," April 1994, in House of Commons, Proceedings and Evidence of the Standing Committee on Agriculture and Food Issue 13 (Ottawa, House of Commons, Thursday 24 March 1994), 9.

Canada. Parliamentary reports on the subject and numerous objections from Canadian NGOs who had contributed since the beginning to this reflection were simply ignored. Finally, and further increasing the responsibilities and powers of AC in biotechnology issues, the creation of the Canadian Food Inspection Agency in 1996 concentrated federal food inspection and animal and plant health services into a semi-independent agency mostly under the control of Agriculture Canada.

Industry Canada (IC), for its part, did not have direct regulatory responsibilities. Nevertheless, it played a major role in coordinating efforts for the development of biotechnologies in Canada. It had "the mandate to foster the industrial development of biotechnology in Canada" and therefore acted "as an advocate for industry with other federal departments who ha[d] a direct interest in supporting and/or regulating biotechnology."[3] This department has been active since the beginning, with the Ministry of State for Science and Technology (MOSST)[4] which was under its administrative supervision. The MOSST, mostly with the creation of the Task Force on Biotechnology, was central to the discussion conducive to the elaboration and implementation of the 1983 National Biotechnology Strategy. As the supervisor of science and technology initiatives, Industry Canada was also responsible for the Strategic Technologies Program that supported alliances between the industry sector and universities working on the development of commercial biotechnology as well as of other initiatives to encourage research in this area. In Canada, the Industry minister was also responsible for consumer issues, putting consumer issues at a disadvantage in relation to other branches of IC such as the Life Science branch which was better staffed and financed.[5] As Doern pointed out, Industry Canada was the only department with a clear mandate concerning biotechnology. It had a predominant coordinating role in policy development across government departments and acted as a catalyst in the absence of a central regulatory agency.[6]

> *"Industry Canada [and the MOSST before that] administers the National Biotechnology Strategy and chairs the Interdepartmental Committee on Biotechnology. The department also provides secretariat services for various*

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[3] Standing Committee on Environment and Sustainable Development, Biotechnology Regulation in Canada, A Matter of Public Confidence (Ottawa: House of Commons, November 1996) section 2.2.5. www.parl.gc.ca/committees352/sus/reports/03_1996-11

[4] The MOSST was under the administrative supervision of Industry Canada before it became Industry, Science and Technology Canada in 1987.

[5] X, interview by author, Industry Canada, Ottawa, 22February 2002.

[6] Bruce Doern and Heather Sheehy, "The Federal Biotechnology Regulatory System: A Commentary on an Institutional Work in Progress," in Biotechnology and the Consumer, eds. Bartha M. Knoppers and Alan Mathios (Dordrecht: Kluwer Academic Publishers, 1999) 318- 327.

> *other important committees, including the National Biotechnology Advisory Committee."* [7]

The NBAC, whose secretariat was provided by Industry Canada, reported to the *Interdepartmental Committee on Biotechnology* that Industry Canada chaired. Industry Canada was thus a focal point for the NBAC. Created by the National Biotechnology Strategy and with a composition that gave an enviable representation to corporations and scientific experts, the NBAC had the mandate to advise the MOSST and the achieved ambition to serve as a focal point for major biotechnology issues.

The NBAC was the only consultative body to the Canadian government on the subject at the time and for a long time. The National Research Council (NRC), the NSERC and the Medical Research Council (MRC) were consistently represented on the NBAC. But since they were asked to participate on a Committee whose mandate was clearly to advise government on ways to promote biotechnology applications and because these institutions had a clear mandate to support industrial development through research and development, their NBAC participation did not distract the consultative committee from its main orientations and objectives.[8] We have to wait until 1998 for the NBAC to be transformed into the CBAC which had the duty to include the participation of a wider range of interests and the mandate to include issues beyond economic, scientific and regulatory aspects of biotechnology.

In France, socio-ethical concerns were considered much earlier. Being horizontal in nature, the issue of biotechnology had led, at first, to a scattering of responsibilities within the French public administration. Pelissolo, in its 1980 report, identified eight ministerial departments in six different ministries (Health, Education, Universities, Industries, Environment and Agriculture) who had sector-based or horizontal competence in the field of biotechnology. Contrary to Canada which very early adopted a policy (NBS), created a structure of policy coordination and special consultative committees (NBAC and IBC), there was, in France during this period, no *ad hoc* structure dedicated solely to biotechnology. First, there were no "coordinating bodies to orchestrate and stimulate national actions and initiatives in the field" as recommended by Pelissolo in

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[7] Standing Committee on Environment and Sustainable Development, Biotechnology Regulation in Canada Sect.2.2.5. The National Biotechnology Strategy was later also authorized to provide founding for the elaboration of guidelines for the evaluation of biotechnology products. See also Bakshish S. Samagh, " Animal Foods – Proposed Guidelines for Transgenic Animals," In Processing of a Workshop on biotechnology (Ottawa, 29 march 1993), 72.

[8] In the case of the NRC, see Conseil national de recherche du Canada, Brochure du programme de biotechnologie, 1992. p. 2.

1981.[9] Because of its role in the management of biotechnology research programs, and because it was instrumental in activating a debate on biotechnology, the Direction Générale de la Recherche, de la Science et de la Technologie (DGRST) assumed *de facto* a certain leadership through its work on the elaboration and implementation of research guidelines; but its mandate was much broader than biotechnology. Second, biotechnologies were included into existing industrial development plans, but were not selected out as the sole object of a policy. Of course, biotechnology was designated as one of France's seven priorities and selected as one of the two highest priorities of the *Programme mobilisateur* in 1982. But measures to encourage its development were not articulated into a policy as was the case in Canada with the National Biotechnology Strategy.

In France, advisory bodies contributed to give the issue of biotechnology its specificity and visibility. The 1990 directives and the 1992 law reinforced this tendency. According to Pierre-Benoit Joly, it gave GMOs a specific judicial regime and an official existence that would progressively be an instrument that would give more visibility to GMOs in the public space.[10] In Canada, during this same time period, there was great care to avoid giving genetic engineering any specificity with a legal definition that recognized the particularities of new biotechnologies.

In France, biotechnology was in most cases a shared but segmented responsibility until 1992. Concerned ministries were in charge of different laws and programs directly or indirectly related to new biotechnologies but they had little contact with each other on this issue. For example, until the 1992 law, the Ministry of Agriculture was the sole authority in charge of the Commission du genie biomoléculaire (CGB), hosting its secretariat and nominating all its members. The Research Department was in a similar situation, hosting the *Commission de classement*, nominating all the members of the *Commission du genie génétique* (CGG) and hosting its secretariat. The same was true of the Ministry of Health which was in charge of all aspects of its *Commissions d'Autorisation de Mise en Marché.* Changes brought about by the *Loi du 13 juillet 1992* gave other ministries a greater say in the making and functioning of the CGB and the CGG. Biotechnology became even more horizontal and the Environment Ministry and the parliament both gained a greater influence.

But the minister in charge of Agriculture most likely remained the one calling the shots, mainly because this ministry was still hosting the secretariat of the CGB and the

[9] Pelissolo, p.38-39and 57.

[10] Pierre-Benoit Joly, « Nouvelles technologies, nouvel environnement. Les OGM dans l'agriculture et dans l'alimentation : le face à face États-Unis/Europe, » Cahiers français, Science et Société no.294 (Paris : La documentation française, janvier - février 2000), p.54.

Comité de Biovigilance which allowed it to keep control of some of the information.[11] With the rise of the controversy surrounding the technology, however, the ministry in charge of Agriculture lost some influence to the ministry in charge of the Environment. GMOs became the cause of inter-ministerial battles and the topic became so politically explosive that, although it had so far been dealt with mostly at the level of the ministry of Agriculture, an interministerial committee was created with the Prime Minister himself having direct input on the issue.

> *"Le ministère de l'Agriculture a géré ce dossier presque entièrement avant et le ministère de l'Environnement a quand même gagné en influence. (...) Il y a un comité interministériel qui a été mis en place. (...) Concrètement, il y a deux personnes au cabinet Jospin qui regardent ce dossier de très très très près, ce qui n'était pas le cas il y a encore quelques années. »*[12]

In France, the creation of special advisory bodies (CGG and CGB), the European Directives and their transcription into the French law did contribute to attract some attention to the issue of genetic engineering. The tainted blood scandal and BSE crisis had created a context that had already somewhat eroded trust in expertise and the government. But the way the government handled the first authorisations of GMOs also did a lot to feed the debate.

9.1.2 Regulatory Adjustments and Discourse

The need for regulation of biotechnology products became more evident in the mid 1980s when products were getting ready to be tested in the environment and closer to be put on the market. Before 1990, biotechnologies in France and Canada were regulated by use of existing laws and regulations and, especially in the case of France, by the use of guidelines to complement the existing regulatory framework. France and Canada had both participated and agreed on the OECD's conclusions in 1986 that a case by case approach based on scientific evaluation and no specific legislation was desirable.[13] And both countries were pursuing a similar industrial development goal partly motivated by promises of wealth creation and fear of being left behind in the innovation race. But although both countries had adhered to the 1986 OECD's conclusions, they had to face different contexts that gradually took them along different regulatory paths.

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[11] X, France-Nature-Environment, interview by author, Paris, 7 December 2001.
[12] X, Plate-Forme UIPP-GNIS, interview by author, Paris, 21 November 2001.
[13] OCDE, Considérations de sécurité relatives à l'ADN recombiné (Paris : OCDE, 1986).

As was demonstrated in chapter 4, the French government was, from the beginning of this innovation race, more aware of and concerned by socio-ethical and environmental issues. Reports from independent and renowned scientists had pointed to the possibility that biotechnologies might be rejected by the public such as was the case with nuclear energy. In Canada, socio-ethical and even environmental issues, it seems, were never discussed by those advising the government. Only a closed circle of interested actors had the ear of decision-makers so that the main discourse concentrated on the awaited benefits of the technology in a wide range of sectors and on the need for more government investments. In Canada, the focus was on industrial development and on research applied to the development of new products with commercial applications.

Although France and Canada had, early in the 1980s, already started to act upon the need to encourage biotechnology research and development, they both reacted very differently to the need to adjust regulations to this new reality. While France had started making regulatory adjustments in the early 1980s, it was not until 1987 that the Canadian federal government officially started to reflect on regulatory options. In Canada, before the 1990s, adjustments were made informally within the public administration or were the object of discussions at a very technical level and within the very wide structure of CEPA. This informal operation within the bureaucracy contributed to keep the issue away from the public eye and the attention of the press. As observed by the Canadian Institute for Environmental Law and Policy (CIELAP), it also kept the issue away from the parliament: "Since there is no legislation, elected officials have never had a significant debate on the subject. Without parliamentary debate, public access to decision-making process is curtailed."[14] Comparatively, in France, the use of guidelines went hand in hand with adjustment of existing laws and the creation of special expert advisory bodies, the CGG and the CGB. Negotiations for European directives also served to open the debate to a wider set of actors, and prompted the active participation of the French parliament. Because of active opposition from environmentalists groups at the European level, it also favoured the extension of the debate to a wide set of environmental and ethical concerns that were not yet expressed in France. The European Directives and their transcription into the French law confirmed and formalized the message with a law specifically targeted at the issue and a legal definition of biotechnologies that acknowledged the "unnatural" aspect of the technology. With the French transcription of European directives, the Office parlementaire d'évaluation des choix scientifiques et technologiques (OPECST) would be represented on the CGB along with consumer and environmental defence groups.

[14] CIELAP, A Citizen's Guide to Biotechnology, March 2002, 35.

In contrast to France, Canada created, in 1983, the NBS and the NBAC and with it recognized the special economic importance of the stakes involved in the development of these technologies. This impulse toward the realisation of industrial and economic goals was, however, not counter-balanced by equal concerns for socio-ethical or environmental and health issues. In a way, it soon led to unquestionable domination in policy-making of the issues of research and industrial development. Adjustments of the legislative framework were periodically demanded by the Task Force (1981) and later by the NBAC (1988, 1991). But they were justified by referring to the risk of putting Canada at a disadvantage if legislation and regulations created obstacles to industrial development.[15] In its 1991 report, the NBAC seemed to be more concerned by the public perception of risks than by health or environmental risks themselves: "public perception of risks and benefits" was seen as important for the overall success of commercial applications of new biotechnologies in Canada. Regulatory aspects concerning the management and control of health and environmental risks related to biotechnology were only addressed superficially.

France, at the start of the 1990s, had already put in place and adjusted its regulatory and evaluating structures for the reality of new biotechnologies with special consideration for ethical and transparency issues. Yet, in Canada, no formal changes had been made to face this new challenge. This informal and ill defined regulatory framework had come to be called "the maze" by corporations having to deal with it. By 1987, there was a strong consensus in Canada in favour of the adoption of an effective and flexible regulatory framework, one that would, among other things, engender public confidence; make economic sense; and allow industry planning for development and commercialization. The government also expressed its preference for the use of existing legislation. Adjustments would thus mostly be achieved by way of regulatory changes that implied very little exposure to outside scrutiny, limited consultations with interested and informed players, and little involvement of the parliament. Examination of the Regulatory Impact Assessments produced for each regulatory modification showed that ethical and environmental issues were still remote from the government's priorities. Adjustments came late, after a significant number of products had already been approved.

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[15] "The development of an appropriate regulatory system which covers environmental introduction and use of such products will in large measure determine whether the commercial benefits from substantial private and public investments which have been made to date will be reaped in Canada." John R. Evans, Chairman's Transmittal letter and Statement to The regulation of Biotechnology: a Critical Issue for Canadian Research and Industrial Development, by National Biotechnology Advisory Committee (Ottawa: Ministry of Supply and Services, 1991), 3 "Federal regulations are a critical determinant of the cost and time required to bring a new biotechnology product to market. Current delays and regulatory uncertainties are discouraging new research and investments in commercial facilities, driving up the costs of innovation and undermining public confidence." NBAC, 1991.

9.1.3Communication, Information and Consultations

Participation of the government in discourse was not limited to organisational, legislative or regulatory choices. The party system, the role of the public administration, and the level of direct involvement in communication and information activities also explain why France and Canada had such different roles in discourse building between 1996 and 2002. Consultations, as was shown in chapter 8, can be used to orient the debate in a certain way; and information and communication strategies can be used as persuasion tools to impact public opinion. Of course, governments and public administrations can also directly participate in discourse building by way of the position they take publicly on an issue. This research shows that when it comes to biotechnologies, the strategies adopted and messages sent by the French and the Canadian governments were very different.

In France, the party system, because it is more open to the possibility of coalition government, allowed some members of the cabinet to publicly express diverging opinions. This aspect came to have an important impact when the controversy started. Indeed, the left coalition led by Lionel Jospin from June 1997 to 2002 included a member of the Green Party as minister of the Environment - Dominic Voynet - as well as deputies from the socialist and ecologist movements. This aspect of party and coalition politics allowed for public display of divergent views even from within the government and shattered any possibility for the government to present a united front on the issue. The government safely declared itself in favour of a precautionary approach and proceeded to ask for modifications to the Directives before any new GMO was introduced in France. This strategy of the French government contributed to raise questions as to the way the issue had been dealt with so far at both French and European levels. These questions later became an important element of the creation of institutional risks that left the French government on the defensive for the duration of the controversy. In France, after the rise of the controversy, proclaiming oneself in favour of biotechnologies became so politically risky that ministers traditionally in favour would simply avoid taking a position publicly.

The Canadian government did not have such a problem. In Canada, the party system and party discipline are such that they leave very little space for individual opinions to be expressed publicly. Members of the caucus, or of the cabinet, who would contest the official position, would expose themselves to serious consequences for their careers. This strict party discipline allowed the government to present the public with a very coherent and monolithic message about biotechnologies and GMOs. This message insisted heavily on the advantages of biotechnologies for all Canadians and downplayed risks. This message also recognized consumers' concerns for environmental and social consequences but never shared it. Members of the government and the Prime Minister

himself did not hesitate to publicly support biotechnologies.[16] As will be shown, the Canadian government had a very proactive approach to communication and information.

Contrary to France, the Canadian government also relied heavily on the public administration to spread the good news: biotechnology was a key enabling technology from which Canadians could expect important benefits in terms of wealth creation and well-being; and risks did not need further discussion because they were very well taken care off within the existing evaluation process.[17] The Canadian government allocated important resources to get this message through. Agriculture Canada produced leaflets to reassure and promote the use of GMOs in agriculture.[18] *Strategis*, Industry Canada's tool to promote biotechnology development and investment in Canada, circulated a highly favourable message to attract more investments. In addition, the information posted on the Canadian Food Inspection Agency's Office of Biotechnology was decried by opponents as pure propaganda in favour of biotechnologies (see Chapter 6). And so was this agency's involvement with the Food Biotechnology Communications Network (FBCN):

> *"One of the favourite recipients of CFIA biotech subsidies is the Food Biotechnology Communications Network (FBCN), which claims to be 'Canada's leading information source for balanced, science-based facts about food biotechnology and its impact on our food system. (...) The "growing Appetite" publication was financed by CFIA, although there is no recognition of the public agency's funding anywhere in the booklet. CFIA also funds FBCN's 1-800 information line, web site and other promotional materials.'"*[19]

Established in 1995, FBCN's goal was to communicate about risks, benefits, values and concerns related to biotechnology products. Self-proclaimed "Canada's

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[16]For example: John Manley, Minister of Industry, Speaking notes to Ottawa life Science Council National Conference and Exhibition, (Ottawa, November 17 1998) or Allan Rock, "Allan Rock Unveils Reports Recognizing Canada as World leader in Biotechnology," News Release, Toronto, June 9, 2002. See also Anne McIlroy, "Food produced in Canada safe: PM Chrétien offers assurances to French on genetically modified products," The Globe and Mail, 22 June 2000, A6.

[17] This message was also central to consultations conducive to the renewal of the biotechnology strategy in 1998. In Industry minister's own word, the government sought "through consultations, a vision that would capture biotechnology as a key enabling technology." John Manley, Minister of Industry, Speaking notes to Ottawa life Science Council National Conference and Exhibition, (Ottawa, November 17 1998).

[18] For example, the brochure by the Biotechnology Coordination Office, Biotechnology in Agriculture : Science for better living, (Ottawa, Agriculture Canada, 1993).

[19] Aaron Freeman, "Federal Government's Pro-Biotech Bias is Most Evident at CFIA," The Hill Times, 19 November, 2001.

leading information source for balanced, science-based facts about food biotechnology and its impact on food system"[20], the Food Biotechnology Communications Network owed its existence to public and private membership[21] and grants from the Agri-Food Trade 2000 program[22]. As the controversy was reaching a peak in Canada, the FBCN saw its income go from $187 000 in 1999 to $700 000 in 2000.[23] The government was attacked in the media for its financial support of the Network but also for CFIA's involvement with the network in the production of an information booklet: *A GROWING APPETITE FOR INFORMATION*.[24] The leaflet did briefly mention the position and argumentation of some of the biotechnology detractors in Canada. But it also carried some messages that the government was already trying to pass on about the expected benefits of the technology, the efficiency and reputation of the assessment system, and about the value of the position defended by Canada on labelling. A few months later, CFIA produced another booklet which was distributed in Canadian households "Food Safety and You", boasting about Canada's food safety system and providing readers with comforting information about the evaluation process applied to GMOs.[25] As this involvement of CFIA became known by the public, it became a source of embarrassment for the government which was accused of funding propaganda.[26]

For its part, the Canadian government relied a lot on surveys and focus groups to probe public opinion and orient its policies. This information was also used in collaboration with corporations to put together a communication and information strategy. The Canadian government, in support of the industry, was trying to understand how to make biotechnologies more acceptable to the consumers and how to remove this barrier to market introduction.

> *"In 1995, the Office of Consumer Affairs (OCA) assumed responsibility under the federal government's National Biotechnology Strategy to conduct surveys, focus groups, and other research to better understand consumer attitudes*

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[20] Food Biotechnology Communications Network, "About us", www.foodbiotech.org retrieved March 2001.

[21] CFIA and Monsanto, among others.

[22] Testimony by Dr. Gordon Surgeoner (Chair, Food Biotechnology Communications Network (Guelph)). Proceedings and Evidence of the Standing Committee on Agriculture and Agri-Food, Tuesday, May 12, 1998

[23] FBCN, Financial Statements for the Year Ended March 31, 2000.

[24] Food Biotechnology Communications Network, Brochure, A Growing Appetite for Information. Food Biotechnology in Canada. November 1999.

[25] Government of Canada, Brochure, Food Safety and You, June 2000.

[26] Mark Abley, "Biotech lobby got Millions from Ottawa," The Gazette, Monday February 28, 2000, sec. A, p. 1. Lyle Stewart, Food Agency Accused of Funding Propaganda, Montreal Gazette, April 2, 2000. CBC the National, Food Agency Accused of Publishing Propaganda, April 7, 2000.

> *towards biotechnology. After an in-depth review of existing surveys and following focus groups and consultations with partners inside and outside government, the Office decided that the next step should involve the development of an improved analytical framework to guide future work on consumer attitudes and public confidence regarding biotechnology."*[27]

For example, in Canada, the Biotechnology Assistant Deputy Minister Coordinating Committee (BACC) commissioned a series of 4 public opinion studies between 1999 and 2001, including surveys and focus groups, by two private research and communications firms: Pollara, and Earnscliffe. These were designed to investigate public sentiment over a range of biotechnology issues (overall awareness, perceived risks, benefits and drawbacks, government performance) and to test communications material and information.[28] Focus groups and surveys done as part of the consultation efforts that accompanied the NBS renewal served similar goals (see chapter 8).

Furthermore, in partnership with the industry, it appeared that the Canadian government was also directly involved in communications activities. In an article published in the Montreal Gazette, Industry Canada was said to have direct involvement in the elaboration of a communications strategy in collaboration with the industry. The Canadian Institute of Biotechnology was also said to have been "working under contract for a number of government departments to complete projects in such areas as 'networking, communications, public awareness and education'".[29] Furthermore, "An Industry Canada funded study was carried out to examine the biotechnology communications strategies and outreach activities undertaken by the Canadian biotechnology community since 1992. The goal was to provide recommendations for the improvement of public awareness about biotechnology."[30]

In 1998, CFIA sponsored the National Institute of Nutrition (NIN), an industry-funded NGO, to conduct an "independent study on the voluntary labelling of foods derived though biotechnology." Although CFIA announced that the study's goal was to

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[27] Marc Legault et al, "Integration Document, Biotechnology, the Consumer and the Canadian marketplace," Biotechnology and the Consumer, ed. Knoppers and Mathios (Dordrecht: Kluwer Academic Publishing, 1998), 458-459.

[28] Pollara and Earnscliffe, Public Opinion Research into Biotechnology Issues, Fourth Wave, Executive Summary, May 2001.

[29] Mark Abley, "Biotech lobby got Millions from Ottawa," The Gazette, Monday February 28, 2000, A1.

[30] Retrieved in Fall 1999 from BIOTECanada's Web site, this statement was said to have been put out of the web page soon after. In Mark Abley, "Biotech lobby got Millions from Ottawa", The Gazette, Monday February 28, 2000, p.A1.

provide "insight into consumers' understanding of potential labelling messages and was presented as a symbol of the "government's commitment to an open dialogue with the public," a quick look at the methodology tells a different story. In practice, many research questions were oriented in a way to provide data on informational factors that could influence consumer acceptance and trust in biotechnology. [31] In sum, it was another study that would equip the government and the industry with tools to elaborate communication strategies to facilitate consumer acceptance and remove another barrier to market introduction.

Finally, on some occasions, communication officers from CFIA or Health Canada would directly take part in the debate by replying in the media to contradict any criticism of the evaluation process and going as far as to discredit biotechnology detractors (see press review). In France, our research has shown no evidence of such behaviour on the part of civil servants.

Contrasting with Canada, even messages in French governmental web pages were a lot more neutral and admitted the possibility of risks. Once the controversy started, the French government did not deny the possibility of risks and admitted the necessity of special control measures when it came to GMOs. Corporations in France were on their own when it came to communication and outreach activities. For the period between 1996 to 2002, we could not find any evidence of governmental communication in favour of biotechnologies nor of any partnership between the government and the industry to promote biotechnologies.

Yet, the French government was not indifferent to public opinion and very early on paid attention to the controversial aspects of biotechnology. In the beginning of the 1980s, public opinion was already a concern for the French government. In 1979, professors Gros, Jacob and Royer made reference to a changing social context where health had come to be perceived as a right, where the population was increasingly preoccupied by quality of life, and where technological and industrial abuses would be

[31] Goals of research questions included: "explore the importance of acceptable terminology on consumer acceptance and trust" and determine how information about biotechnology and the regulatory process can influence consumers' understanding and attitudes. Among the key research questions one could find: "What factors influence consumer thinking/purchase behaviour when they read label statements concerning genetically engineered foods?" "What is the impact of knowledge of regulatory controls and sources of information on consumers' perceptions of products and purchase decisions?" "What factors influence consumer attitudes and purchase behaviour when they are reacting to or assimilating increased information about biotechnology?" In Canadian Food Inspection Agency, Office of Biotechnology, Voluntary Labelling of Foods from Biotechnology, Report on a Qualitative Study Among Canadian Consumers by the National Institute of Nutrition, (Ottawa: National Institute on Nutrition, 1999). Retrieved March 2001. http://www.cfia-acia.agr.ca

less and less tolerated. Under these circumstances, they foresaw that the role of life sciences would most likely be questioned in the coming years, making it necessary to bring closer together social and ethical aspirations with developments in science. To achieve this goal, they made a plea in favour of public information and education that would lead to a dialogue inclusive of different social and political groups. « Il faudra surtout une réflexion approfondie et continue par un groupe formé, non seulement de scientifiques et de politiques, mais de personnes de compétences variées. Ici, planification sociale et impératif éthique se rejoignent. »[32]

The Creation of the *Groupe de réflexion sur la sécurité des application industrielles des biotechnologies* by the Industry Minister in 1981 was a step in the direction of more inclusiveness, with an entire section of the report dedicated to the study of public opinion and the participation of four journalists as members of the group.[33] Although the public was not invited to participate directly until later, French authorities tried at first to make some space for the participation of the press. Furthermore, in its first composition, the *Collège de la prevention des risques technologiques* included the information director of a television channel. Representatives of the media were also invited to participate in the "Risk management in biotechnology" colloquium organized by ADEBIO, the French association for the development of bio-industry. In France, it seems that, since the beginning, the media were seen as an element of the solution rather than as a problem. The press review has also shown a more intense media exposure of the French population since the very beginning.[34] Perhaps this exposure was a consequence of this attitude of openness towards the media in the early stages of biotechnology development.

France too was interested in the evolution of the public opinion but it had another approach. Already plunged into a significant controversy over GMOs, it did rely on surveys to better understand the reaction of the French public. For example, Eurobaromètres were a source of periodical measurement of the French public opinion towards biotechnologies and GMOs as well as a means to compare its evolution with other European countries. But, contrasting greatly with Canada, no evidence was found of collaboration between the government and the industry to use these data and build it into a communication strategy. Corporations in France seemed to be pretty much on their own when it came to informing and communicating with consumers. In addition, since the French parliament had been scrutinizing the question ever since the work over the European directives started, the government already had at its disposal a series of

[32] Gros, Jacob et Royer, p.272-280.

[33] Reporters were from written and electronic media: Le Monde, Nouvel Observateur, Europe, and Antenne II.

[34] See appendixes 3 and 4.

parliamentary reports, some from the OPECST specialized in science and technology issues. Also, with reports commissioned directly from renowned scientists, the French government called on a variety of sources to make up its mind on the issue and chose the course of action. Once the controversy started, the French government wanted to learn how to put an end to the controversy, how to reconcile science and citizens, and how to regain trust and legitimacy. Open and public debates were encouraged and organized by the government itself. The citizens' conference in 1998, the Colloque de la Villette in 1998 and the États généraux de l'alimentation in 2000 are good examples.

9.2 The Scientific Community

In France, the scientific community which had an important weight from the early days of genetic engineering, continued to be highly influential as the technology started to be developed. From 1980 to 1994, French scientists were both leading and contributing to discourse. They contributed to reports commissioned by the government directly from renowned scientists and their opinion was frequently shared through the participation of the main research institutes (Institut Pasteur, INRA, CNRS…) in diverse studies and discussions. Through these activities, they opened up the discussion to socio-ethical issues. Their membership in advisory bodies (CGG, CGB, Commission d'autorisation de mise en marché) was also prevalent. Annual reports of the CGB were also commented on in the media.

Scientists also contributed to frame the discussion by individual interventions in the mass media.[35] For example, following the controversy over the first environmental release of GM bacteria in 1987, some renowned French scientists started to openly recognize that there was a real danger and that objections by ecologists were probably a good thing in forcing a discussion and in bringing about more precaution. At the time, French scientists rejected the need for a moratorium.

At the European level, influential scientists were reportedly counterbalancing ecologists during the negotiation of the 1990 directives. Without the intervention of some Nobel Prize scientists, the adopted regulation would most likely have been more

[35] Axel Kahn, as president of the CGB, intervened in the media. Axel Kahn, « Une suspicion injustifiée,» Le Monde, 27 May 1992, p. 11. Alain Deshayes, secrétaire général de la commission génétique et environnement de l'INRA about the existence of a real danger and M. Louis-Marie Houdebine about the dangers of loss in genetic variability of aquatic animals respectively in Le Monde, 24 mai 1989, p.17, and in Catherine Vincent, « Un entretien avec un directeur de recherche à l'INRA, » Le Monde, 26 juin 1991, p.13.

stringent.[36] Cöers, in Biofutur, reported that notorious scientists Jean Daussets, François Gros and François Jacob intervened directly with President Mitterand at the time of the negotiations.[37] Scientists were also important players during the negotiations conducive to the Loi de 1992. A petition was signed by a considerable number of scientists to protest against an amendment in favour of better public information and more representatives of ecologist movements within the CGB, an amendment they found would decrease France's ability to compete on the international scene.[38] Axel Khan then CGB president, publicly took a position against it[39] while the then president and director of INRA were reported to be in favour of the amendment.

After the start of the controversy, French scientists continued to take part in the debate but with increased intensity, some being frequently asked to participate in forums, debates and to give conferences on the matter. The CGB expertise was said to be too much on the side of product developers and not staffed with experts that could truly assess environmental impacts. They expressed different opinions in the press and some even came together to file petitions in favour of a moratorium in 1996 or to defend open field research in 1999. But what makes one of the main differences between the contribution of the scientific community in France and in Canada was the willingness of the French government to have conflicting scientific opinions debated publicly.

The public consultations of 1998 that included the citizen's conference, the following *Colloquium on public opinion and transgenic plants* and the series of "GMO debates" within the *États généraux de l'alimentation* in 2000 are good examples of the French government's desire to have a public debate on the issue of GMOs. This commitment of the French government towards publicly opposing scientific view points and favouring debate also translated into the CGB membership that was widened in 1993 to include experts with more environmentally relevant knowledge.

Reflection upon and discussion about the precautionary principle illustrate one of the fundamental differences between France and Canada in the state/science relation. In France, there seemed to be a greater propensity to call on external scientific advice, to publicly value this contribution, and to tackle broader political and social issues. In Canada, reflection and discussion related to the meaning and consequences of the

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[36] A. Millet and C. Vincent, "Le frisson sécuritaire: Grenoble, Maîtriser l'inquiétude," in Proceedings, Risk Management in Biotechnology. European Forum. Grenoble 24-26 avril 1989. released 1990. (also in Biofutur, juillet-août 1989.)p. 272-275.

[37] P. Cöers, "Parlement Européen: La voix des ténors," Proceedings. Risk Management in Biotechnology. European Forum (Grenoble, 24-26 April 1989), p. 276-278. Released 1990. Also referred to in Biofutur, juillet-août 1989.)

[38] The petition was called « L'appel de Heidelberg ».

[39] Axel Kahn, « Une suspicion injustifiée, » lettre, Le Monde, 27 mai 1992, p.11.

precautionary principle were internal to the public administration. Guiding principles for the interpretation and application of the precautionary principle were debated in a multi-departmental setting and were later the object of public consultations. However, these principles "reflecting Canadian practices" were to increase internal consistency and help Canada affirm its position in international discussions. Consultation documents clearly underlined the importance that these principles meet predictability, flexibility and adaptability criteria and that their application remain reasonable and cost-effective.[40]

In France, it was the difficulty to reconcile technical progress with consumers concerns and, more precisely, the controversy over GMOs that motivated Prime Minister Jospin, in 1999, to commission a report on the precautionary principle. Two high profile scientists were then asked to report on the subject - professors Viney and Kourilsky[41] - who themselves asked for the contribution of other renowned colleagues. Here is an excerpt of Prime Minister Jospin' s *lettre de mission* to professors Viney and Kourilsky: *"Vous clarifierez le sens et la portée du principe de précaution au regard de l'état actuel du droit, tant au plan interne que communautaire et international, et préciserez ses conséquences potentielles au regard du développement de la science et de ses applications, ainsi que des régimes de responsabilité."*[42]

But the French government not only asked scientists from outside of the administrative realm to contribute to the analysis of the problem, it also opened the door for the informed participation of "in-house" scientists to the general debate. In France, the emergence of the controversy brought about changes that introduced a greater autonomy of expertise and science within these structures. Not only did the Loi de 1992 introduce the obligation to have representatives of the OPECST and of environment and consumer associations sitting on these committees, but also the creation of the AFSSA brought together expertise from within government departments in a structure where scientists had a certain autonomy to conduct and commission their own research. Their reports and opinions were made into public reports which made them direct participants in the debate.

Finally, French scientists were very different actors in discourse building than Canadian scientists because of the role they have played in highly mediatised trials of the *Confédération paysanne*. These trials positioned French experts against each other and publicly exposed the extent of the scientific uncertainty. Furthermore, after the *de facto*

[40] Government of Canada, A Canadian Perspective on the Precautionary Approach/ Principle, Discussion Document and proposed Guiding Principles (Ottawa: Government of Canada, September 2001).

[41] From Collège de France and Université Paris I respectively.

[42] Lionel Jospin, "Letter to Geneviève Viney and Philippe Kourilsky," Paris, 29 Marsh 1999 in Le principe de précaution. Rapport au Premier ministre, ed. Philippe Kourilsky and Geneviève Viney (Paris: Odile Jacob, Janvier 2000).

moratorium had begun, when field research became the target of destructions, publicly funded science became the target of activists and the legitimacy of public research on GMOs was questioned. The debate which followed, amplified by highly publicized trials, focused on the orientation and goals of public research that was in this case accused of serving the needs of multinationals. Scientists had to publicly defend themselves of these accusations and fought back to preserve not only their right to conduct field experiments on GMOs but also the autonomy of science.

All the while, things were very different in Canada for the scientific community. Firstly, while, in France, contradictory debates were encouraged by the government and considered a means to resolve conflicts and reach a consensus, in Canada, open debates were simply avoided as much as possible. The dilution of the question of GMOs in the broad biotechnology debate facilitated this. Any public display of contradictory scientific opinions was circumvented by the government. Secondly, French scientists seem to have contributed to the debate more freely than Canadian scientists. In Canada, expression of views that departed from the official message was quite simply discouraged. Doubts or questions as to the safety of GMOs or the evaluation process were met with institutional barriers, communication barriers and even public discrediting of the sources.

This behaviour seems to be rooted in a history of low independent scientific contribution to biotechnology issues in Canada. Before the adoption of the NBS, the Canadian government rarely called on the rest of the scientific community outside the circle of the NBAC for advice. Studies that were done on the topic of regulation were commissioned either from private consulting firms or from concerned departments with no obligation to make them public. The NBAC, which also had the means to conduct studies, behaved the same way, something that did not contribute to any enlargement of the circle of interested parties or the introduction of new or divergent view points.[43] At the time, the Science Council of Canada (SCC), critical of the orientation taken by the government on the issue of regulation, but however supportive of the development of biotechnology in Canada, could have been an option for a more balanced point of view but it was not called on by the government to contribute. After all, the SCC created in 1966 was designated as the national consultative body for issues of scientific and technological policies. Yet, although the Science Council of Canada Act gave MOSST the power to commission studies directly from the SCC, the MOSST never did ask for direct input of the SCC on the subject. It was on its own initiative that the SCC reported on the issue in 1982, 1984 and 1985.[44] The SCC was abolished in 1993.

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[43] Evidence of this in Appendix II of the 1991 report of the NBAC.

[44] Three reports of the CSC dealt with the issue of biotechnology: Conseil des sciences du Canada, Le pouvoir de réglementer et son contrôle. Sciences, valeurs humaines et décisions Rapport 35

This philosophy, as was demonstrated above, had an echo in the institutional arrangements chosen to act as regulatory authorities. In Canada, all was done to avoid external opinions that might contradict internal expertise. Experts working on environmental or health assessments were employees of the public administration who had to observe strict secrecy rules which included restricting the access to information. Being executors of the guidelines and regulation, they had limited possibility to express personal opinions publicly and, most likely, they were well aware that failure to observe these rules could have important consequences on their careers. At the institutional level, agencies and departments in charge of assessing risks did not have the opportunity to commission studies themselves or be commissioned by the parliament or interest groups, as was the case for AFSSA. No structure was in place to allow external review of their work.

In Canada, in-house expertise was managed according to the rules of public administration. Scientists were hired to work at product evaluation within government departments. At first, scientists assessing agri-food GMOs were within Health Canada and Agriculture Canada and later within Health Canada and the Canadian Food Inspection Agency, who were the two main agencies responsible for health and environmental safety of agricultural products. This structure of expertise, combined with access to information laws that did not allow the release of any data submitted by the companies unless the company agreed to disclose information created a structure of evaluation that some called the "Black Box". Only those within knew for sure how evaluations were done on a case by case basis. Access to information rules were applied with such zeal that even parliamentary committees and scientific panels commissioned by federal ministers to study the regulatory framework were unable to have access to some of the data.[45] No outside expertise was used on a regular basis to help the decision process. Those who conducted evaluations were civil servants whose career and salary were dependent upon the evaluation of their work.

Before 1994, the press review shows that Canadian scientists, on an individual basis and with the exception of Dr. David Suzuki, were rarely reported as taking positions publicly other than to give accounts of their research during conferences or colloquia. In Canada, as the controversy grew, it became obvious that there were two categories of

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(Ottawa, Ministère de l'Approvisionnement et des services, 1982); S. Krimsky, Regulatory policies on biotechnology in Canada, rapport manuscrit (Ottawa, Conseil des sciences du Canada, 1984); Conseil des sciences du Canada, Germes d'avenir, Les biotechnologies et le secteur primaire canadien, Rapport 38, (Ottawa : Conseil des sciences du Canada, septembre 1985). A fourth one was done in collaboration with the IRPP: IRPP and SCC, eds., Biotechnology in Canada. Promises and Concerns: Proceedings of a Workshop of the IRPP and the CSC, (Ottawa: September 1980).

[45] Departments would even create obstructions to the information request that did not regard company data. See Chapter 7 on Canadian rBST and labelling controversies.

scientists that never got to debate face to face. There were, on the one side, scientists engaged in research and development, often with industry affiliation and, on the other end, a small group of scientists who would question the safety of GMOs, or regulatory aspects of their evaluation. Scientists in the latter group exposed themselves not only to strong criticism but also to being discredited.

There was however, in Canada, a small community of scientists, questioning both the safety of the technology and the methods and processes used by CFIA and Health Canada to evaluate it. This would not be very surprising except for the fact that some testified that a significant part of this latter community was hiding for fear of losing research facilities, subsidies or even career opportunities: "They will not speak in the open...they are scared of what could happen to their career."[46] Genetic Engineering Alert was a network of Canadian scientists concerned by biotechnologies who contributed to the debate under the cover of anonymity.[47] According to one of its members, open discussion within the scientific community in Canada was pretty much impossible because of all the money involved. This, according to this person, resulted in a significant group of scientists afraid to speak in the open:

> *"There is about 40 Canadians – only Canadian academics, government scientists, and people from all over. The only requirement is you need a Ph.D. or an MD and no history of industry funding. And you have to be willing to maintain absolute confidentiality because many of the people on that list are participating at considerable personal risk...[...] They might lose their jobs or they would certainly lose funding. Their opportunities for getting further research funding if they were in that area, you know. There is some very little scientific collegiality about this anymore because there is so much money involved and so much power involved."*[48]

For some, however, the reason these opposed scientists were not taken seriously was that they did not bring credible contributions, and did not have the required expertise, to participate to the debate. According to a member of the scientific community that we interviewed for this research, those who did have the expertise did not oppose it in such a way: *"...the scientists who are outside of the network/outside of the community – [...] they don't have that common experience. They don't have that ability to differentiate between*

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[46] X, Council of Canadians, interview by author, Ottawa, 25 April 2002.

[47] GE alert presented itself as "an independent group of scientists, academics, and agricultural professionals committed to informing Canadians about the implications of agricultural genetic engineering." Retrieved April 2001. www.canadians.org/ge-alert/ge-alert.html

[48] X, GE Alert, interview by author, 19 June 2002.

the rhetoric and the critical element. And so you don't have any well respected critics or proponents of biotechnology from the scientific world."[49]

The pro-biotechnology party was well prepared to contradict any opposing view. Those scientists opposing biotechnology also had to face detractors who benefited from a very well organized network of communication. Some scientists even enrolled in large public/private communication and information networks. For example, Dr. Gordon Surgeoner, previously director of plant research at the University of Guelph became chair of the Food Biotechnology Communications Network[50] where part of his work was to have a direct impact on the debate by publicly going against "misleading" information. In Dr. Surgeoner's own admittance:

> *"We are involved in issue management. Very often you will see what I call misleading information in the media. We provide, again I emphasize, science-based information in writing letters back to the editor, and those kinds of things. People will claim fish genes in tomatoes, as an example, for which there are not. So it's that kind of providing back science-based information."*[51]

In practice, such involvement in public debate sometimes took a rather "promotional" twist, echoing the message spread by CFIA's Office of Biotechnology as the following example shows: *"Ultimately, it is important for Canadians to remember that we have a food regulatory system that ranks with the best in the world and is emulated by many. Each product is assessed on a case-by-case basis, using the best available safety and risk-assessment procedures."*[52]

When the controversy increased, the government did, at one point, ask for the contribution of external expertise. It was the case when it asked the Canadian Veterinary Medical Association and the Royal College of Physicians to appoint scientific panels to evaluate the safety of rBST for human and animal health because in-house scientists could not reach a decision. The committees' conclusions were however overshadowed by presumption of conflict of interest and were believed by opponents to be a bit too much what the government needed in order get out of a difficult situation. Once again

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[49] X, Member of CBAC and scientist, interview by author, Saskatoon, 15 Marsh 2002.

[50] A public/private not-for-profit organization that had the mandate to provide science-based information about biotechnology and its impact on the agriculture and food system.

[51] Testimony by Dr. Gordon Surgeoner (Chair, Food Biotechnology Communications Network (Guelph)): in AGRIEV40_e Standing Committee on Agriculture and Agri-Food. Evidence Tuesday, May 12, 1998.

[52] Gord Surgeoner. « Genetically modified fries with that? » Comment, The Globe and Mail, 24 January 2000, sec. A, p. 13. G. Surgeoner was then President of Ontario Agri-Food Technologies.

avoiding direct confrontation, these committee experts were never put in direct contact with scientists within HC who had positioned themselves against the authorization of rBST without further studies.

The government also asked for outside scientific opinion in December 1999, as the controversy was reaching a peak in Canada. Health Canada together with CFIA and Environment Canada, asked the Royal Society of Canada to commission an Expert Panel "to provide advice to ensure the safety of new food products being developed through biotechnology".[53] But the report of the Royal Society, tabled in January 2001, apparently did not please the government and was not what the government had been expecting. It was reported that standard congratulatory notes by the three ministers who had commissioned the study were suddenly pulled from Health Canada's web site. It was followed by a "*chilly rejection of the work*".[54] As soon as the report was tabled, regulatory authorities worked to discredit its conclusions and the experts of the Royal Society. Government officials even declared that "*the experts had a poor understanding of the processes*": *"Government officials say a panel of scientific experts commissioned by Ottawa to examine the food-safety system does not know what it's talking about when it reports that the government system is flawed."* [55]

One government official was reported implying that panel experts might have consulted web pages that were not meant for expert evaluation but for lay people and that, instead, they should have asked for the relevant documents.

> *"Le comité doit avoir consulté les mauvais documents sur le site Web du ministère, a avancé Mme Dodds, selon laquelle certains d'entre eux sont destinés au grand public et non pas aux experts. Conrad Brunk, coprésident du comité, a pour sa part indiqué que ce dernier s'était penché sur tous les documents accessibles à tous, mais que certains principes clés du processus de réglementation fédérale portaient à confusion. »*[56]

Part of the pro-biotech scientific community also organized to discredit the Royal Society report. In February 2001, shortly after the release of the report, the Food Safety

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[53] The Royal Society of Canada, Elements of Precaution: Recommendations for the Regulation of Food Biotechnology in Canada, Prefatory Note, Ottawa, January 2001.

[54] Clayton Ruby, « Forget about labels, just eat what Ottawa puts in front of you. » The Globe and Mail, 13 February 2001, A17.

[55] Heather Scoffield, « Officials blast food-safety report, » The Globe and Mail, 6 February 2001, sec. A, p. 9.

[56] Dennis Bueckert, « Aliments transgéniques. Ottawa défend sa politique d'examen, » La Presse, 6 février 2001, sec. A, p. 4.

Network at the University of Guelph invited Scientific Submissions to review the Panel's Report and used its Web site to ask for comments from members of the scientific community who disagreed with it.[57] Unfortunately, an open debate never occurred since the Royal Society Panel had been disbanded shortly after the report had been tabled.

When the report was made public, there was no information that it would indeed be used to improve regulation and transparency since such an announcement would have given it credibility. Never did the government suggest that the findings of the RSC could be used to reflect on ways to improve the evaluation mechanism. Simple rejection of the work and complete denial of any problem was the line of communication of the government.

It was only in November 2001, that the government released an Action Plan intended as a response to the Royal Society Report. But there are reasons to think that the government was in fact responding to a CBAC interim report on the regulation of GMOs published in August 2001 (see Chapter 6). This Action plan was a long term project that ended with the publication of the last of eight progress reports in June 2005 and did not challenge much the organisational culture within the government. Most transparency and consultation projects were still underway in 2005.

9.3 Agri-Food Industries and Life-Science Corporations

In the 1980s, in both France and Canada, industrial firms joined together with the government to organise a strategy for the development of a biotechnology industry. In both countries, corporations were central players in a strategy that relied a lot on their participation. In Canada, however, corporations seem to have been more tightly and exclusively linked to policy development than their French counterparts.

In France and Europe, the industry sector became organized early, with the creation, in 1984, of ORGANIBIO by 3 professional associations: ANIA (*Association Nationale des Industries Agroalimentaires*), LEEM ((Ex. Syndicat National de l'Industrie Pharmaceutique) *Entreprises du Médicament*) and UIC (*Union des Industries Chimiques*). ADEBIO (*Association pour le Développement de la Bio-Industrie*), the scientific branch of ORGANOBIO, was created the same year. [58] Composed of scientists' societies,

[57] Food Safety Network. Royal Society Comments. http://131.104.232.6:3500/gmo/royalsoc.htm retrieved January 2002.

[58] Composé de sociétés savantes telles que la société française de microbiologie, des représentants de ministères concernés (Industrie, Recherche, Agriculture et Éducation). Ces missions sont ainsi décrites

representatives from ministries of Education, Industry, Research, and Agriculture, ADEBIO was devoted to the promotion of biotechnology applications in France; and had a mandate to support European and international relations. This association had many commonalities with the Canadian Institute of Biotechnology which became BIOTECanada, "Canada's voice for biotechnology"[59], in 1998. Recognized by the Loi *de 1901 sur les associations*, ORGANOBIO dealt with problems that French bio-corporations had in common. The Biosecureg Commission was created the same year to deal specifically with regulatory issues.

In 2005, ORGANIBIO was composed of 4 different commiittees: « Biosecureg », « Propriété intellectuelle », « Programmes scientifiques », « PME/PMI ». With these organisations, ORGANIBIO was asked to participate actively in governmental and parliamentary studies and in the elaboration of guidelines in collaboration with AFNOR, the Agence française de normalisation. Before the start of the controversy, it was also said to be a renowned interlocutor at both the national and the international level. ORGANIBIO was also an active member of Europabio that it contributed to create.[60] The scientific branch of ORGANIBIO, ADEBIO was asked to collaborate in many studies, including to a report on applications of biotechnologies to the chemical industry (Commissariat général au Plan. 1985). As the European directives were about to be finalized, it pressured Europe not to adopt regulations that would likely enlarge the gap between member states and other countries already ahead in the race, such as the US and Japan.[61]

Through their participation on the Task Force on Biotechnology, and later on the National Biotechnology Advisory Committee (NBAC), corporations in Canada were an important player in the elaboration and implementation of the National Biotechnology Strategy (NBS) of 1983. After all, Canada's Biotechnology Strategy, whose goal was to "encourage concerted actions necessary to make commercial progress", would rely heavily for its realisation on industry's participation in networks, centres of excellence and on public-private cost-shared programs. Its active participation was encouraged and promoted since the beginning by the Task Force which recommended that "industrial representation should be a major element" in the composition of an eventual coordinating panel. Its wishes were fulfilled. Although no formal rules were established concerning the composition of the NBAC, corporations have occupied an important place within this

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dans son site WEB : « Promouvoir les biotechnologies et leurs applications en France, et soutenir les relations avec l'Europe et l'international. » http://www.adebiotech.org/fr/index.htm Retrieved November 2005.

[59] http://www.biotec.ca/EN/about_committees.html retrieved March 2001

[60] http://www.organibio.org/common/default.ASP Retrieved November 2005.

[61] Catherine Vincent, « L'Europe des gènes verts, » Le Monde, 11 avril 1990, p.16.

committee through the years. In its 1991 report, the NBAC reaffirmed the importance, in its view, of a strong voice for the industry: *"The NBAC urges industries with interests in the commercial exploitation of biotechnology-based products and services, to join together, in developing a strong advocacy position for the resolution of national issues. A forceful voice for the industry would have a positive influence on the commercial application of biotechnology in Canada."*[62]

Furthermore, through all these efforts to adjust and clarify the regulatory framework, there was a very clear concern on the part of the government to help out biotechnology corporations through the maze of legislation. In 1988, the Food Production and Inspection Branch of Agriculture and Agri-Food Canada published a « Guide to the Regulation of Agricultural Products of Biotechnology. » Its release was followed by a workshop "to air the the [sic] regulatory concerns of Canada's biotechnology industries and to allow the Regulatory Branch of Agriculture Canada to outline its policies…"[63] The same year, the ICB subgroup on safety and regulations produced another guiding document "Biotech Regulations: Users' Guide" "to assist industry in coping with the maze of regulations."[64]

In 1993, the six principles of the Canadian biotechnology regulatory framework closely met the recommendations of the 1991 NBAC report and were the fruit of the work of the Biotechnology Committee of the Interministerial Committee on Biotechnology (ICB) which was advised by the NBAC. The principles were designed to ensure that "the practical benefits of biotechnological products and processes were balanced against the need to protect the environment, human health and safety".[65] They served both as guidance and justification for regulatory actions that were later taken, rejected or ignored.[66]

With the emergence of controversy over these technologies, corporations in Canada and in France came to have very different levels of influence in the debate. In Canada, corporations never lost the support of the government with whom they worked in close partnership to favour the development of the sector. Corporations were natural

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[62] NBAC, National Biotechnology Business Strategy, The essential ingredients for commercial success (Ottawa: The Biotechnology Secretariat, 1991). Electronic version. http://strategis.ic.gc.ca/SSG/bo01310e.html

[63] NBAC, The Regulation of Biotechnology, (Ottawa: Canadian Biotechnology Secretariat, 1988), 10.

[64] NBAC, The Regulation of Biotechnology, P.12

[65] Agriculture and Agri-Food Canada. "Regulatory Impact Analysis Statement." Canada Gazette Part II, Vol. 129, No. 2, 1995, p.210 and Canada Gazette Part II, Vol. 131, No.1, 1997, p. 22.

[66] These orientations were greatly influenced by the regulatory context set by the 1986 *Guiding Principles of Federal Regulatory Policy* which greatly favoured industries.

allies in a biotechnology strategy almost exclusively focused on research and development. Together they proactively elaborated ways to avoid barriers to market introduction. Most importantly, in Canada, all sectors of the industry joined together with the government to deliver a coherent message that downplayed risks and emphasized benefits. Corporations of the biotechnology sector in Canada have consistently had an enviable level of influence, working in close partnership with the government in every step of decision making and in contributing to information and communication strategies. It is this great cohesion of the sector and close communion with the government that have served to efficiently counter attempts by opponents to block the entry of GMOs in Canada.

In the late 1980s, the Canadian government was warned that consumer acceptance could become an obstacle to market introduction of GMOs in Canada and around the world. The industry was well aware of the challenges this kind of worry could represent. But it could count on close collaboration with the government to elaborate and implement a communication strategy, a task which the government was ready to assume leadership as this excerpt from the Canadian Grain Council Newsletter illustrates:

> *"The Biotechnology Strategies and Coordination Office of Agriculture and Agri-Food Canada hosted an industry and stakeholder consultation meeting in Aylmer, Quebec on March 19. The purpose of the meeting was to develop a coordinated approach to public and consumer information initiatives to coincide with the increasing appearance of food biotechnology products on the market."*[67]

And as these excerpts show, the Canadian government clearly felt that public information and communication were part of its mission. Members of the cabinet made it clear:

> *« However, when it comes to biotechnology, I am aware that consumers want, and need, more information. They have questions about its use in foods. This is why I have said we – as government officials, the biotech industry, growers and processors – must be more effective in communicating to the public. The challenge we face is to increase the public's knowledge about plant biotechnology and how it is regulated."*[68]

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[67] Canada Grain Council, Monthly Newsletter, March 1997.

[68] Lyle Vanclief, Notes for an address by the Honourable Lyle Vanclief, minister of Agriculture to the BIOTECanada luncheron series "Windows on the world" Ottawa, Ontario, November 6, 1998. http://aceis.agr.ca/cb/seeches/s981106e.html Retrieved may 2001.

> *"I think that in the years ahead, earning consumer confidence in biotechnology will become one of our greatest collective challenges. Consumer trust in biotechnology must be built on a regulatory system that Canadians can count on to protect health, safety and the environment, and on having the information they need to make informed choices."*[69]

Together with the industry, the government commissioned public opinion research and took part in communications networks; as well, it welcomed the participation of the industry into the elaboration and implementation of a communication strategy. At the peak of the controversy these aspects ended up being exposed in the media:

> *"Publicly available documents on Industry Canada's Web site show that between 1994 and 1999, BIOTECanada and its predecessor, the Canadian Institute of Biotechnology, received annual grants of as much as $1,1 million under Industry Canada's Technology Outreach Program. Industry Canada provides funding to many different business groups. What's different here is that part of the public money went directly to changing public perceptions of the biotechnology industry."*[70]

And it became evident that communications efforts did not focus much on risk issues. Griffiths and Barrett reported that, in 1993, Industry, Science and Technology conducted a workshop on "biotechnology and public awareness" where the Head of the Biotechnology Strategy Office of AFFC described a communication strategy that focused on promoting biotechnology with no intention to tackle risk communication.[71] Later, communications of CFIA's Office of Biotechnology were also accused of pro-biotech propaganda (see chapter 6).

Corporations in Canada also benefited from strong structural advantages. They had the opportunity to multiply their presence through corporate representation, official lobbying organisations, and, what is more, through not-for-profit organizations, private

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[69] John Manley, Minister of Industry, Speaking notes to Ottawa life Science Council National Conference and Exhibition, Ottawa, November 17, 1998.

[70] Mark Abley, "Biotech lobby got millions from Ottawa," The Gazette. Monday February 28, 2000.

[71] AAFC, Workshop on Food Biotechnology: An Information Session to Increase Awareness of Food Biotechnology within Agriculture Canada (Ottawa: Agri-Food Safety and Strategies Division, 1993), 3. Quoted in Griffiths and Barrett, "Gene Escape," Mad Cows and Mothers Milk, , ed. Douglass Powell and William Leiss (Montreal: McGill University Press, 1997), 164.

research institutions and even academics with strong interests in biotechnology development. For example, in the plant science sector, corporations were represented by CropLife Canada, "the trade association representing manufacturers, developers and distributors of plant science innovations, pest control products and plant biotechnology."[72] Not-for-profit organizations very active on the topic such as the National Institute on Nutrition (NIN) or the Consumer Council of Canada were also sponsored by corporations. The industry sector was also well represented in the Food Biotechnology Communication Network which it supported financially in partnership with the government. Finally, BIOTECanada brought together corporations, federal and provincial research councils, provincial biotechnology development agencies, some major cities, universities, and even Industry Canada under a structure of promotion and lobbying for biotechnology in Canada. Because of their inclusion within a diversity of opinion groups, corporations were in fact a lot more active and involved in policy making and consultations than it might first appear. Kuyek made a similar observation: "The biotech industry has also helped establish a number of hybrid lobby groups at the fringes and outside of government. These groups tend to be a mix of representatives from industry, government, academe and the public, and they are often funded both by industry and government."[73]

Without close scrutiny of NGOs' and experts' industry affiliations, one could be under the impression that wide-ranging consultations in Canada had indeed reached a balance of participation between NGOs, corporations and the academic community. This research has shown that industry participation was, in fact, overwhelming in some major biotechnology-related consultations: for example, the consultations conducive to the renewal of the biotechnology strategy, the consultations that led to the Canadian position on labelling that was defended at CODEX and the consultation that led to elaboration of voluntary labelling standards.

In Canada, it is also essential to underline the great cohesion of all industrial sectors concerned by agri-food GMOs. Agro-chemical - or life science – corporations were on the same wave length as grocery distributors and food manufacturers. In France, Carrefour, the largest food distributor announced that it would not tolerate GMOs in any of its home brand products. In contrast, major grocery distributors in Canada did the opposite and blocked all attempts at voluntary negative labelling by threatening to refuse access to their shelves to any product advertised as GMO free before the voluntary standards were ready. Claiming their decision was based on a concern for the truthfulness of labelling, this strategy provided some more time for corporations to have GMOs accepted by consumers (see chapter 7).

[72] www.croplife.ca

[73] Devlin Kuyek, The Real Board of Directors (Sorrento: The Ram's Horn, 2002), p.75.

Canadian corporations and the government could even count, at times, on the support of the Canadian Consumer Association (CAC). The CAC, with its position against mandatory labelling lent some credibility and legitimacy to the consultation process whose balance of participation was often accused of being flawed in favour of corporations. Its participation in the Food Biotechnology Communication Network contributed to discharge the government from some accusations of being in a too close partnership with the industry. While no other consumer association in Canada would agree to participate, CAC would.[74]

In France, agro-chemical/life science corporations that created GMOs could not even count on such cohesion. When the controversy started, manufacturers and food distributors were quick to distance themselves. Furthermore, although industries had privileged access to the government in the early stages of biotechnology development they had to start sharing this access with a good number of groups mostly opposed to GMOs when the debate started in 1996. As it became politically risky to associate with them, they eventually lost the ear of the government who agreed to increasingly stringent measures to control GMOs. From that point in time, they could not count, like their Canadian counterparts did, on public support from members of the government and much less on any government help to carry their message through.

> *"À chaque fois qu'on émerge un petit peu, on nous en met une couche. Et la dernière couche a été celle du ministre de l'Environnement, Monsieur Cochet, qui a indiqué, lors du dernier conseil des ministres de l'Environnement, qu'une fois qu'on aurait réglé le dossier de l'étiquetage et de la traçabilité, ce qui ne se fera pas avant les 18 mois environ, il faudra se préoccuper aussi de la responsabilité environnementale sur les OGM. Donc à chaque fois qu'on passe une haie, on nous en met une autre derrière. »*[75]

Although well organised and ready to contribute, corporations and industry associations in France saw their influence on policy-making decrease decline dramatically with the raise of the controversy in 1996. While other groups greatly increased their influence, agri-chemical and seed corporations in France progressively lost the ear of the government as genetic engineering and GMOs started to be treated as a socio-ethical and economical issue. Also, as the media increasingly paid attention to the issue, and as GMOs became tightly linked to globalisation, it simply became uncomfortable for the government to defend biotechnology in the open. Ministries that were traditionally in

[74] It is important to note that provincial chapters of CAC did not agree with the positions taken by the national chapter.

[75] X, Plate-forme GNIS-UIPP, interview by author, Paris 21 Novembre 2001

favour of biotechnology became mute on the subject and the government positioned itself more and more on the side of precaution, asking for labelling and traceability measures before going on with new authorizations. The biotechnology industry in France became somewhat estranged from power.

> *« Disons qu'à l'époque, nous étions presque les seuls à rencontrer les ministères. […]… et maintenant, comme c'est un débat qui a complètement dépassé le cadre scientifique, quand il s'agit de parler de seuil de présence fortuite, nous on est peut-être équipés mais on n'est pas vraiment entendus. Mais on nous reçoit quand même mais vous avez les consommateurs, vous avez les distributeurs agro-alimentaire, vous avez l'industrie agro-alimentaire, vous avez tous les acteurs du secteur plus ou moins concernés, vous avez même les organisations antimondialisations qui sont quand même très importantes en France et les syndicats agricoles. Donc, auparavant, il y avait deux ou trois organisations professionnelles qui se manifestaient sur le dossier et maintenant c'est tout le banc et l'arrière banc des associations françaises qui sur ce point-là viennent, sont reçus et on leur mot à dire. On ne mène plus, on ne mène pas du tout la barque. C'est vrai que le contexte médiatique fait que dans le contexte actuel il est difficile pour les gouvernements, je dirais même que si nous avions actuellement un gouvernement de droite, ça ne changerait pas grand chose. La pression est tellement importante que, à quelques mois d'élections majeures, il n'y a pas beaucoup d'hommes politiques assez courageux pour se positionner sur ce dossier. »*[76]

According to industry representatives, decision-makers were also greatly motivated by the fear to be found liable: *« Mais là, on est tous à peu près dans le même bateau. Les politiques, les fonctionnaires que nous rencontrons sont comme nous, peut-être mais pire que nous, ils ont tous peur […] de leur responsabilité personnelle. Le personnel politique français, […], y compris les hauts fonctionnaires et les fonctionnaires qui les entourent, ont été traumatisés par l'affaire du sang contaminé. […] Il y a eu ensuite l'affaire de la vache folle. »*[77]

After the controversy started to intensify, corporations tried to have a direct influence on public opinion. But contrary to Canada, where they could count on a certain measure of support in governmental communications, in France, life science corporations were on their own and had a hard time getting their message through: "Les seules expériences de communication directe des sociétés vers le grand public ont été des

[76] X, Plate-forme UIPP-GNIS, interview by author, Paris, 21 November 2001.
[77] X, FNSEA, interview by author, Paris, 29 November 2001.

catastrophes."[78] In addition to the government keeping a very neutral tone in its administrative communications, the government increased the credibility of opponents' claims by declaring itself in favour of precaution, of mandatory labelling, and of traceability. When the issue became linked with globalisation and national identity, there was nothing much industry could do to regain its influence: « Le débat a complètement changé et on a l'impression nous en tant qu'industriels que l'on prend le dossier des OGM en otage, que l'on s'en sert comme un symbole pour lutter contre la mondialisation, pour lutter contre les multinationales, surtout si ce sont des multinationales américaines. »[79]

The public clearly mistrusted biotechnology firms, especially if multinationals were concerned. Attempts by certain companies to reach the population during the citizens' conference were met with accusations of indirect lobbying. Attempts to win public acceptance were met with anger and scepticism so that at one point, corporations simply decided to keep a low profile and concentrated their efforts in keeping the government and the parliament informed. A representative of ANIA that we met for this study confided that, past a certain point, there was no use trying to influence public opinion, all there was left to do was waiting. Corporations in France had simply lost the battle for public opinion.

> *« Et au contraire, plus vous expliquez, plus vous irritez et plus ça monte. Donc en fait pour les OGM on est là. Donc (…) explication ou pas explication, il n'y a plus rien à faire. Il faut attendre que ça se calme, que les gens se lassent,… » «… c'est que sur ce genre de risque, quand vous êtes passé au-dessus du niveau de crise vous n'êtes plus crédible, il n'y a plus rien à faire. »*[80]

So all the industry could do was to wait for the wind to turn. The press review showed that most corporations in France, along with supporting biotechnologies, indeed chose to keep a low profile during the peak of the controversy. In 2001, the wind started to turn somewhat when protesters destroyed field tests of GM corn grown for research on a molecule involved in the treatment of Cystic Fibrosis. But, in the short run, it was not enough to allow corporations to regain significant influence in the discourse.

If the agri-chemical industry gave up on the idea to have an impact on public opinion, they kept working to influence the government and the parliament. In 1997, together they published *Les plantes génétiquement modifies. Une clef pour l'avenir.*

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[78] X, Plate-forme UIPP-GNIS, interview by author, Paris, 21 November 2001.
[79] X, Plate-forme UIPP-GNIS, interview by author, Paris, 21 November 2001.
[80] X, ANIA, Interview by author, Paris, 6 December 2001.

defending the case that genetically engineered plants could present advantages for consumers and the environment.[81] They later produced educational booklets to inform and teach about plant selection and plant biotechnologies.[82] They also published newsletters explaining the necessity of field research, where they gave an overview of the French regulations for field research. They also explained the regulatory framework for environmental assessment of GM plants in France and even offered a discussion of economical and trade impacts of rejecting GMOs.[83] In Canada, corporations received a lot of help from the government to forward similar messages, but in France, need we repeat it, life science corporations were on their own.

Contrary to Canada where grocery distributors, food producers and the agro-chemical industry banded together and could even count on the support of the well-known but contested Consumer Association of Canada, the French agri-food industry was not able to show a united front. If, in other European countries such as UK or Germany, actors from the agri-food industry had united to create the Food Biotech Communication Initiative (FBCI), it never worked in France.

Soon after the first GMOs were granted permission to be sold in France major grocery distributor Carrefour created a domino effect when it announced its intention to ban the use of GMOs in home brand products. "Avec les grandes distributions, les grandes et moyennes surfaces, là clairement la ligne a été donnée par Carrefour qui a refusé tous des OGM dans ces produits. Ce qui a entraîné un effet de domino et une partie des acteurs de la filière à refuser les OGM et à se fournir en Soya non-OGM en production bovine entre autres. »[84] But for Carrefour, that was still suffering from the BSE crisis, this decision was said to be in line with the application of the precautionary principle and consumers right to choose:

> *"Le peu de recul sur les risques potentiels, tant pour la santé que pour l'environnement, nous a imposé le principe de précaution. Pour Carrefour, ce principe doit s'appliquer lorsque, en l'absence de certitudes scientifiques, un*

[81] Confédération française des semenciers (CFS) – Groupement national Interprofessionel des Semences et plants (GNIS) –Union des Industries de la Protection des Plantes (UIPP), *Les Plantes Génétiquement Modifiées. Une Clef pour L'avenir*. Livre blanc. (St-Denis –la –Plaine : CFS – GNIS – UIPP, octobre 1997).

[82] CFS - GNIS – UIPP, Les Plantes transgéniques, leaflets, 1999; Groupement National interprofessionnel des semences et plants (GNIS), Les biotechnologies de nouveaux horizons pour l'amélioration des plantes, (Paris : GNIS, 2000). CFS, GNIS et UIPP, Les OGM en 10 questions.

[83] Les professionnels des semences et de la protection des plantes, CFS – GNIS – UIPP, Lettre d'information sur les Plantes transgéniques. Lettre d'information aux décideurs publics et relais d'information. No. 1, 2, 3 et 4, janvier, juin, septembre et octobre 2001.

[84] X, Plate-forme UIPP-GNIS, interview by author, Paris, 21 November 2001.

> *changement est irréversible et incontrôlable. Convaincus que le consommateur doit pouvoir choisir librement entre des produits avec ou sans OGM, nous avons pris dès 1996 la décision de tout mettre en œuvre pour proposer à nos clients une alternative crédible avec des produits à marque Carrefour « non-OGM ». »*[85]

As a consequence of Carrefour's decision, the food processing industrie represented by ANIA distanced itself from the agro-chemical industries for it could not afford to be associated with them.[86] Before long, some major food producers announced that, because of consumer fears, they would modify their recipes to exclude the use of GMOs from their products sold in Europe. In so doing, they indirectly sent a message that confirmed the existence of risks. Finally, after Greenpeace had published its black list, most food producers started to remove any ingredient that could contain GMOs from their recipes:

> *« Très rapidement les industriels ont pris des dispositions pour éliminer complètement la présence d'OGM …enfin pas à l'intérieur du seuil de 1%. Donc du coup on s'est retrouvé… je dirais que le facteur qui nous a permis de mesurer l'évolution, c'est que début 1997 ou 98, la liste noire de Greenpeace qui était sur le site Internet de Greenpeace faisait trois pages, et qu'aujourd'hui elle est vide. »87*

In France, at one point, it had become politically risky to declare oneself in favour of GMOs. Because of this, traditional farmer organizations simply chose to keep a low profile. Representatives of Association Générale des producteurs de blé (AGPB), of Association générale des producteurs de maïs (AGPM) and of Fédération Nationale des Syndicat d'Exploitants Agricoles (FNSEA) that we met for this research all confirmed that they felt taking position would lead to trouble because of consumer fears but also because they too had to face internal dissention:[88] « *On a essayé autant que possible de ne pas prendre position par rapport aux OGM parce que c'est clair que vis-à-vis de*

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[85] Chantal Jaquet, Directrice Prévention, Santé, Sécurité, Environnement, éditorial, OGM, 5 ans d'engagement Carrefour, 2001. www.carrefour.com (accessed 06/2003)

[86] X, Plate-forme UIPP-GNIS, Interview by author, Paris, 21 November 2001.

[87] X, ANIA, Interview by author, Paris, 6 December 2001.

[88] In Canada, except for organic farmers, main farmer associations went public when they felt that certain GMOs could have negative economical impacts. Such was the case of rBST or GM wheat they thought could lead to significant market loss.

l'opinion publique, tous les gens en France qui se sont déclarés pour les OGM ont eu des problèmes. »[89]

In sum, while corporations in France were on their own and had to limit their information and communication activities to the government and the parliament, Canadian corporations had a lot more opportunities to have an impact on public discourse. With great cohesion and their representation being multiplied because of private research institutes and industry-linked not for profit organisations, corporations in Canada secured themselves a very good place in any consultations or consultative committees. But corporations also had the strategic opportunity to welcome the government as a partner in development of a communication and information strategy for biotechnologies. Through this close partnership with the government, corporations had a significant impact on discourse building and on the management of the public controversy, giving opponents little opportunity to shine.

9.4 Opponents

In both France and Canada, opposition to biotechnologies was slow to emerge and only became significant in discourse with the market introduction of the first GMOs. If, in both countries, opponents' actions started at about the same time, they were not equally successful. In France, the deficit of trust left by previous safety issues and underlying pervasive anti-American sentiment allowed opponents' logic of antagonism to flourish. With an approach that emphasised scientific uncertainty, the lack of state capacity, the vulnerability of French culture while underlining social risks, opponents successfully fashioned a discourse around a spectre, an antagonistic force well worth fighting against and that would gather together opposing forces to globalisation. With the decisive participation of the Confédération paysanne and its iconic representative, José Bové, opponents were soon in a position to dominate the debate.

In Canada, opponents had a much harder time wining over public opinion and attracting media coverage to their cause and ideas. Strong cohesion between the government, the industry and an important part of the scientific community created an impressive barrier that brought some of them to either disengage from the debate or to adopt an activist stance. But the main difference in the degree of influence attained by opponents in France and Canada was perhaps linked to the type of risks that each introduced in their respective discourses. In Canada, opponents did try to bring risks to

[89] X, AGPB, interview by author, Paris, 27 November 2001.

the forefront and questioned the ways and intentions of the government but they did not, as French opponents did, transform the issue into a question of collective identity and did not tie it to the battle against globalisation.

In France, environment and consumer defence groups, as well as the farm sector, were not included in the initial discussion about genetic engineering techniques. It was not until the 1990s that they got involved but only in a modest way, with a small representation in the making of studies by the OPECST and later by their inclusion on the CGB due to the 1992 changes to its composition. French consumer associations and French ecologists were not at all vocal on the question at the time. As a 1987 interview with Brice Lalonde, former president of Friends of the Earth – France, illustrates, the French ecologist movement so far considered biotechnologies rather favourably.[90] In fact, there was no evidence of contestation from the French ecologists in Le Monde from 1986 to 1993 (see Press review) and French ecologists even had to be convinced to support an amendment to the Loi de 1992 in favour of better public information and more representatives of ecologists within the CGG and CGB.

The opposition to biotechnology came at first from the European level; with the first field trials of GM bacteria in France, Germany, and UK (see section 4.2 for more detail). The German and the Danish Green Party and the Coalition Arc-en-Ciel, created in 1987 by the adhesion of 300 personalities from diverse European countries, were at the heart of this movement.[91] But the French Green party was said to be, at the time, more nuanced and did not want to depict biotechnology as a catastrophe.[92]

In Canada, the complexity of the legislative framework, the "legislative maize", contributed to keep uninformed players out during the early days of biotechnology. It comes as no surprise that the first environmental defence groups to get involved on the issue were mostly those specialized in the analysis of law and regulations. The Canadian Environmental Law foundation, the Canadian Institute for Environmental Law and Policy (CIELAP) and Alberta's Environmental Law Centre contributed to the early reflection on CEPA's ability to regulate biotechnology products at a time when French ecologist movements did not pay much attention to the issue. The nature of these organisations,

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[90] Sylvia Vaisman, "Les écologistes face aux biotechnologies: plus associés que contestataires. Un entretien avec Brice Lalonde," Biofutur, Décembre 1987.

[91] Created in 1987 by the adhesion of 300 personalities from diverse European countries, the Réseau Arc-en-Ciel claimed to be inspired by the alternative left and its objective was to lay the foundations of a new coalition outside of the traditional structures of the left. « Le réseau « Arc-en-ciel,» Le Monde, 14 février 1987, p.30.

[92] Daniel Chevalier, Les applications des biotechnologies à l'agriculture et à l'industrie agr-alimentaire," (Paris: Economica, 1991), 62.

known for their ability to analyse policies and laws, not for their propensity towards activism, also contributed to the little public exposure to the issue.

It is at the stage of the implementation of the biotechnology framework that consultations opened to a wider range of interests, with the necessity to ask for comments on regulatory and on formal guidelines proposals. But this form of public consultation came late in the process, after broad policy and regulatory directions had been defined. This choice, by the federal government, to keep the debate in closed circles and to open up the discussion on more technical issues only contributed to keep the emerging debate at a technical level and eliminated the possibility of having a debate at the level of more ethical, philosophical, and sociological issues. Broad orientations had already been defined through the NBS and the regulatory framework. According to Leiss, "the chosen regulatory framework was constructed in a secret dialogue between industry and government officials; the public was invited in, and introduced to the subject, only after the fact, after governments was committed to its basic structure."[93] This late involvement of consumer and environment defence groups put them at a disadvantage in comparison with corporations that got involved in the very beginning, benefited from an enviable representation in the NBAC and were the target of information sessions on the part of Agriculture Canada and Industry Canada.

The call for comments on Health Canada's 1992 proposal for regulation on Novel Foods illustrates this point. Welsh reported that the initiative received 62 comments, "primarily from individual companies and industry associations dealing with food processing and the agricultural industry". Few comments came from environmental groups and private citizens.[94] Given the very evocative name of the consultation document *(Information Letter No.806)*, the very technical and scientific nature of the question, and given the fact that "novel food" included biotechnology (and genetic engineering) without naming it, it is understandable that most comments came from those who were already the most acquainted with the subject: corporations and experts with a vested interest in the development of this technology. This process *de facto* created a barrier to new and less informed players.

In fact, before the early 1990s, and with the exception of RAFI which had been vocal on the international scene since the early 1980s, environmental and consumer defence groups in Canada were not very active on and very aware of the subject. Unfortunatly, groups specialized in the analysis of law and regulations concentrated their

[93] William Leiss, "Frankenfoods; or, the Trouble with Science." In Understanding Risk Controversies, ed.William Leiss (Montreal: McGill-Queens University Press, 2001), 22.

[94] Frank Welsh, "Food Biotechnology Regulation – Canadian Approach" in Workshop on Food Biotechnology (Ottawa: Agri-food Safety and Strategies Division, 29 March 1993), 100-101.

effort on CEPA with very little results in the end. According to Isaacs, "Canadian environmental groups have been relatively slow at getting involved in the biotechnology issue compared to groups in some other countries particularly those in Europe." He suggested however that this should not be taken as a lack of interest but as a lack of expertise and definitely as a lack of resources.[95]

A good example of this information gap is the late involvement of environmental groups on the issue of field trials of GMOs, four years after the first field tests began. In August 1991, the Globe and Mail reported that, using "leaked government documents, access to information act inquiries and discussions with federal officials", Paul Muldon of Toronto-based Pollution Probe expressed "fears that altered genetic material from the field trials could escape and contaminate the environment" He asked the "government to stop the field testing pending the development of legislation on genetic engineering" and "asked for the creation of an independent review board." He was also reported saying that "[i]t is reckless to bring this work out of the laboratory and into the natural environment before adequate laws to govern genetic engineering have been adopted." [96] To this, a University of Guelph scientist, Wally Beversdorf, replied that the Elora field test in Ontario had been announced two years before. He added that "They (environmentalists) haven't done their homework," and that University of Guelph officials had made the information clear in May, 1989.[97]

Groups opposing GMOs in Canada continued to have difficulties even after the first GM products were authorized for sale. The dimension of the country, the diversity of regional interests and language barriers played against unification of their forces and imposed important costs on their operations. Environmental defence groups in general had a hard time getting their message through. The very coherent and monolithic message from the government/industry collaboration was difficult to attack. Denying problems and dodging questions, they would not let opponents have a hold on discourse. In fact, many identified the government itself as the main adversary to their vision due to its tight links with corporations:

> *"Our biggest opponent is the government because faced with the facts – I mean something like a [report of the] Royal Society of Canada [with] over 53*

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[95] Colin Isaacs, "Food biotechnology – Special Interest Groups Perspective," Processing of a Workshop on biotechnology (Ottawa, 29 march 1993), 125.

[96] Martin Mittelstaedt, "Controversial plant tests approved, Critics say genetic engineering experiments lack safeguards," The Globe and Mail, Friday August 30, 1991 sec. A, p. 1-2.

[97] Mittelstaedt, "Controversial plant tests approved..." Another article was published two days before in the Winnipeg Free Press "Secret genetic tests must be stopped: ecology group says" but the issue was totally ignored in other daily newspapers in Canada, including the French Canadian press.

recommendations and they are just completely ignoring it. Things like that, there's nothing – your hands are tied."[98]

"The opponents? It's difficult to say because government is so much, in our opinion, so intertwined with the industry that it's difficult to see where industry ends and where government begins."[99]

Groups opposing GMOs had to face important time and money expenses. For example, the participation of NGOs at different meetings (including international ones) was made through the Canadian Environmental Network who would, after consultations with its members, designate one group that would attend the meeting. That group would receive financial support from government; others who wished to be there had to pay for their expenses. Another example, participation in CBAC was voluntary, only travel and hotel were covered, meaning that only those who could afford to spare some human resources could afford to go.

"Nobody pays for networking! Nobody pays for talking to you guys!!! The government has to change its relationship with us too if they want us as a partner. And they are all going off to Johannesburg with this partnership saying we're working with partners, then treat us as a partner! We need to have equal resources…"[100]

Furthermore, through the years, these groups have learned that their efforts were pretty much useless because the government was not paying much attention to their recommendations. Some consultations were done on very technical, specialized aspects of the question, which take a lot of time and energy to prepare. Moreover, some complained that no follow ups were made on their comments. At one point, some simply decided to disengage from consultations. Their participation, it was felt, was mainly ornamental. From that point, some decided to take a more activist path.

"En général, notre approche était qu'il fallait participer et que la stratégie de la chaise vide, ça ne valait pas le coup. Dernièrement, on a remis ça en question. On a pris la décision de ne pas participer à l'initiative pour l'étiquetage volontaire. Ça nous a coûté très cher. Il y en a qui nous en ont voulu et qui nous en veulent encore de ne pas avoir participé parce qu'on était probablement les seuls qui avaient une connaissance profonde du dossier. Il y

[98] X, Council of Canadians, interview by author, Toronto, Ottawa, 25 April 2002.
[99] X, Sierra Club, interview by author, Ottawa, 25 April 2002
[100] X, CIELAP, interview by author, Toronto, 19 June 2002.

avait deux problèmes. Ça allait en l'encontre de ce en quoi ont croyait et il y avait aussi un manque de ressources. »[101]

« I guess the reason why the Council of Canadians and Greenpeace, and these groups boycotted the CBAC process was that they felt that (…), in any case, even if CBAC did come up with something useful, the government is not going to be open to it, as far as the government has already chosen a path. And I think that is true. Right now our government has chosen a path and it's starting to go down that path until we can get a significant number of Canadian people to say "no"."[102]

Eventually, groups more specialized in activism such as Greenpeace or Friends of the Earth got involved and gave the campaign against GMOs a more radical twist. The masses became the target of information campaigns, petitions were filed and more pressure was put on the parliament. This strategy nearly worked for labelling. Big grocery chains having infuriated the population when they refused any negative labelling on their shelves in the Spring of 2001, it opened the door to the possibility that the private member's bill on mandatory labelling, the "Caccia bill" would be voted on by parliament. Once more, the government got away with it by promising a further inquiry on the matter.

To make things worse for opponents, consumer defence groups were rather weak and fragmented in Canada. Here again, the language barrier made it difficult to rally together the movement or to share information. In addition, competition for funding contributed to create a bad atmosphere and further complicated any attempt to create a pan-Canadian movement. "One thing that is very clear in Canada is that the consumer movement per se is a shadow of what it is in many other countries. (…) It suffers from the double problem of being small and fragmented."[103]

On the issue of biotechnology, two of the main consumer organisations did not even show a united front. On the one side, the Fédération nationale des Associations de Consommateurs du Québec (FNACQ) was one of the first if not the first consumer association to work on the topic. Benefiting from subsidies from Industry Canada's Office of Consumers, this organisation produced research reports on the issue in 1994. It also participated in numerous consultations on labelling, regulations and rBST. It was critical of the government's approach in dealing with GMOs and positioned itself in favour of mandatory labelling. Unfortunately, reports from this organisation never

[101] X, FNACQ, interview by author, Quebec City, 16 May 2002.
[102] X, CIELAP, interview by author, Toronto, 19 June 2002.
[103] X, Industry Canada, interview by author, Ottawa, 22 February 2002.

benefited from enough money to pay for their translation and, perhaps for this reason, went largely unnoticed in English Canada. The FNACQ eventually lost its subsidies. The reason, according to a FNACQ representative we interviewed, was that the government felt they were becoming too critical of the technology.

> *"On était toujours là. Évidemment, plus t'es là et plus t'es actif et un moment donné t'es coupé. On a eu un peu d'argent après mais plus limité, pour faire des choses plus pointues. (…) Je ne veux pas être cynique mais si tu prends des positions qui vont à l'encontre, tu vas être coupé. (…) l'argent, ils la donnent à des groupes moins revendicateurs. C'est une appréciation personnelle.»* [104]

On the other side, the Consumer Association of Canada adopted a position that was very close to the government's approach. This association was however severely discredited by environmental defence groups. They accused the government and the industry of using CAC to inject some legitimacy into their consultation process and communication strategy. CAC's sympathy for a voluntary approach to labelling and close links with the industry was exposed in a CBC Marketplace story in 2001 that revealed that CAC received subsidies from CFIA to advise the agency on how consumers could react to GM foods and to partake in propaganda through an information booklet "A growing appetite for information" in partnership with the Food Biotechnology Communications Network. Also, a former CAC leading spokesperson for biotechnology had accepted to go to work for Monsanto. As this piece of interview with the Canadian Health Coalition shows, CAC had, at the time, lost all credibility among NGOs: "[CAC] is so entwined that they lost the ability to provide that independent oversight that is essential to consumer watchdog groups. Instead of being a watchdog, the CAC has become a lapdog for government and biotech industry."[105] The Council of Canadians also felt it had to discredit the CAC to make sure the industry and the government could not use their name to pretend that they were in touch with the wishes of the consumers.

> *"The Consumer's Association of Canada is a joke. They basically – they've taken money from the government specifically to do work in favour of biotech. If you are going to have a consumer's association that's going to support a voluntary labelling standard as opposed to mandatory when 95% of the population wants mandatory labelling – do I need to say more? (...) we also had*

[104] X, FNACQ, interview by author, Quebec City, 16 May 2002.

[105] Bradford Duplisea, Canadian Health Coalition, interviewed in Marketplace, CBC, March 6, 2002.

> *to go on the defensive because of the fact that the industry was relying on them in the media and in government to say: well, consumers, this is what they really want.''*[106]

In France, from the start of the controversy in the mid 1990s, opponents to GMOs constituted the most coherent and influential discourse community. Composed of consumer associations, environmental defence associations and of some alternative farmer associations such as Coordination Rurale and Confédération Paysanne, they consistently held to a discourse that emphasized the risks, pressed the government to adopt a moratorium, a more transparent scientific framework and more stringent regulations before authorizing any GMOs. It is hard to summarize the approach of such a large and diversified group of associations but, when opponents succeeded in making GMOs a case of protecting France against an American invasion, the issue became so politically explosive that it became very difficult for the government to be openly in favour those products. With the BSE crisis so fresh in peoples' mind, it was easy for opponents to draw embarrassing parallels that would leave the government and industry on the defensive. For example, with the first authorizations, Greenpeace was reported accusing the government of surrendering to the interests of the multinationals; the government was accused of having ridiculed the precautionary principle as well as democratic rules in a decision made furtively and without consultation. Even worse, they implied that the government had bent to the pressure of the United States and the multinationals. They concluded that no lessons had been learned from the mad cow disease events. [107]

This message, that the United States and multinationals were trying to impose potentially dangerous technology with the government's blessing contributed to increase the level of institutional risks experienced by already vulnerable French government and regulatory authorities. It also propelled GMOs to become a topic of national interest. Risks were starting to take the form of an imposition, from the outside, of a product that did not meet local values. Europe, it seemed, was unable to offer legal protection against this American menace. Pressures were too big. Risks were not only to health or the environment. In public discourse, not only were they beginning to be related to a possible lack of means or capacity of the authorities to take proper decisions, opponents were also suggesting that the government was in fact taking the side of multinationals against its own constituency.

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[106] X, Council of Canadians, interview by author, Ottawa, 25 April 2002.

[107] « Greenpeace dénonce le feu vert français à la culture du maïs transgénique, » Le Monde, 29 novembre 1997, p.3.

Opponents in France fought on many fronts. But first and foremost, they were very successful at using the legal system to their advantage. In mid September 1998, the press reported that the Conseil d'État was asked by Ecoropa, Greenpeace and the Confédération paysanne to examine the February 5, 1998, decree authorizing BT corn to be commercially grown in France. This event received important coverage, especially in Le Monde. In this coverage, opponents argued that procedures and rules which led to the decision to authorise Bt corn to be grown in France did not respect the precautionary principle and that environment and health risks had not been properly evaluated before this decision was taken.[108] The government's commissioner had to defend the decree, placing him and, by association, the government on the side of the promoters of GMOs. The government commissioner's opinion was reported in the media: the precautionary principle, as described in Loi Barnier, did not have a compelling judicial value.[109] Opposing the government, Greenpeace and the Confédération paysanne were pictured as being on the side of more and better environmental protection.

Later, the decision of the Conseil d'État to suspend the authorization while examining the request was described in Libération as a "slap in the face" for the government. Not only did it add to the apparent incoherence of the situation, it suggested to the public that environmental and health risks were serious enough to justify this additional precaution.[110] When the Conseil d'État decided to ask the opinion of the European Court of Justice, it simply sent the message that France perhaps did not have much power over GMO authorization. If it served to defer some of the blame to the European Commission, it also reinforced the idea that the national government lacked the capacity to act, thus increasing somewhat the level of institutional risks placed upon the government.

From a position of "not all is bad", ecologists in France soon adopted a zero tolerance discourse. They found issues with every GMO authorisation. For some groups, it even went as far as being against field testing. Destruction of GM seeds, GM crops, GM experiments, and field tests, and the resulting following judicial trials garnered media attention: groups of activists were ready to risk going to prison only to fight the introduction GMOs on the French territory. Those being ready to act despite the consequences sent a clear message to the population: risks are real and, since the

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[108] Herve Kempf, « Le Conseil d'État examine l'autorisation du maïs transgénique. Plusieurs associations demandent la suspension de la mise en vente prévue pour novembre, » Le Monde, 17 septembre 1998, p. 32.

[109] Herve Kempf et Rafaele Rivais, « La France est d'accord pour engager à nouveau le débat européen sur les OGM, » Le Monde, 21 septembre 1998.

[110] « Un camouflet au gouvernement. » in « Pas de semailles pour le maïs transgénique. » Libération, 26 septembre 1998.

government is not acting to protect us, we citizens have to take action. In doing so, they created a scenario where the government and the industry were against heroic activists defending the country against invasive globalisation and protecting French specificity. Opponents – mostly Confédération paysanne leader José Bové - were very clever in the way they turned these trials to their advantage. When they participated in destroying GM seeds, it led to the governments' policies and evaluation processes that ended up on trial in the media. When a McDonalds restaurant was "dismantled", multinationals ended up being the ones at fault. When activists started destroying field tests, it was public research, its orientations and purposes, which ended up on media trial. Most importantly, the way prominent members of the Confédération paysanne handled judicial trials that followed brought together NGOs and citizens from across France around the goal to fight a certain form of globalisation which included GMOs.

If Greenpeace succeeded in bringing the debate to the question of globalisation and fear of multinationals, it was José Bové, co-founder of the Confédération paysanne, who came to personify this fight. Even though not all GMOs were American made, he succeeded in making GMOs a case of American imperialism attempting to wash out French food specificity, a discourse that brought together this otherwise eclectic community of opponents and made it very politically difficult for government to show open support for the technology. Once this goal was achieved, all who would dare to support GMOs would be perceived as working against France.

> *« On s'aperçoit au fur et à mesure que le temps se déroule qu'en réalité, chez nous en France et je pense à l'Europe en général, que ce thème des OGM est très très lié au débat sur la mondialisation. Donc c'est en réalité des structures associatives ou des ONG ou des la société civile qui veulent combattre ou influencer les conditions actuelles de la mondialisation qui sont les plus efficaces comme contestataires dans le dossier. Donc les OGM deviennent un peu le fer de lance des réactions contre la mondialisation (…) »*[111]

In the media, José Bové was eventually portrayed as the main defender of French identity before the government. At one point, he had so much influence that the minister in charge of Agriculture and even the Prime Minister were trying to be seen with him to show their openness to the cause. Earlier hesitation of the government and attempts to defer the blame to Europe or expert structures had contributed to give an image of a government unable to manage the situation effectively. To this discourse of precaution and apparent inability to act against the American invasion, Bové and the Confédération offered a discourse of no compromise, intolerant even to field research. GMOs could

[111] X, GNIS, interview by author, Paris, 3 December 2001.

simply not be tolerated on French soil; the country had to be protected against it even if it meant going to prison.

Reported to be presented by Times Magazine as a French version of Lech Walesa, Bové was becoming a hero of international proportion and above all, in the people's mind and in media descriptions, he was symbolically replacing national authorities in the defence of French specificity against the global invasion of American products and the very powerful biotechnology industry. In Seattle, he succeeded in condensing the entire problematic of globalisation into a few key concepts. Bové's intervention at the Davos forum contributed to reinforce the perceived polarisation between ordinary people and decision-makers, exposing their lack of transparency and alleged collusion with multinationals. On the national scene, the press reported that Bové was invited to meet with President Chirac and later with Prime Minister Jospin.[112] It is hard to say who benefited more from the meetings, Bové or the politicians. In a few months, Bové had become a symbol of the French resistance and had provided common ground for collective identification with the cause. "*Robin des Bois du Larzac », « Zorro du Causse aveyronnais », « Sous-commandant Marcos de la cause rurale »* were some of the powerful images used by the media to refer to him.

9.5 Conclusion

The structure of governance says a lot about who, inside and outside the government, does have influence in decision making. From the early 1980s up to 2002, the French government showed a greater openness to socio-ethical aspects than did the Canadian government. It appears that this was both a consequence and a driving force when it came to choosing a structure for governance and a regulatory framework. France never closed itself to consider the issue in a wider perspective that welcomed the expression of a more extensive variety of opinions. Canada created a strong coordinating structure with Industry Canada in the leading role and industrial development as its core mandate. This structure rapidly became exclusive of other views and favoured the creation of strong and close partnerships between branches of science specialized in biotechnology development, the government and the industry. The structure of participation and mode of consultation were built, imagined, and tailored for these actors: a high degree of technicality and redundancy with no economic incentive to participate.

[112]« Chirac-Bové, discussion de Salon,» Libération, 28 février 2000. « Jospin-Bové - dîner et tutoiement. Souvenirs du Larzac, bilan de Seattle Opération séduction, » Libération, 18 mars 2000. « Lionel Jospin a convié José Bové à dîner, » Le Monde, 20 mars 2000.

In Canada, this partnership extended to the elaboration and implementation of a communication and information strategy that promoted biotechnologies. In France, the government was also accustomed to work with the industry but their relationship was not as exclusive. The scattering of responsibilities among departments and no strong coordination of programs and policies left the issue open to new influences.

This chapter brings to light the emergence of two very different discursive networks. In Canada, the government, all sectors of the food industry, and an important part of the scientific community came together to allow the continuous development and growth of the biotechnology sector. As a result, opponents have been easily marginalized and isolated. With few resources and little coherence within and between the different groups, opponents had a hard time getting their message through to the government and finding public support to their cause. Official consultations were made into time and energy consuming events with little chance to forward their concerns; the government was openly supporting GMOs and the parliament was powerless.

In France, life-science/agri-chemical corporations were the ones who ended up being isolated and marginalized. Opponents' credibility was boosted by the openness of the government in favour of stricter regulations. The GMO controversy arose when the BSE crisis was not even ended which had left the government and expert system vulnerable and suffering from a deficit of trust. The government's decision on an issue which was quickly associated in people's mind with the previous system failure of BSE brought high scrutiny from the press. As a result, food processors and distributors, working previously under the same banner for the development of biotechnology were quick to disassociate themselves from life science corporations producing GMOs. The press being attentive to the anti-GMO discourse, it became a public forum for expressing doubts and fears. Opponents very cleverly used every opportunity to forward their cause. Creating a link between GMOs and globalisation, they attacked the credibility and the legitimacy of the government and of international instances. Taking advantage of its fragility, they forced the government to agree to increasingly limiting regulations.

CHAPTER TEN

Conclusion

This dissertation has drawn upon a comparison of the evolution of the discourse surrounding biotechnology in France and Canada to provide significant insights into the role of risks in political change. Although it can be argued that environmental and health related risks of GMOs were similar in both countries, different political contexts and different institutional settings led the French and Canadian governments to adopt very different strategies to deal with the controversy. In so doing, these two countries provided important contrasting evidence on how social constructions of risks could favour or discourage political change. In carrying out this study, I have drawn conceptually upon scholars of risks in late modernity whose research has offered precious insights. Similarly, discourse theory provided methodological and conceptual guidance. Inspired by this literature, I elaborated an analytical framework that placed the expression of social and institutional risks at the center of this study.

This research suggests that the expression of social and institutional risks can lead to significant institutional and political changes if a reflexive process can take place around the expression of those very risks. But findings also show that governments do have some leverage when it comes to controlling the reflexive process and its outcome. Accordingly, some governments and some institutions are able to resist change more successfully than others. These different levels of institutional resilience also point to the importance of democratic institutions in limiting the type and range of strategies that a government can use to control discourse and manage institutional risks.

When it comes to GMOs, France and Canada were both exposed to the expression of social risks, but these risks were different in nature and in intensity. In France, the government itself participated in the discourse about social risks of the technology. The special nature of GMOs was recognized early on with the creation of the CGB, with the European directives of 1990 and later with the Loi de 1992. In France, GMOs became an issue in their own right and did not, by association, benefit from high public support in favour of medical applications using biotechnology. Risks that GMOs could present for human health or the environment were recognized in governmental communications. Furthermore, adding to the credibility of opponents' claims and thanks to previous food safety issues, the government was quick to position itself in favour of a precautionary approach to regulation. This approach was to be accompanied by measures to increase

transparency of the decision-making process and to provide better consumer information through labelling. Opponents to the approval of GMOs both in agricultural production and in novel foods benefited early from important and favourable press coverage about potential risks of the technology. GMOs became linked to the issue of globalisation and fears of American imperialism on the one side and were viewed in the context of earlier government failures in the mad cow disease episode on the other. Accordingly, being in favour of these products of genetic engineering became synonymous with being in favour of a certain loss of cultural identity and with existing expert systems. Around and within this idea of loss of identity and this suspicion of government's capacity to deal with scientific matters collided all other risks related to GMOs. Opposing forces could crystallize around these factors. Risks were eventually condensed into something identifiable, understandable and worth fighting against: a "spectre"[1].

Indeed, this study shows that, when GMOs started to be presented as a symbol of the pernicious aspects of globalisation and of the imposition of products that were culturally threatening to the French way of life, antagonistic forces were created against which opponents all around France - and even beyond - could unite. Acts of civil disobedience contributed to reinforce the perception that GMOs represented important threats. It also created a situation against which the pro-biotechnology, pro-GMO forces did not have much leverage. To be in favour of GMOs eventually became synonymous with a failure to protect the French cultural specificity, an almost anti-patriotic act. With GMOs being increasingly presented as part of a globalisation and acculturation spectre well worth fighting against, the pro-biotechnology voices in France became almost mute because they feared any attempt at influencing public opinion would have the opposite effect and worsen views of the technology even further.

In Canada, the government limited as much as possible the expression of potential health and environmental risks of plant biotechnology. All through the duration of the controversy, its communication strategy was to downplay risks as much as possible and to insist on the benefits that biotechnologies would bring to all Canadians and to the industrial sector. Biotechnologies in general - including GMOs - were presented as a solution to increase well-being and as a means to address environmental problems. When the government opened up the dialogue, it made sure to include all biotechnologies so that the agricultural applications would benefit from the positive impact of biotechnologies in medical innovations. The only risk that was put forward by the government was the one of losing important economic opportunities and of failing to reap the benefits of long-term investments in biotechnology. The risk was an economic one:

[1] This concept borrowed from Brian Wynne, "May the Sheep Safely Graze? A Reflexive View on the Expert- Lay Knowledge Divide." In Lash, Szerszynski and Wynne (Eds), Risk, Environment and Modernity 1996, 54.

Canada could fall behind other countries in the innovation race. The government, together with pro-biotechnology advocates, did try to rally public opinion around the idea that biotechnology could be a source of patriotic pride. They claimed that Canada's biotechnology sector was holding a world leading position and that the safety of its regulation of the food system was recognized across the world. Yet, this attempt to rally public opinion around this broad idea of international leadership and national pride in Canadian biotechnology achievements did not have much impact on discourse building.

Opponents to the technology in Canada tried to set off a dialogue about health, environmental and even economic risks. But because of the lack of cohesion between the various groups involved, the modest support they got from the scientific community, and the rather little and superficial press coverage they received, they did not successfully influence public discourse about social risks. In contrast to France, opponents to GMOs in Canada did not try to orient the discourse towards risks related to culture or collective identity. The kinds of links to globalization and American imperialism that resonated in France did not work in Canada. The social movements opposing globalization per se were relatively smaller and Canada's long historical economic relationship with the US was not understood as a subordinate one by most Canadians. In addition, the government's strategy was to invoke Canadian nationalism behind a technology where, they claimed, Canada already had a leading role. If surveys showed that the population was increasingly aware and worried, NGOs opposing GMOs were not able to efficiently rally that public opinion into a force for change. Opposition was not condensed around a precise idea. Rather, it was spread across a series of controversies which the average citizen had difficulty linking together: rBST, CEPA, evaluation process, and mandatory labelling. From the angle of discourse building, opponents to the technology in Canada had fought a series of separate battles without being able to create a common thread between them. So, every time a GMO-related controversy occurred, the government would calm things down and start anew, often buying time by committing itself to more inquiry into the question until the issue was forgotten.

Beck describes a two-stage reflexivity process. At the first stage, society confronts itself with its own rules and institutions, with its own paradoxes, but does not yet reject the predominant system in play with a given technology. In the second stage, the dangers of risk society begin to dominate public, political and private debates. In a risk society, there is recognition that technologies become part of the problem for human and environmental survival, not a solution. This realization creates a favourable climate for reflection and change. Through the controversy over GMOs, both countries engaged in a reflexivity process. However, only one, France, reached the second stage and completed the process and engaged itself in institutional change. This study shows that this outcome was tightly linked to the way each country chose to manage institutional risks.

According to Rothstein, at least two scenarios are possible when a government reacts to institutional change. In the first scenario, the pressure felt by risk managing institutions encourages states to move toward more transparent and perhaps more careful regulations, which could also increase public scrutiny and expose the limits and failure of regulatory institutions. In this scenario, decision-makers enter a circle of quasi-endless demands toward more careful regulations, more transparency and more accountability. The French case fits this profile very well.

In the other scenario, institutional risks create pressures to prioritize the management of institutional risks, creating blame-avoidance behaviour on the part of the regulator. The priority then goes from management of societal risks to management of those institutional risks that create the most pressure upon regulators. Questionable strategies could then be taken up on the part of decision-makers. They could be tempted to maintain a certain transparency deficit to avoid scrutiny. They could engage in costly communication strategies and even propaganda. They can also commit to symbolic actions such as lengthy consultations only to buy time and calm down public uproar. This latter scenario of symbolic actions fits the Canadian narrative rather well.

In both countries, the controversy over GMOs brought the expression of institutional risks that engaged them in the first stage of reflexivity process. In France as well as in Canada, methods, capacity and even intentions of decision-makers and experts were questioned by opponents. But this questioning got a lot more press attention in France. Previous food and health scares had already paved the way to public mistrust in political as well as in expert institutions. The party system had allowed harsh criticisms of the decision-making process to emerge even from within the cabinet. Finally, the government's own questioning of previous orientations and processes coupled with a difficulty to impose its views at the regional and international level, came to add to the expression of those institutional risks. As it was increasingly felt that the government did not have proper control over GMOs, social risks were condensed down to a spectre, an identifiable agent, linked to fear of losing part of the French cultural identity and values. The construction of such an antagonistic spectre caused more intense press coverage and led to stronger public opposition to GMOs. As the dangers of GMOs came to dominate political debates, France entered the second stage of the reflexivity process.

In Canada, institutional risks were systematically managed so as to avoid any change in policy orientations, any rethinking of previous decisions, and any review of existing processes. The government and public administration would dodge questions, deny any problem with the evaluation process, refute any flaw in the regulatory framework, and rebut any claim of conflict of interest within the public administration. It would agree to more studies and consultations only to buy time and would ignore any recommendations that were not in agreement with existing orientations. When it committed to explore ways to instil more transparency and more public dialogue, it took the longest road to achieve it with little change in the end.

According to Giddens, widespread lay knowledge of modern risks leads to awareness and creates public relations problems. Risks, he says, assume a special importance because there are no ultimate unquestionable answers to most of them. This dissertation shows that the management of this aspect was of considerable importance in the final outcome in France and in Canada. In France, it led to the next stage of reflexivity; in Canada, it became a way to stop the reflexivity process before it could get to the second stage, and take too much importance in the public sphere. If the French government wished to regain trust and legitimacy, the Canadian government sought to avoid regulatory and institutional changes that would have led to the questioning of the legitimacy of previous decisions.

Part of Canada's communication strategy was geared at limiting lay-knowledge of risks. All government communications downplayed or denied its existence, giving very little space for expression of concerns about risks and safety issues. It also avoided as much as possible the direct public confrontation of science and expertise and thus the expression of scientific uncertainties within the public arena. Public consultations were designed to avoid these as much as possible. The secrecy surrounding the evaluation process, with no external evaluation, protected greatly in-house expertise from being confronted directly by other parts of the scientific community. If comments were made in newspapers about the safety of the evaluation process, the government was quick to deny and reassure the public. Its close partnership with corporations through communication networks allowed it to pursue an aggressive communication strategy that left little manoeuvre space for opponents. The government went as far as to discredit scientists who dared suggesting that the evaluation system was flawed. The uneasiness with which part of the Canadian scientific community opposed GMOs – allegedly because they feared consequences for their careers - limited greatly their ability to inform the public. With this strategy, risk issues and scientific uncertainty were kept as much as possible away from the public eye and the circulation of knowledge to the public sphere was greatly limited.

The politics were a lot different in France where the government, already busy managing important institutional risks, had to find a way to regain public confidence and to orient the debate away from radical opinions. The French government and scientific experts were feeling vulnerable from the very start of the GMO controversy and were already under high scrutiny from the press. Previous food safety scandals and health scares had created a deficit of trust in regulators and scientific expertise. After some decision-makers and managers were held personally responsible for the harm that was caused during the tainted blood scandal, the idea that decisions about GMOs should not be left exclusively to experts and decision-makers was appealing among senior civil servants. To engage citizens in the debate and share some of the responsibility for decision-making, there had to be a circulation and confrontation of ideas and knowledge other than what was then available in the media. France had to preside over finding a

way to the expression of middle ground ideas which, hopefully, would lead to the emergence of middle ground opinions and ultimately legitimate policies. To achieve this goal, public debate was encouraged between experts of diverging opinions. Lay people were invited to inform and express themselves in public conferences.

This strategy, however, did not allow the government of France to regain control over the debate. The positioning of the government in favour of more precaution and transparency and its apparent hesitation and public questioning of expertise only seemed to give even more credibility to radical opponents. Attempts by the French government to pass on some of the blame to the European level and the challenges of international negotiations only reinforced the then growing pervasive impression that the state lacked the necessary capacity to act in the best interest of France. In the media, this doubt about government efficacy and capacity allowed other actors to come to personify the combat against abusive globalisation. The government eventually lost the image battle to *Confédération paysanne* whose leader, José Bové, came to symbolically replace the government in people's mind, and in the media, as the one true defender of France's culture and autonomy. Concessions of the government, constant adjustments of the framework and pressures toward more precaution and transparency only opened the door for the growing expression of institutional risks. The antagonistic strategy developed by opponents and anti-globalisation movements worked perfectly. The more the French government agreed to change, the higher the demands became.

From this point, and with the participation of the State, France went through the second stage of reflexivity, when risks came to dominate public and private debate and to create a favourable climate for change. And the French government did commit itself to change. Placing itself in contravention of European directives, the French State lobbied Europe for a change of rules that would increase transparency. But the more the government agreed to change, the more intolerant the opponents got. From a "not all is bad" stance, their position evolved to zero tolerance, even in the case of field testing. GMOs in France were eventually depicted as a mega-technological hazard. It is interesting to see that to get out of this political road block and reach the point where it could elaborate rules that would put an end to the *de facto* moratorium, France had to address all three aspects of hazards which Beck describes as not limitable in scope; not accountable according to prevailing rules of causality, guilt or liability; and neither open to compensation nor insurable. In order to end the *de facto* moratorium and comply with new 2001 European directives, France had to adopt a special law, rethink the expert system, increase bio surveillance, enunciate rules for accountability and organise a system of responsibility and compensation in case of health or environmental harm. This lengthy process ended in 2008, with the adoption of a special GMO law with rules that *de facto* created enormous barriers to the introduction of GMOs on the French territory.

Based on this framework, it was hypothesised that, in the absence of evidence of health or environmental harm, social risks related to identity and values have more chance

to have an impact on political outcomes though the production of institutional risks. It was also hypothesized that institutional risks that are related to a lack of trust in the will of the state to protect the public have a higher probability to bring about change than institutional risks articulated around a perceived lack of state capacity or a perceived deficiency in the methods of risk management. But this research has shown that, whatever the type of social risks and no matter how institutional risks are articulated, if those risks do not get to be intensely exposed in the public sphere, they may not have any impact. Risks to common shared values, to collective identity and questions as to the intentions (will) of the state to protect the population may be more difficult to keep away from public scrutiny. They may have the potential to create more serious threats to institutions. In itself, however, risk does not have the capacity to trigger change unless the risk issue comes to confront society with intensity and a constant presence. This research shows that this point is exactly where governments can intervene to protect the status quo, before risks get to confront society. Institutional resilience comes with the capacity to prevent risks to be publicly known and discussed; it comes with the capacity to manage institutional risks.

In concluding this study, we should also turn our attention to the factors explaining the capacity a given government has to manage institutional risks and resist change. In any case, this capacity should be limited by rules and structures that could keep it within the limits of democratic acceptability and in line with the public good. In a sense, this study leads the way to an examination of democratic institutions, their role and their function in discourse building. Between the French government which entered and participated in the second stage of reflexivity and the Canadian government which did all in its power to prevent it, this study identified a few institutional differences that could have given the Canadian government more leverage to control discourse. These differences were related to the party system and its influence on the role of parliament; the role and responsibility of the bureaucracy; the degree of independence of the scientific community; the quality, intensity, and extent of the press coverage; and the vitality and structure of civil society organisations. Further investigation is needed to better understand the impact of these organisational and institutional differences on the ability of governments to control discourse.

In the case of biotechnologies, the level of credibility, legitimacy and involvement of both chambers of parliament in France and Canada played an important role in the final outcome. In Canada, the legislative power is concentrated in the hands of the executive. With strong party discipline and an electoral system that most of the time leads to majority governments, ordinary, backbench MPs have very little power. In France, because governments are often the fruit of coalitions, party discipline is not as strong and the work of the Assemblée nationale seem**s** to be more respected. The electoral system makes room for a plurality of parties, which pushes the government to be more in tune with the parliament if it wants to keep the confidence of the chambers and

push forward its program. The French Senate, being elected by indirect universal suffrage, enjoys a higher degree of legitimacy than the Canadian Senate whose members are nominated by the Prime Minister on a partisan basis. Further weakening of the credibility of the Canadian senate arises from the fact that no previous political experience and no special knowledge of institutions is formally required of appointees.

Because of these differences in the party system, the work of the parliament seems to be more respected in France than it is in Canada. Work of the committees in the French parliament is not completely sheltered form partisan influence but does not seem as vulnerable to government control as in Canada. In Canada, whenever a committee recommendation was not in agreement with the government's orientations, it was ignored or discarded. Furthermore, the party in power sometimes had enough leverage to orient the work of the committees or simply derail it. In contrast, France's Office parlementaire d'évaluation des choix scientifiques et technologiques (OPECST) is very widely respected and enjoys a high level of credibility. The OPECST is the creature of the Parliament, and as such, has the mission to inform both chambers on the consequences of some scientific and technological choices. It is assisted by a scientific board and has the power to conduct studies and evaluations, and to gather the opinion of the most representative civil society associations. In 1998, because it was enjoying a high degree of credibility, it was entrusted with the task of organizing public consultations and the citizen's conference. It also authored some respected reports on the subject.

The neutrality of public administration and transparency of the decision-making process can also come to limit the government's capacity to control discourse. Interviews conducted in France and Canada left the impression that there was, within the French public administration, a better understanding of the duties and limits of the civil servants' role. In France, the École Nationale d'Administration supplies the state with top administrative officers, which insures a meritocratic access to senior civil service. In Canada, the recruitment is done on a more technocratic basis; the state professionals and specialists are recruited according to each department's needs. If Canadian civil servants seem to be just as competent as those within the French public administration, it can be argued that this difference in recruitment standards might be a reason why members of the Canadian public administration that we met seemed to be less aware of their duty to inform the public. Sometimes, they did not seem to have a good understanding of their role within the wider departmental structure. This lack of a precise definition of their role and duties leaves them more vulnerable than their French counterparts to political manipulation. An interviewee previously employed with Health Canada told us that the Canadian public administration had stopped a while ago informing its staff about ethics and conflicts of interest. If this information proves to be correct, Canadian civil servants are pretty much abandoned by their employer and left prey to outside influence. Furthermore, information that came to us concerning the way whistleblowers were treated after the rBST controversy – ignored, suspended and later fired – is an indication that

there might be a problem with the level of transparency and independence of in-house expertise within Canadian public administration. Our findings also indicate that the Canadian public administration had a direct involvement in communication activities and that these communications lacked the level of neutrality one could expect from the public administration. Finally, the absence of a real administrative tribunal might explain this fragility and might partly explain why governments in Canada can opportunistically transform officers of the civil service into political instruments.

The independence of the scientific community is also a crucial element of a democratic process, especially when decisions pertain to science and technology. We then must take a look at the role of science in decision-making and at the way scientific institutions and research councils are structured and managed. Science has an important role to play to support industrial development and innovation. However, the good working of a democratic process also requires its neutral and enlightening participation in open public debates. Such a process speaks to the importance to create, for science and scientists, a political and economic-free zone where they could contribute to the process away from financial interests and economic development goals. The scientific community in France seemed to have more opportunities and latitude to play this kind of independent role.

Media information is also an essential element to limit the power of governments to influence discourse. In Canada, with the two official languages, an impressive geographic expanse and regional differences, keeping Canadians on the same wavelength and raising their awareness over an issue of national implication is a challenge. Media in France do not have to face such a challenge for national information. This was not, however, the only difference. One must also be attentive to the quality of the information the public gets. The press review realized for this study reveals that, in France, the national press offered citizens a more in-depth coverage, did not hesitate to tackle regulatory issues and was very much focused on opponents. In Canada, the Canadian press showed, at one point, a certain editorial bent in favour of biotechnology, offered a coverage that did not emphasize ethical questions, and mostly ignored or misunderstood regulatory issues.

Finally, it can be argued that the strength, diversity, vitality and influence of civil society organisations also have an important impact on possibilities for the government to control the discourse. In Canada, the breadth of the country, language diversity and regional interests create an important difficulty for civil society associations who wish to have a significant influence, especially at the federal level. Regional ties and language barriers have to be overcome to form truly national level pressure groups. Achieving full national cooperation among groups is a difficult task most times in Canada. Consumer associations in Canada have not been able to achieve this kind of nation-wide integration nor did most of the environment defence groups. Even Greenpeace Canada and Friends of the Earth seemed to have difficulties conducting coast to coast campaigns. The federal

government has done little to help NGOs play a more significant role in policy-making. The way subsidies are granted to associations to conduct studies has, on the contrary, created a certain level of competition amongst them. Modes of consultations favoured by the government and its propensity to avoid direct confrontations have prevented these associations from having a significant impact on discourse. French NGOs did not have to face such difficulties. The attitude of the French government towards those associations was also very different from the Canadian attitude. Modes of consultations valued their participation, the confrontation of ideas was more welcomed and demonstrations were more tolerated. In fact, some associations in France came to have more influence on biotechnology issues than the government itself.

This study is a contribution to scholarly reflection on the political role of risks. It is a systematic attempt to theorize the concept of risk and to apply it to the study of public policy. I have brought together in this study some major literature on the social consequences of modern risks to build a methodological and analytical framework that integrates social risks, institutional risks, reflexivity and policy change. Furthermore, the methodological focus on discourse opened up the analysis to variables such as public opinion, communication strategies and policy tools. Until now, few scholars had tried to operationalize and empirically test the concepts and ideas of these meta-analyses of risk and changes within modern societies. And few scholars have examined and compared the case of GMOs in France and Canada using such an angle.

Further studies should test this methodological and conceptual approach by introducing more countries into the comparison. In particular, it would be interesting to compare Canada with countries, such as the UK, whose parliamentary institutions, electoral system and party system are more comparable. Using the method of agreement, it would also be interesting to introduce into the comparison a country such as the USA, whose regulatory choices were similar to Canada. But the framework developed for this study could also be applied to other policy fields involving other controversial technological hazards. Let us think, for example, of the controversy surrounding the exploitation of shale gas, the exploitation of oil sands, or the discourse pertaining to climate change. But even more interesting would be to test this theorization in other public policy fields involving economic, ethical, or identity hazards. For example, it would be interesting to find out how discourse about risk, in the case of the 2008 global financial crisis, induced change - or not - in the rules and institutions governing this sector. The sovereignty debate in Quebec would be another interesting research topic, this time involving identity issues. Examining the 1980 and 1995 campaigns could prove useful to understand how the expression of risk influenced the outcomes. This could be compared to the discourse that prevailed during the dissolution of Czechoslovakia in 1992. Finally, the approach here developed could also be used to compare the orientations taken in different European and North American countries concerning the wearing of *hijab* or other religious signs in schools and public institutions.

In concluding this study, we should also turn our attention to the factors explaining the capacity a given government has to manage institutional risks and resist change. Results suggest that institutional resilience comes with the capacity to prevent risks from becoming publicly known and discussed and with the capacity to manage institutional risks. More research is needed to better understand why and under which circumstances institutions or governments develop such a capacity. We also have to better understand the processes and rules which can keep this capacity within the limits of democratic acceptability and in line with the public good.

LIST OF ABBREVIATIONS

A

Agence française de sécurité sanitaire des aliments (AFSSA)
Agence française de sécurité sanitaire des produits de santé (AFSSAPS)
Agriculture and Agri-Food Canada (AAFC)

B

Biotechnology Action Programme (BAP)
Biotechnology Ministerial Coordinating Committee (BMCC)

C

Canadian Biotechnology Advisory Committee (CBAC)
Canadian Environmental Protection Act (CEPA)
Canadian Food Inspection Agency (CFIA)
Canadian General Standards Board (CGSB)
Canadian Institute for Environmental Law and Policy (CIELAP)
CIRAD (Organisme Scientifique français spécialisé en agronomie tropicale)
Comité consultatif national d'éthique (CCNE)
Comité d'orientation du développement des industries à caractère stratégique (CODIS)
Commission du génie biomoléculaire (CGB)
Commission du génie génétique (CGG)
Confédération française des semenciers (CFS)
Conseil national de recherche scientifique (CNRS) -France

D
Direction générale de la recherche, de la science et de la technologie (DGRST) -France
Direction générale de l'agriculture et de l'alimentation (DGAL) - France
Deoxyribonucleic acid (DNA)

E

Environment Canada (EC)
European Food Safety Authority (EFSA)

F

Fédération nationale des associations de consommateurs du Québec (FNACQ)

G

Groupement national Interprofessionel des Semences et plants (GNIS)

H

Health Canada (HC)

I

Interministerial Biotechnology Committee (IBC)
Industry Canada (IC)
Institut national de recherche agronomique (INRA) - France
Institut national de la santé et de la recherche médicale (INSERM)
Institut de veille sanitaire (IVS)

M
Medical Research Council (MRC)
Ministry of State for Science and Technology (MOSST)

N

National Biotechnology Advisory Committee (NBAC) - Canada
National Research Science and Engineering Council (NSERC) - Canada
National Biotechnology Strategy (NSB) - Canada

O

Office Parlementaire d'Évaluation des Choix Scientifiques et Technologiques (OPECST) - France

R

Regulatory Impact Analysis Statement (RIAS)
Recombinant Deoxyribonucleic acid (rDNA)

S

Science Council of Canada (SCC)

U

Union Française des Semenciers (UFS)
Union des Industries de la Protection des Plantes (UIPP)

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APPENDIX 1

Interview Questionnaires

Questionnaire for Decision-makers - Canada

About the interviewee

1. Could you give us a summary of your professional path of your career and of how and when you have been brought to work on the issue of biotechnology?

About the direction or bureau

2. Which aspects of biotechnology are covered under this direction or bureau? How does it compare to other directions or bureau also working on the topic of biotechnology within the same agency? (health, environment, food, risks evaluation, communication, negotiation)

3. When was your direction or bureau put in charge of these aspects of biotechnology? For which reasons?

4. Since then, has the responsibilities changed to include or exclude certain aspects of the issue? Why and what append (restructured, disengagement)?

5. (If created especially to deal with these issues) When was your direction or bureau created? Was it created using elements from other existing directions or bureaus (which one)? Was it created with new but experienced members, or with members who had never previously worked on the issue of biotechnology?

6. Since its creation, how have the responsibilities evolved?

Internal structure and composition

7. Since its creation or since it was first put in charged of these issues, has your bureau or direction been restructured? Was it to face new challenges or demands emerging from the issue of biotechnology? Procedures, internal rules, adding personnel, adding communication people, more scientists, sociologists?

    a. Anything new in terms of the **composition of the personnel**? [more or less people, more people of certain specialty (communication, public relation, sociology, economy, biology or microbiology)]
    b. Anything new in terms of the procedures? [heavier procedures before reaching decisions (more of less stages before reaching a decision) , rules about speaking to the media, more or less people involved in decision-making, communication strategies]
    c. Anything new in terms of the consultation process with other agencies, directions, or with interest groups? [consulting more experts, using more surveys, more open to the public, open to more or less different points of view] Please describe.

8. Have the events surrounding the rBST crisis (recombinant bovine somatrotrophine) affected or inspired or influenced any of the changes you just described?

9. Participation to the political debate and interactions with other governmental agencies or bureaus.

10. Still in relation to the issue of biotechnology, does your bureau or direction participate to consultation table, study or enquiry commissions or committees? Which one? Is it on a regular basis? Any change in that matter since your direction works on these questions?

11. Which other agencies or directions were participating to these?

12. Which associations were participating to these?

13. Which aspects of the topic have arose the most debate in these forum or events?

14. Were the medias invited, welcomed to these? Did the media show interest about these and how did this translate in the news? Which media showed the more interest?

15. According to you, what influenced did your bureau or direction had on the output of these events (final report, position taking, decisions)?

16. According to you, does your bureau or direction have influence on decision-makers or decision-making at all? Please describe.
    a. According to you, what makes or this influence or this lack of influence?
    b. What about provincial decision-makers?
    c. What about regional or international level instances?

17. According to you, which agency or direction, or bureau, has the most influence on decision-making?

18. According to you, which agency or direction, or bureau, has the most influence on public opinion?

19. According to you, which agency or diretion, or bureau, is the most consulted by the media?

20. According to you, does your bureau or direction have an influence on associations or interest groups?
    a. According to you, what makes for this influence or lack of influence?
    b. What about provincial or regional associations?
    c. What about international associations?

21. According to you, which association has the most influence on decision-making? Why is it so?

22. According to you, which association has to most impact on public opinion? Why is it so?

23. Has the type of information exchanged between your direction or agency and other directions or agencies changes over the years? How (economic, cultural,…who exchanges these information, the amount and frequency)? Why (more or less agencies or directions involved)?

24. Has the type of information exchanged between your direction and associations involved changed over the years? Why and how (more or less associations)?

Information and communication

25. According to you, does your bureau or direction have an influence on public opinion?
    a. According to you, what makes for this influence? What has been done to increase it?

26. Does your agency or direction have a strategy (formal or informal) for communicating or informing **the public**?
    a. **If yes**, please describe it? Is it formal? What did motivate its adoption?
    b. How has it evolved since its inception?
    c. Has this strategy worked well, delivered the expected results?
    d. Has it been the case in every provinces and regions of the country?
    e. If there is **no** strategy of communication or information, is it your opinion that your agency or direction should have one? Is your opinion shared by most of your colleagues?

27. Does your agency or direction have a strategy or policy (formal or informal) for communicating with the **media**?
    a. **If yes**, please describe. How long has it been there? Is it formal?
    b. How has it evolved since its inception?
    c. Has this strategy worked well? Has it delivered the expected results?
    d. Has it been the case in every region of the country?
    e. Has it been the case with all types of media?
    f. If there is **no** such policy, do you think there should be one? For what purpose? Is your opinion shared by your colleagues?

28. According to you, which media has the most influence of the topic?

29. According to you, has the way a decision is brought to the public or media and justified changed since your direction or bureau works on these issues? How has it changed?
    a. International context, international agreements are more often invoked?
    b. Scientific data have to be shown and explained?
    c. Cultural or social impact has to be addressed?
    d. Economic impact has to be addressed?
    e. More or less time and energy has to be spent to explain and defend a decision?

30. Have the rBST events have an impact on decisions concerning communication with associations, the public, or the media?

31. Given that interest groups have increased their activities related to informing and courting public opinion, has this led to changes in the timing and methods that you use for informing the public about policy?

32. At what stages of decision-making do you usually brief the media?

33. What impact have the media and public persuasion campaigns had on your approach to consultation when it comes to policy-making?

Questionnaire for Interest Groups - Canada

About the interviewee

1. Could you give us a summary of your professional path of your career and of how and when you have been brought to work on the issue of biotechnology?

Role of the Group in the area

2. For how long has your group been working on issues related to agricultural biotechnology? Which issues or problems led to you starting to work in this area?

3. What are the two or three most important issues in this area that you are working upon today?

Domestic Policy Community

4. When you think of trying to influence policy-makers in {insert issue or issues mentioned in Q. 2}, upon which departments and agencies in government do you focus your attention? (Probe on MAPA, Santé, Environment, Finances etc.)

5. If you think back over the past 10 years, would you say that you have focused your attention and influence on the same government departments or agencies? Or have some of these become more important in recent years, while others have diminished in importance?

6. When it comes to {insert government departments and agencies mentioned}, would it be normal that they would seek you out to consult with you? Would such consultations come before draft legislation was prepared, after draft legislation was prepared but before it was finalized, or only after a formal proposal had been developed and sent to Parliament?

7. In your experience, do you find that the horizontal coordination between departments and agencies in this policy area of agricultural biotechnology works well? That is, are decisions made in time and efficiently?

8. In thinking about the policy-making process, are there parts of the process which are more open to participation by groups like yours? Which are these? Are there parts that are more closed? Which ones?

9. In this policy area, is it important for you to contact and meet members of the House of Commons and of the Senate? Which members are particularly important to meet with in your view? At what particular times in the decision-making process would you try to meet with them?

10. When you think of the activities of parliament, including parliamentary committees and representations by individual members of parliament, would you say that they have become more or less important as targets of lobbying activities over the past ten years?

11. To what extent is it necessary or useful to meet with the leadership or executives of political parties as well?

12. Do you have regular contact with provincial governments in this policy area? If so, are there provinces that are of particular concern to your group? What kinds of issues are addressed at the provincial level?

13. When you think of the various interest groups and professional associations active in the area of agricultural biotechnology, which of these in your view are the most influential?

14. Among these groups you have mentioned, which ones might sometimes serve as allies or coalition partners of yours?

15. Still thinking of these groups, which of these do you think are your most influential and strongest opponents? Why?

16. If you think back over the past 10 years, would you say that some interest groups and professional associations have become more important? Are there others whose importance or influence has declined?

Policy Community at the International Level

17. Some institutions at the international level are increasingly important when it comes to policy related to agricultural biotechnology. I am thinking here of the WTO, the Codex Alimentarius Commission, the International Plant Protection Convention, the Council of TRIPS at the WTO and the Convention on Biological Diversity among others. Would your association ever try to contact directly or influence any of these organizations?

18. Would you ever seek to contact or influence these organizations by working through another association such as an international one?

19. In thinking about the decision-making processes at the international level, are there **parts of the process which are more open /more closed** to participation by groups like yours? Which are these?

Association resources and expertise

20. When you think of the various policy areas that your association focuses upon, would you say that agricultural biotechnology is taking up more resources and time than it was five or six years ago? If yes, can you elaborate?

21. When it comes to this issue, do you have to use the media and internet more than on other issues? Or do you use the media and internet in the same way as you do for other issues?

22. Do you think that this type of publicity oriented work has gained importance compared to "old fashioned" interest intermediation? Do you invest more resources in designing publicity oriented campaigns?

23. To what extent do your members try more to influence officials on their own? Has this kind of direct political activity by members increased or decreased over the past ten years?

24. Reflecting a moment on the relative importance of own *in-house expertise* for successful interest intermediation, to what extent does a group's own in-house expertise affect the extent to which it might be consulted?

25. Do you think that you are well equipped, better equipped, less well equipped, or similarly equipped to work on policy development as you were 10 years ago?

26. Over the past 10 years, would you say that the importance of adequate expertise has increased, decreased or remained about the same? Do you need new types of expertise today –which ones? To what extent is it necessary to draw on experts to develop policy proposals?)

27. When you look at <name agency>, do you think that the officials involved have the expertise, knowledge and resources to develop the kinds of policies that we need? (Repeat question for the various agencies that have been mentioned in the interview.)

28. Looking back over the past 10 years - would you say that you have more or fewer opportunities to influence how policy is designed and what policy options are chosen? Why?

Internal structure and composition

29. Since its creation or since it first started to get involved with the issue of biotechnology, has your association or group been restructured in any way to face new challenges or demands emerging from the issue of biotechnology? [Procedures, internal rules, adding personnel, adding communication people, more scientists, sociologists, more networking]

    i. Anything new in terms of the **composition of the personnel**? [more or less people, more people of certain expertise (

communication, public relation, sociology, economy, biology or microbiology)]

ii. Anything new in terms of the procedures? [heavier procedures before reaching decisions (more of less stages before reaching a decision) , rules about speaking to the media, more or less people involved in decision-making, communication strategies]

iii. Anything new in terms of the consultation process with agencies, directions, or with other interest groups? [consulting more experts, using more surveys, more open to the public, open to more or less different points of view, more networking] Please describe.

30. Have you noticed any change in the membership that could be related to the way this issue was handled or to the importance that this issue took?

31. Has any particular event triggered or influenced any of the changes you just described? [rBST crisis, the Piercy Schmizer case, refusal of GMO by the europeans, public concerns]?

32. What are the sources of financing of your association?

Communication strategy and public outreach

33. Does your group or association have a strategy (formal or informal) for communicating or informing **the public**?

34. Does your group or association have a strategy or policy (formal or informal) for communicating with the **media**?

35. According to you, which media has the most influence of the topic?

36. According to you, has the way a decision is brought to the public or to media changed since your direction or bureau works on these issues? How has it changed?
    a. International context, international agreements are more often invoked?
    b. Scientific data have to be shown and explained?
    c. Cultural or social impact has to be addressed?
    d. Economic impact has to be addressed?
    e. More or less time and energy has to be spent to explain and defend a decision?

37. Has any event in particular [the rBST, Europe, fear of market loss, manifestations, the impossibility to segregate the seeds] triggered decisions concerning communication strategies with associations, the public, or the media?

38. According to you, does your bureau or direction have an influence on public debate or public opinion?
    a. According to you, what makes for this influence? What has been done to increase it?

39. According to you, which association, group or even governmental agency has had the most influence on public debate and public opinion in the past 5-6 years?

APPENDIX 2

LIST OF INTERVIEWS

INTERVIEWS CONDUCTED IN FRANCE - NOVEMBER/DECEMBER 2001

Gouvernement

Ministère de l'Agriculture et de la Pêche

- Direction Générale de l'Alimentation
- Direction des politiques économiques et internationales
- Bureau Réglementation alimentaire et biotechnologies
- Bureau de la Biovigilance et de l'expérimentation
- Mission communication

Ministère de l'Aménagement du Territoire et Environnement

- Service Affaires internationales
- Direction des études économiques et de l'évaluation environnementale
- Direction de la prévention des Pollutions et des Risques

Économie, Finances et Industries

- Direction générale de la concurrence, de la consommation et de la répression des fraudes

Ministère de la Recherche

- Direction de la technologie, Département bioingénérie

Organismes sous tutelle conjointe

Commission de génie génétique (CGG)

Commission du génie biomoléculaire (CGB)

- Secrétariat de la CGB

Agence française de sécurité sanitaire des aliments(AFSSA)

- Conseil d'administration
- Direction de l'évaluation des risques nutritionnels et sanitaires
- Communication scientifique

Défense de l'environnement et consommateurs

- Union fédérale des consommateurs (UFC)
- France Nature Environnement (FNE)
- Greenpeace France
- Les Amis de la Terre - France

Industrie

- Groupement National Interprofessionnel des Semences et plants (GNIS)
- Plate-forme conjointe Union des Industries de la Protection des Plantes (UIPP)
  UIPP-_Groupement National Interprofessionnel des Semences et plants GNIS
- Association des industriels agroalimentaires (ANIA)
- Industriel de la transformation alimentaire

Agriculture

- Association générale des producteurs de blé et autres céréales (AGPB)
- Association générale des producteurs de maïs (AGPM)
- Assemblée permanente des chambres d'agriculture (APCA)
- Coordination rurale
- Confédération paysanne
- Fédération nationale de l'agriculture biologique (FNAB)
- Fédération nationale des syndicats d'exploitants agricoles (FNSEA)

Recherche

- Comité de Recherche et d'Information Indépendantes sur le génie génétique (Crii-Gen)
- Laboratoire de génétique des populations - CNRS
- Laboratoire d'économie - CNRS
- Institut national de recherche agronomique **(**INRA), direction générale
- Institut national de recherche agronomique INRA –STEPE

Interviews conducted in Canada – 2002

Government

Agriculture and Agri-Food Canada

- Policy Planning and Integration
- Strategic Policy Branch
- Market and Industry Services Branch

Environment Canada

- Communications
- Media relations
- Biosafety protocol

Department of Foreign Affairs

- International Trade

Health Canada

- Food directorate, Office of Food Biotechnology
- Office of Consumers and Public Involvement
- Drug Evaluation, Senior Evaluator

Industry Canada

- Life Science Branch
- Office of Consumer Affairs
- Policy sector

Parliament

- Former federal MP

Semi-public agencies and organisations

- Canadian Biotechnology Secretariat
- Canadian Biotechnology Advisory Committee
- Canadian Food Inspection Agency, International Affairs and Office of Biotechnology
- Canadian General Standard Board, Committee on Labelling of Foods from and not from Gene Technology
- Canadian Intellectual Property Office
- Ag West Biotech (business development organisation)

Research

- National Research Council
- University of Guelph, Department of Plant Agriculture
- Plant Biotechnology Institute, Research & CARC AC on biotech
- Plant Biotechnology Institute, communications
- AgWest Biotech, SABIC
- University of Saskatchewan, SSHRC Chair in Managing Knowledge-based Agri-Food Development
- University of Saskatchewan, Centre for the study of cooperatives

Industry and mixed membership associations that include industries

- Produce Marketing Association
- BIOTECanada, Policy and Public Affairs
- BIOTECanada, Communications
- Canadian Food Information Council
- Canadian Health Food Association
- National Institute of Nutrition
- Agricultural Institute of Canada
- CropLife Canada
- Food Biotechnology Communications Network

Agriculture

- Canadian Seed Growers' Association
- Canadian Federation of Agriculture
- Canadian Organic Growers

- Canadian Wheat Board
- Canadians Grain Council
- Union des producteurs agricoles – QC, comité des biotechnologies

Consumer associations

- Consumers' Association of Canada
- Action Réseau Consommateur et Fédération des associations de consommateurs et d'économie familiale du Québec (FNACQ)

Health and environment defence groups

- Canadian Environmental Network
- Canadian Health Coalition
- Sierra Club of Canada
- Council of Canadians
- Canadian Environmental Law Association
- Greenpeace
- ECT Group
- Canadian Institute for Environmental Law and Policy

APPENDIX 3

Comparative Press Review – 1980 to 1993

As a complement to the historical-institutional analysis and as part of the discourse analysis, a comparative analysis of the press coverage in France and in Canada is here presented. This press review comprises two parts: a qualitative analysis covering years 1980 to 1993, and a quantitative analysis limited to years 1986 to 1992.

Qualitative analysis - methodology

In carrying out the Canadian portion of the review, I relied on a selection of daily newspapers indexed in the *Canadian News Index* and in the *Index de l'Actualité*. *The Canadian News Index* is "a reference guide to the contents of 8 major Canadian English newspapers from "coast to coast": The Calgary Herald, the Globe and Mail, the Halifax Chronicle Herald, the Montreal Gazette, the Toronto Star, the Sunday Star, the Vancouver Sun, and the Winnipeg Free Press.[1]

The *Index de l'actualité*, until 1987, included all articles from *Le Devoir* and only editorial pages, special sections, consumer reports and reports on business from *Le Soleil* and *La Presse*. In 1988, the *Index de l'actualité* started to cover all articles not only from *Le Devoir*, but also from *Le Soleil* and *La Presse*. In 1989, the *Journal de Montréal* was as well included in the *Index*. Table 1 gives a description of the keywords that were used depending on the year and the evolution of the coverage.

The French press review relied solely on the *Index Le Monde* which indexed articles from the French daily *Le Monde*. It was available to us only from 1986. Table 2 gives a list of the keywords that were used to locate articles of interest. For this analysis, we considered that *Le Monde* was a good indicator of the editorial choices that were probably made in other major French newspapers at the time. After all, *Le Monde* was one of 8 main national daily newspapers in France. It was estimated to have the biggest paid circulation with 361,254 copies sold daily in 2002 and one of the highest estimated

[1] As described in 1987.

number of readers with 1.9 M people daily in 2001[2]. As a centre-right paper, we assumed that the press coverage in *Le Monde* gave a fairly good idea of the press coverage in France by other national daily newspapers at the time and that data from *Le Monde* could be extrapolated.

Table 4: Keywords used in Canadian Newspaper Indexes

Index	1980-1983	1984-1992	1993 +
Canadian News Index	Biology Genetics	Biotechnology Genetic Engineeing	Biotechnology Genetic Engineeing Plant Breeding
Index de l'actutalité	Biotechnologie Génétique	Biotechnologie Génétique	Biotechnologie Génétique Genie génétique

Table 5: Keywords used in Index Le Monde

Index	Keywords 1986 +
Index Le Monde	biotechnologie génétique génie génétique

Quantitative analysis – Methodology and Results

The choice of the Indexes and of the time period for the quantitative press review was contingent upon the availability of the data sources and their comparability. Because our analysis of the French newspapers was limited to *Le Monde*, we chose to limit as well the number of Canadian newspapers that were to be included in the quantitative comparison. Because the coverage of the *Index de l'Actualité* had changed quite significantly through the years, we chose not to include it in the quantitative analyses and limited it to the English newspapers indexed in the *The Canadian News Index*. To make this comparison, articles from daily newspapers on the topic of biotechnology (all applications) were added up from newspaper indexes. The titles were examined under a selection of keywords related to biotechnology, genetic engineering and genetics. Key words were selected for their equivalence in terms of coverage. For example, sub category "genetic disorders" of the *Canadian News Index* was included in the broader category of "génétique" in *Index Le Monde*. In this analysis, the title was the source of

[2] Laurent Rivet, *Économie et stratégie de la Presse*, C.S. Presse 2003. www.phnk.com/files/scpo/cs.esp.module1-1-2003.ppt Accessed March 2003.

information concerning the main content of the article. Articles were later classified according to their content to create a sub-group of "articles raising risk related issues". To be included in that category, the title of an article had to indicate that the main object was either regulatory issues, risk issues (environmental, health or socio-economic) or ethical issues. In the case of Canada, the total of biotechnology articles and the total of articles in the "risk related" subgroup was divided by the number of newspapers (8) indexed to create indicators of the press coverage in Canada. Table 3 shows the results of this comparison.

Table 3 shows that, between 1986 and 1992 and on a per paper basis, the number of articles on the topic of biotechnology or genetics was consistently and significantly higher in *Le Monde* than in any of the Canadian newspapers that were included in this study (see also figure 1). Even more interesting, and still on a per newspaper basis, the difference between *Le Monde* and the Canadian newspapers when it came to publishing risk-related articles was even greater. In fact, the occurrence of this type of article was from 3 to 30 times higher in *Le Monde* than in any of the Canadian newspapers that were consulted for this study (see figure 2). The difference was exceptionally high in 1986 and 1988 (16 and 30 times more) and narrowed somewhat starting in 1988 while remaining significant (from 3 to 8 times more).

With a higher occurrence of articles on the theme of biotechnology and genetic engineering, we can conclude that *Le Monde* offered French citizens a significantly bigger exposure to the subject than did any of the Canadian newspapers included in this analysis. And with a much higher occurrence of articles related to regulatory, ethical, and risk issues, *Le Monde* was also, over the same period of time, offering French readers the possibility to be informed on a wider range of biotechnology-related issues than did Canadian daily newspapers that mostly concentrated their coverage on business news.

These differences could be explained by the overture that the French government showed the media at a very early stage of the discussion on biotechnology. Many of the studies that were commissioned on the subject were made public, and perhaps giving them a greater media appeal, the French government had frequently asked for studies on the subject to take socio-ethical issues and risks issues into consideration alongside economic and industrial impacts. In Canada, the discussion mostly focused on the latter aspects of the problem. Besides, in Canada, many studies on regulatory issues were commissioned to private firms or done by concerned departments, and the government did not have the obligation to publicly disclose their findings. These included surveys commissioned by concerned ministries. Finally, it is also possible that the press lacked interest because biotechnology-related events in Canada were less visible and more difficult to grasp. The content analysis presented in the next section tends to support this interpretation. While between 1980 and 1993, France was creating new evaluating structures, taking position on the European directives and later transcribing them into national law, Canada chose to use existing regulations, to avoid any new legislation and

used existing structures to conduct evaluations. Furthermore, the evaluation of regulatory options was mostly done internally or within a closed circle of interested actors, and the regulatory framework was rather complex.

Table 6. Comparison of media coverage from 1986 to 1992. France – Canada

Year	Country	Articles on biotechnology [a] Total (mean / Canadian newspaper)	Articles raising risk related issues [b] Total (% of total) (mean / Canadian newspaper)	Keywords
1986	Canada*	44 (5.5)	6 (13.6%) (0.75)	Genetic engineering Genetics
	France**	20 ---	12 (60.0%)	génétique, biotechnologie
1987	Canada	55 (6.8)	4 (7.2%) (0.50)	Biotechnology Genetic engineering Genetics
	France	44 ---	15 (34.1%) ---	génétique, biotechnologie
1988	Canada	61 (7.6)	13 (21.3%) (1.63)	Biotechnology/ Genetics Genetic disorders Genetic engineering
	France	32 ---	4 (12.5%)	génétique, biotechnologie
1989	Canada	53 (6.5)	14 (26.4%) (1.75)	Biotechnology/ Genetics Genetic disorders/ Plant genetics/Genetic engineering
	France	29 ---	7 (24%)	génétique, biotechnologie
1990	Canada	76 ----- (9.5)	10 (13.2%) (1.25)	Biotechnology/ Genetics Genetic disorders/ Plant genetics/Genetic engineering
	France	29 ---	7 (24.1%)	génétique, biotechnologie
1991	Canada	61 (7.6)	12 (19.7%) (1.50)	Biotechnology/ Plant genetics Genetic engineering/ Genetics
	France	45 ---	13 (29%)	génétique, biotechnologie
1992	Canada	109 (13,6)	25 (22,9%) (3.13)	Biotechnology/ Plant genetics Genetic engineering Genetics/ Genetic disorder
	France	55 ---	14 (25%)	génétique, biotechnologie

* Canada: data from Canadian News Index covering 8 major English newspapers across the country (The Calgary Herald, the Globe and Mail, the Halifax Chronicle Herald, the Montreal Gazette, the Toronto Star, the Sunday Star, the Vancouver Sun, the Winnipeg Free Press).

**France: data from "Index *Le Monde*" from 1986 to 1992 inclusively. This index covers all articles in *Le Monde* under the keywords "biotechnologie » and "génétique".

[a] Including articles classified under "genetic engineering", "genetics" or "biotechnology" and related sub-categories.

[b] Regulatory issues, environmental risks, health risks, socio-economical risks and ethical issues.

Figure 2. Number of regulatory and risk-related articles per newspaper/per year (1986-1992)

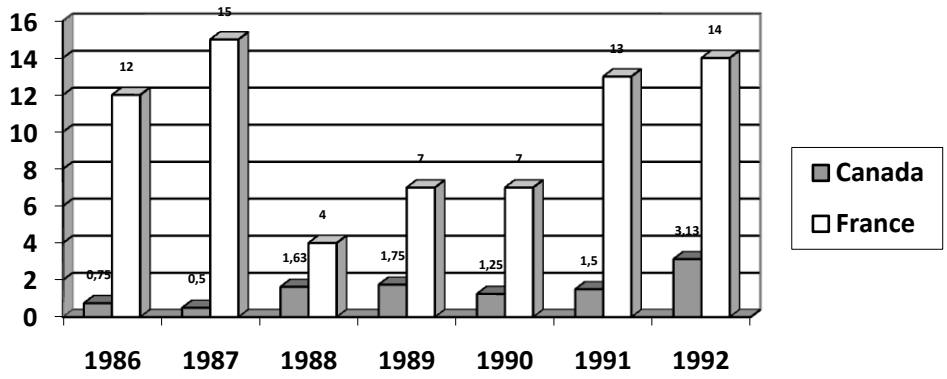
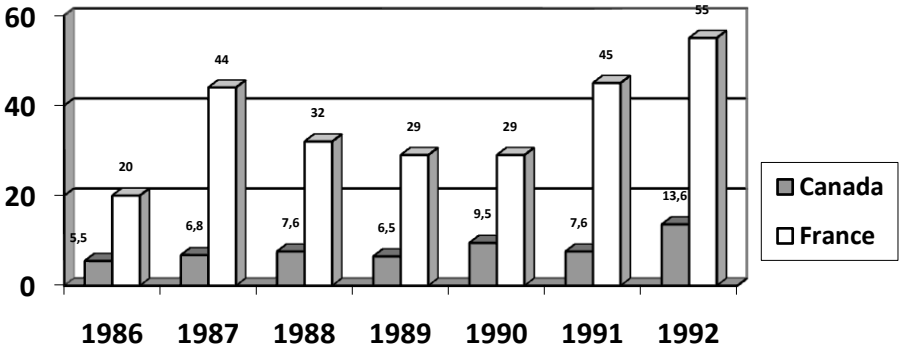


Figure 3. Number of biotechnology articles per newspaper, per year (1986-1992)



Qualitative Press Review - Canada – 1980-1993

Between 1980 and 1994, press coverage in Canada was rather positive with reports on the progress and promises of genetic engineering in the field of pharmaceutical, agricultural products and for environmental recovery. The emergence of a new and lucrative industry was announced. Frequently, the press, citing sources from the science milieu, articles, although not very abundant in comparison to the French coverage, spoke of new vaccines, diagnosis tools, the production of human insulin and growth factors; of bacteria capable of cleaning toxic wastes; and of the production of pests and drought resistant crops. By the beginning of the 1990s, a revolution in agriculture was announced with the promises of miracle food, a diminution of the use of pesticides and the promise to adapt crops to climatic changes and pollution. Agri-food factories would soon replace agriculture as we know it. Futuristic and spectacular scenarios were exposed: giant cows as big as elephants[3], soy that would taste like beef, and low cholesterol pork using human genes were a few examples.[4] But in general, this set of technologies was portrayed as a possible answer to many challenges (energy, resources, health and environment). Ethical questionings mainly came from prospects of abuses in medical applications.

News about public and private investments also frequently made headlines. Federal and provincial governments proudly announced the creation of research centers while, with the exception of a few articles on court decisions about the patentability of living organisms, policies themselves never provided the main substance of an article. Almost no article was dedicated to the 1983 National Biotechnology Strategy or the creation of the NBAC. The same was true of the biotechnology regulatory framework in 1993. These simply seemed to be non-events for the Canadian press which leads to the hypothesis that, at the time, genetic engineering was still marginal within public discourse in Canada. Over a 14-years period (1980-1993), a relatively small number of articles reported on the lack of regulatory guidance, ethical considerations or policy orientations (table 3 and figure 2).[5]

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[3] Jean Poulain, « L'économie qui s'écrit. Les biotechnologies: les relais de l'informatique, » La Presse, mardi 14 juin 1988, sec. D, p. 8.

[4] AFP, « La super-tomate, le soja au goût de boeuf et le porc sans cholestérol garniront bientôt nos assiettes,» La Presse, samedi 30 mai 1992, sec. Plus, p. B6; Presse Canadienne, « Les «usines agricoles» prendront la relève de l'agriculture traditionnelle, » La Presse, lundi 1 juin 1992, sec. C, p.11.

[5] "Growth outpacing power of Parliament. Move on Science, MPs urged," Globe and Mail, 23 November 1982, p. 10; "MPs slack in regulating advances in biological science, [Science Council of Canada] report warns," Montreal Gazette, 23 November 1982, sec. A, p. 7; Brian Milner, "Science Council chairman assails country's record in biotechnology," Globe and Mail, 28 June 1985, sec. B, p. 17; Lawrence Surtees, "Biotechnology seen crucial to resources," Globe and Mail, 20 Septembre 1985, sec. B, p. 9; David Helwig, "Biotechnology Strategy Rapped," Globe and Mail, 1 November 1985, sec. B, p. 15;

Throughout these years, few organisations and even fewer individuals had their positions on regulatory and ethical aspects reported in the press. If some organizations and individuals did asked for more control and more careful regulations, we observed that they attracted little media attention. The Science Council of Canada (SCC), the Canadian Environmental Law Foundation, David Suzuki and Pollution Probe were the main opponents whose viewpoints were reported. They questioned now and then the Federal government's orientations. The press also echoed warnings, in 1982, by the SCC that regulation was needed (2 articles in 2 newspapers), followed by 3 more articles in 1985 covering the essence of another report. In 1984, a total of 4 articles (in 4 different English newspapers) reported on a Canadian Environmental Law Foundation study that pleaded in favour of more regulatory control. It asked that biotechnology "be brought under government control before its products [were] released".[6] In 1988, Dr. David Suzuki was periodically cited in diverse Canadian newspapers. He wanted ethical questions to be discussed rapidly but the number of articles echoing his preoccupations remained relatively low.

In 1991, information concerning 52 new field tests of genetically altered plants in Canada brought Pollution Probe, a Toronto based environmental group, to speak against the testing of products that were conducted, according to this group, without any safeguards to protect the public, in the absence of any specific regulation, and in secret. They argued that "The Canadian people [were] used as white mice and guinea pigs". Not only did this event show the absence of clear regulation for environmental release of GMOs, it also exposed the poorly prepared and uninformed environment defence groups (see also Chapter 9). Outdoor testing had been conducted in Canada since 1988, over a hundred experiments between 1988 and 1990, but environment defence groups were only starting to be aware of this.[7] This small controversy however attracted little press coverage (4 articles in 4 different newspapers in August 1991). These articles were followed, a few months later, by reports on the latest NBAC study stating that biotechnology firms were in need of more legal protection (in form of patent protection), that regulatory delays threatened the survival of these firms and that Canada was lagging behind in biotechnology (6 articles in 4 different newspapers).

"Ottawa helps biotech discover money," Globe and Mail, 12 March 1986, sec. B, p. 21; Lawrence Surtees, "Biotech rules needed now. Ottawa told at a conference," Globe and Mail, 22 December 1986, sec. B, p.8; Dawn King, "Regulation of biotechnology a sea of problems," Globe and Mail, 8 August 1988, sec. A, p. 12; "Society needs quick decisions on biotechnology," Toronto Star, 8 August 1988, sec. A, p. 3.

[6] Eugene Ellmen, "Federal Control of Biotechnology Urged by Report," Globe and Mail, 12 October 1984, Report on Business, sec. B, p. 4.

[7] Martin Mittelstaedt, "Controversial plant tests approved Critics say genetic engineering experiments lack safeguards," The Globe and Mail, Friday August 30 1991, sec. A, p. 1.

Ironically, the start of more consistent media awareness in Canada seems to have been influenced by the way the discourse was evolving south of the border. In 1992, the news that genetically altered foods could be sold in the US without any extra safety tests was forcing a questioning concerning Canada's intentions toward biotechnology food products and the readiness of Canadian regulations. While the food industry was content and expressed its support, the media also echoed some concerns and opposition: Had it been proven that these products were really safe for the public and the environment? Opponents said there was no evidence of this. Danger, as depicted in the newspapers, was a consequence of the US lack of diligence in evaluating these products. Paradoxically, opposition reported in Canadian Newspapers seemed to be coming mainly from the US, with Jeremy Rifkin and the US Union of Concerned Scientists being repeatedly cited.

But companies responsible for the marketing of these products were at the time so confident in the superiority of their product that some, like Calgene with its Flavr Savr tomato, were planning to voluntarily label their products as genetically modified.[8] This opening of the US market to GM foods came in addition to what the media called the "race for patenting of life forms" that was reported to be going on in the US[9] and that was also raising concern in Canada. These developments were putting additional competitive pressure on the industry and on the government to regulate before US products entered the Canadian market.

Qualitative Press Review – France - 1986-1993

Data gathered for this study suggest that risks, along with regulatory and ethical issues constituted a significant part of biotechnology coverage by the French press in the mid 1980s. Data also suggest that, just like the Canadian press, the French press also reported on the progress that new biotechnologies could bring in agriculture, in medicine or to fight pollution, but to our knowledge, it was generally done with more nuance. In

[8] "Designer genes for food approved," The Globe and Mail, Wednesday May 27 1992, sec. A, p. 1; "U.S. allows sale of 'super' foods. Extra safety tests waived on genetically engineered produce," The Globe and Mail, Wednesday May 27 1992, sec. A, p. 10 ; « Gène de luciole dans les flocons de maïs? Pas de tests aux USA, » La Presse, mercredi 27 mai 1992, sec. G, p. 8; « La super-tomate, le soja au goût de boeuf et le porc sans cholestérol garniront bientôt nos assiettes,» La Presse, samedi 30 mai 1992, sec. B, p. 6.

[9] Carole Thibaudeau, « L'effort américain pour monopoliser la connaissance; Des chercheurs des USA ont automatisé les découvertes et les brevètent pour se payer en retour, » La Presse, dimanche 19 juillet 1992, Sciences et techniques, sec. B, p. 5.

Le Monde, articles having risks issues, ethical issues, or regulatory issues as their main object represented 12% (1988) to 60% (1986) of total biotechnology related articles, a proportion significantly higher than in Canada (see table 3 and figure 2). We observed that Le Monde covered regulatory events more often than did the Canadian press. For example, major regulatory changes like the creation of new advisory committees (CCNE, CGB) and new regulatory rules (European directives, Loi de 1992) did attract the attention of the French press. Furthermore, studies such as the Sautier report or the Chevalier report (see chapter 3 and 4), and reports of the CCNE or the CGB were also the object of articles.

With frequent notices made public, the *Comité Consultatif National d'Éthique* (CCNE) did a lot to feed the press with bioethical subjects. Many articles reported on the conclusions of this committee on bioethical issues between 1986 and 1993. In December 1986, a series of 10 articles in *Le Monde* were related to bioethics and mostly nourished by questions posed by the CNE on certain research involving human embryos. It was also remarkable that annual reports of the CGB and opinions by its president were the object of articles in the national press in the early 1990s. [10] In one of those articles, Axel Kahn then President of the CGB, was reported having highlighted the fact that, with the exception of Great Britain, France was the only European country with a real control and evaluation tool for those techniques.[11]

The ecologist movement was not very active in France at the time. Consequently, there was very little echo in the media of their reactions to the subject. In fact, French ecologists were reported to be rather favourable to biotechnologies because of the promises it carried to bring solutions to environmental problems and to reduce pollution.[12] According to Chevalier, there was, however, a switch in the nature of the press coverage by the end of the 80s when it started to be tainted by fear and worries. « Ces technologies attirent de façon accrue depuis quelque temps, l'attention de la presse avec cependant un assez fort changement de tonalité : dominent maintenant l'inquiétude voire la peur à leur égard. »[13] To some extent, this change in the press coverage corresponded with the European Greens' discourse about the testing of genetically modified bacteria that was going on in France and other European countries at the time.

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[10] Axel Kahn, letter to the editor, « Une suspicion injustifiée, » Le Monde, 27 mai 1992, p. 11.

[11] Catherine Vincent, « La commission du génie biomoléculaire a doublé son activité en 1990, » Le Monde, 11 avril 1990, p.12.

12 Sylvia Vaisman, « Les écologistes face aux biotechnologies : plus associés que contestataires. Un entretien avec Brice Lalonde, » Biofutur, Décembre 1987, 23-25.

13 Daniel Chevalier, Les applications des biotechnologies à l'agriculture et à l'industrie agro-alimentaire, rapport de l'Office parlementaire d'évaluation des choix scientifiques et technologiques (Paris : Économica, 1991), p.3.

In 1987, the Arc-en Ciel coalition, a European left-wing ecologist group, spoke against the conduct of field tests of GM bacteria in Germany, UK and France. These tests of GM organisms were reported to be the first worldwide. Genetically modified bacteria resistant to antibiotics had been released in the spring of 1987 in France by INRA scientists and with the support of European subsidies. This decision drove the Arc-en-ciel movement to accuse the European Commission of being an accomplice to what could potentially be the start of an irreversible process. Dangers from such experiments were still unknown or difficult to establish and could lead to a catastrophe, they argued.

Although the controls in France were still optional when public subsidies were not involved, they blamed the INRA, which had its own internal evaluating committee, for not asking for the opinion of the CGB or of the *Commission de classement* before doing the experiment. The Arc-en-ciel ecologists, led by Benedikt Haerlin, a member of the European parliament, requested a moratorium on all experiments and the decontamination of the affected lands. They also asked that the European Commission report on these experiments and that environmental release of GM bacteria be forbidden in Europe until a regulation was in place in all member countries.[14] July 9 1987, *Le Monde* made its headline with "Des bactéries au champs", it reported on the Greens' anger at the European Parliament and raised questions about the necessity of stricter regulations given the risks of misuse and abuse. [15] An editorial in *Libération* even suggested that "*Rhizobium pourrait bien rimer avec plutonium* »,[16] raising fears among promoters that risks of biotechnology be associated with the risks of nuclear energy

The reaction of the French scientific community was also revealing of a fundamental difference in the degree and form of involvement between French and Canadian scientists. While Canadian scientists were rather reluctant to intervene on a personal and individual basis, some renowned French scientists, with prominent roles in biotechnology development, made public statements on the issue of risk. For example, Alain Deshayes, secretary for the *Commission génétique et environnement* even agreed that objections made by ecologists had probably been a good thing in forcing a discussion and bringing more precautions. He however took a position against a moratorium. "Passé le premier traumatisme, nous sommes aujourd'hui favorables d'une certaine manière à la pression sociale. Sans elle, il est probable que nous ne prendrions pas autant

[14] Jean-Marie Boerhm, « Les Verts dénoncent un grave processus irréversible, » Le Monde, 9 juillet 1987, p.10.

[15] « Manipulations génétiques sur les plantes. Des bactéries au champ, » Le Monde, 9 juillet 1987, p.1

[16] From the editorial of Dominique Leglu in Libération, July 1987, p.3 quoted in Christian Vincent. "L'ignorance et la peur." Editorial, Biofutur, No. 60, Septembre 1987, p.5.

de mesures de sécurité. »[17] A few years later, Louis-Marie Houdebine then research director at INRA openly spoke of risks : 'Les techniques modernes de la biologie appliquées aux animaux comportent des risques incontestables pour l'environnement.' In his view, risks related to biotechnologies were mostly linked with the possibility of the loss of genetic variability and increased danger for aquatic fauna.[18] In Canada, the scientific community, with the exception of media icon David Suzuki, was rather quiet on the subject.

The elaboration of European Directives also got the attention of the French press. With the beginning of discussions concerning the dangers of dissemination of GMOs at the European Parliament, the Greens requested strict regulation and a moratorium on market introduction of these products until 1994. If genetically modified plants could solve the problem of world hunger, they argued, they could also very well be the cause of tomorrow's ecological catastrophes. It was the occasion to discuss the risks of genetic engineering and the relevance of a special regulation as this statement made by a French journalist illustrates : «Parce que les spécialistes, aussi enthousiastes soient-ils devant les promesses offertes par les biotechnologies, restent unanimes sur ce point : à bricoler ainsi le vivant, personne, en l'état actuel de nos connaissances, ne peut exclure le risque d'un dérapage, d'une dispersion incontrôlée d'organismes dangereux, voire de la création d'espèces chimères non prévues par la nature. » [19]

In the early 1992, just as the Canadian press, the attention of the French press turned to regulatory developments in the US and the imminence of market introduction of GM foods and plants. But the transcription of the Directives into French law also drew significant media attention because of the controversy over an amendment in favour of mandatory public inquiry. Here again, French scientists openly, and sometimes personally, took positions publicly.

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[17] Alain Deshayes, secrétaire général de la commission génétique et environnement de l'INRA, quoted in Jean-Paul Dufour, « Biotechnologies : la faim et les moyens, » Le Monde, 24 mai 1989, p.17.

[18] Le Monde, 26 juin 1991, p.13.

[19] Catherine Vincent, « Des plantes 'génétiquement modifiées' arrivent sur le marché, » Le Monde, 22 novembre 1990, Supplément, p.8.

APPENDIX 4

Comparative Press Review 1994-2001

Selecting newspapers

For the period between 1994 and 2001, the press review was limited to four major daily newspapers: two in France (*Le Monde* and *Libération*) and two in Canada (*La Presse* and *The Globe and Mail*). They were selected on the basis of the importance of their readership, their status as a national source of credible information, and on the basis of their availability on accessible search engines: *Factiva* and *Eureka's Bibliobranché*.[1]

All these newspapers are known to target middle class readers and offer coverage of national issues. Selected French dailies were clearly of a national scope. But in Canada, because of geographical and language barriers, there was no such thing as a truly national newspaper. Canadian newspapers selected for this study did however reach a significant portion of the national readership and offered coverage of national issues. They each targeted an official language group, were large-circulation dailies and the Globe and Mail was the closest we could get to a national newspaper.

According to the Canadian Newspaper Association, *La Presse* and The Globe and Mail are amongst the 4 best selling daily newspapers in Canada. In 2007, over a seven day period, *La Presse* was reported selling an average of close to 218 000 copies daily, and the Globe and Mail, an average of 337 000 copies daily. [2] *La Presse* is a large-circulation French-language daily newspaper published in Montreal. The editorial bent is said to be somewhat leftist and liberal, especially on social issues and right-of-centre on fiscal issues.[3] *The Globe and Mail* is a Canadian English language newspaper – the one which is most widely distributed across the country. It is based in Toronto and printed in six cities in different regions of the country. With a weekly readership of 935 000[3], it is Canada's largest-circulation newspaper and second-largest daily newspaper after the

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[1] *The Globe*, *Le Monde* and *Libération* were available on Factiva for most of the period studied. *La Presse*, *Le Monde* and *Libération* were available on Eureka. When possible, I used both search engines to extract all relevant articles using a selection of keywords.

[2] The Scoop on Daily Newspapers in Canada. On www.cna-acj.ca retrieved 19/12/2008

[3] *La Presse* from Wikipedia, the free encyclopaedia http://en.wikipedia.org/wiki/La Presse

Toronto Star. *The Globe and Mail* is said to be considered Canada's newspaper of record.[4]

In France, *Le Monde* was considered the French newspaper of record, and was generally well respected.[5] This French national daily evening newspaper is traditionally focused on offering analysis and opinion and is said to be moderate. In 2002, it had the largest paid circulation of all national daily newspapers in France with an average of over 361 000 papers sold daily.[6] Finally, *Libération* is a French daily national newspaper, founded in Paris in 1973 and currently viewed as centre-left. Estimated circulation was of 156 077copies sold daily in 2002.[7]

Goal

Newspaper coverage does not make an event objectively more important than another; it just gives it some visibility for a certain period of time. An event may be important and not be covered at all by newspapers. Thus, this study does not intend to explain editorial choices but to expose them.

From 1996 in France and from 1998 in Canada, significant parts of the biotechnology discourse became public and media became a forum through which different actors tried to influence the discourse about biotechnology. The premise of this study was that media coverage in general and press coverage in particular contributed to shape the discourse on risks and biotechnology. Accordingly, the goal was to describe and analyze press coverage of biotechnology issues as a measure of what readers, and by extension the public and decision-makers, have been exposed to in terms of social and institutional risks. The goal was to describe how risks were articulated and reacted to in the press. The review was also instrumental in identifying relevant actors and evaluating their relative influence in the public debate. Given limited research means, the study of a few newspapers was a way, however imperfect, to introduce the "media" variable into the analysis.

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[4] "*The Globe and Mail*" Wikipedia. http://en.wikipedia.org/wiki/The_Globe_and_Mail

[5] Le Monde from Wikipedia, the free encyclopaedia

[6] As reported to the OJD (Office de Justification de la diffusion). OJD the *Association pour le contrôle de la diffusion des medias*, an association whose goal is to report on the diffusion and the distribution of newspapers and other publications that serve for publicity. (See Presse Grand Public available on www.ojd.com/observatoire/2003 and www.ojd.com/engine/adhchif/chif_fiche.php?adhid=625 also in www.lemonde.fr/qui-sommes-nous/article/2002/02/05/le-monde_261404_3386.html) Accessed October 2010.

[7] As reported to the OJD (Office de Justification de la diffusion). OJD is an association whose goal is to report on the diffusion and the distribution of newspapers and other publications that serve for publicity. (www.ojd.com/chiffres/section/PPGP) Accessed October 2010.

Referencing and Selecting Articles

Articles were retrieved using the search engines that were available and on which the selected newspapers were archived for the time of the study. Search with Factiva excluded recurring pricing and market data as well as obituaries, sports and calendars but included republished articles. In journalism, it is common knowledge that the main topic is usually mentioned very early in the article. A key-word search on full articles would have brought a great number of irrelevant articles to enter the selection. Consequently, articles retrieved with the help of Factiva were limited to those in which one of the key words appeared in the headline or the first paragraph; because of particularities of Eureka's *Bibliobranché*, search was limited to the title and the first two paragraphs.

In Canada, articles on rBST were retrieved using specific key-words (rBST, growth hormone, somatotropine). The recombinant growth hormone is not a genetically modified organism but a product of biotechnology that increases milk production. It is in fact interesting to notice that, in Canadian newspapers, this topic which was the first public controversy over genetic engineering was most of the time not directly linked to the wider theme of biotechnology. Its coming into market in Canada was, however, seen by authorities as a test for market introduction of other biotechnology products.

The search for relevant articles was not limited to agricultural biotechnology because it was believed that the wider discourse about this very wide set of technologies could have contributed to the general awareness about agricultural biotechnologies. Articles selected with the help of the search engines had to have biotechnology or some aspect of genetic engineering (broadly understood) as their main topic to be included in the analysis. Articles strictly giving information about the market share values of biotech firms or about these companies' transactions were rejected. Letters to the editor and editorials were included. All those that were kept were summed up as the total number of articles on the topic per year.

Total relevant articles were split up into two categories. The first category comprised those articles which strictly informed the public of a new research breakthrough, new technological applications or important market or business news. The acquisition of Pineseeds (terminator) by Monsanto and the fusion of Rhone-Poulenc and Hoechst to form Agrevo are examples of what was considered relevant informational material. This category also included objective and neutral reports on the introduction and development of new biotechnology products or processes, whatever the sector of application (agriculture, environment, research or medicine).

The second category included articles reporting on a controversy, a policy or a regulation. These articles directly or indirectly questioned political, social, ethical, regulatory or economic aspects of the issue, described and/or explained policies and

regulations, or reported on actors' opinions. This second category was named "reflexive" because of its capacity to trigger or support a form of reflection or questioning by those who read it. For example, it included articles on the purposes and ethical aspects of cloning, on property rights over inventions of biotechnology, on economic goods and bads of technology changes, critiques and analysis of regulatory developments, labelling issues, traceability, etc. These articles are summed up in the tables that follow on a per paper and per country basis. For comparison's sake, statistics concerning "reflexive articles" were also presented as a proportion of the total of relevant articles found per newspaper per year and identified as "percentage of reflexive articles".

Quantitative analysis

For every newspaper, we observe that the total number of articles on the topic tends to increase from 1994 to 2001 (Table 1 and 2, figure 1). In 1994, reports on biotechnology were still marginal to moderate. From that point in time, all four papers saw a steady increase in the total number of biotechnology articles published. But from 1997 in France and 1998 in Canada, the number of articles increased sharply. In Canada, *The Globe and Mail* augmented its coverage a year earlier than did *La Presse* (1998 vs 1999).

It is also worth noticing that, taken together, selected Canadian newspapers consistently published more articles on the topics than did selected French newspapers taken together (figure 2). In fact, of all four newspapers studied, and for almost every year of the study, it was *The Globe and Mail* which maintained the highest score of published relevant articles on biotechnology (figure1).

Parallel to this increasing coverage of biotechnology was the growing number of reflexive articles published by daily newspapers. For the French newspapers, the increase in the total number of reflexive articles began slowly and was constant from 1996 to 2000, with a slight decrease in 2001. For Canadian newspapers, there was a clear cut, dramatic increase in year 1999 (see figure 3). Also, when comparing French and Canadian newspapers an important difference appears. From 1996, the French newspapers published more reflexive articles on the topic than selected Canadian newspapers did (figure 3); and they did this even though French newspapers had published fewer articles on biotechnology than had their Canadian counterparts. Figure 4 shows that the difference between France and Canada in the total number of reflexive articles was especially high in 1996, 1997 and 1998, before the emergence of the public controversy in Canada. After the public controversy started in Canada, the number of reflexive articles published in Canada increased sharply, but remained lower than in selected French newspapers.

Another key difference appeared between the biotechnology coverage of French and Canadian newspapers. In 1996, which is from the start of the controversy in France, reflexive articles began to outnumber general articles on the topic. It never was the case in Canada where, even after the start of the controversy in 1998-99, general articles, especially neutral business news, continued to represent the bulk of the biotechnology articles.

In 1999, 2000 and 2001, the gap between France and Canada narrowed (figure 4). La Presse was publishing slightly more reflexive articles on the issue in 2000 and 2001 than was Libération (figure 3). But put together, selected French newspapers were, in 2000 and 2001, still publishing more reflexive articles than were selected Canadian newspapers. Moreover, the proportion of reflexive articles in French newspapers was constantly and quite dramatically higher than in Canada (figure 5).

These findings suggest that, although readers of national French newspapers were exposed to a smaller number of articles than were Canadian newspaper readers, French readers were exposed earlier and more intensely to the risks aspects of the issue. Articles in France more often presented a critical and analytical side to the issue. Canadian newspaper readers, in contrast, started to be exposed to controversies almost three years after their French counterparts and kept being exposed to proportionally less reflexive articles than the French readers. Although regulatory changes and controversial biotechnology-related events were happening at the time in Canada, it seems that it took longer for Canadian newspapers to pick up on the contentious and regulatory aspects of the topic.

Table 7. Articles on biotechnology, reflexive articles on biotechnology and proportion of reflexive articles in two French daily newspapers from 1994 to 2002.

	Le Monde			Libération			Total		
Year	Total	reflex.	%	total	reflex.	%	total	reflex.	%
1994	14	6	43	NA	NA	NA	-	-	-
1995	23	9	39	13	6	46	36	15	42
1996	37	22	59	28	24	86	65	46	71
1997	80	52	65	51	40	78	131	92	70
1998	119	92	77	46	41	89	165	133	81
1999	150	101	67	99	82	83	249	183	73
2000	152	114	75	101	84	83	253	198	78
2001	159	123	77	83	62	75	242	185	76

Table 8. Articles on biotechnology, reflexive articles on biotechnology and proportion of reflexive articles in two Canadian daily newspapers from 1994 to 2002.

	La Presse			The Globe and Mail			Total		
Year	Total	Reflex.	%	Total	Reflex.	%	Total	reflex	%
1994	26	8	31	72	18	25	98	26	27
1995	41	8	20	48	9	19	89	17	19
1996	59	3	5	77	12	16	136	15	11
1997	60	8	13	80	11	14	140	19	14
1998	56	3	5	199	30	15	255	33	13
1999	173	57	33	194	76	39	367	133	36
2000	208	96	46	236	62	26	444	158	36
2001	202	95	47	224	62	28	426	157	37
2002	148	46	31	171	34	20	319	80	25

Figure 4. Biotech articles per newspaper (1994-2001)

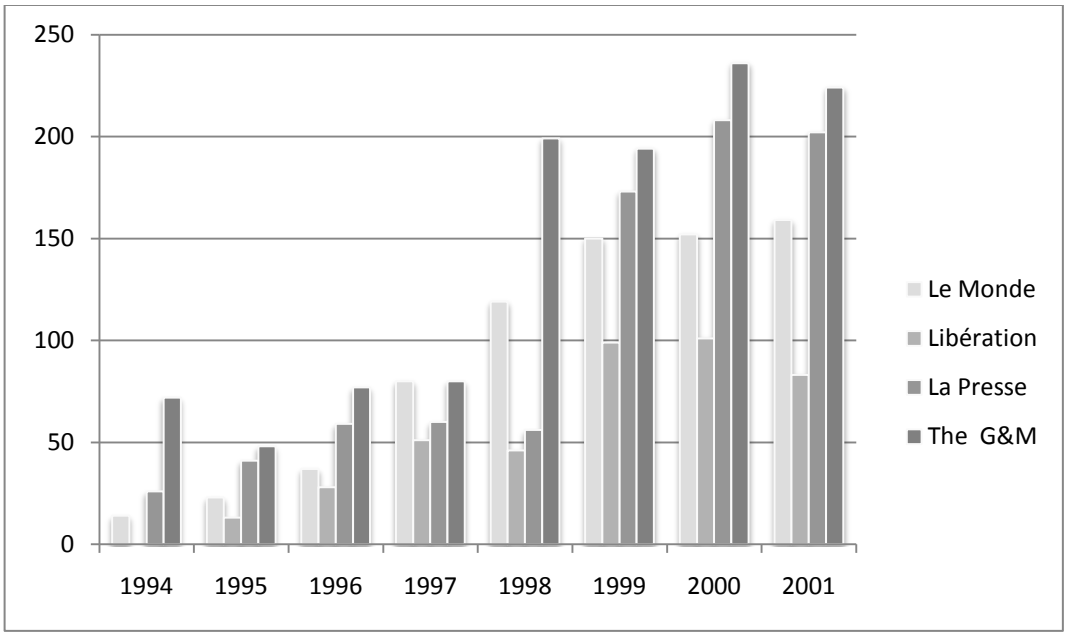


Figure 5. Biotech articles in Selected Newpapers, Summed results, France and Canada (1994-2001)

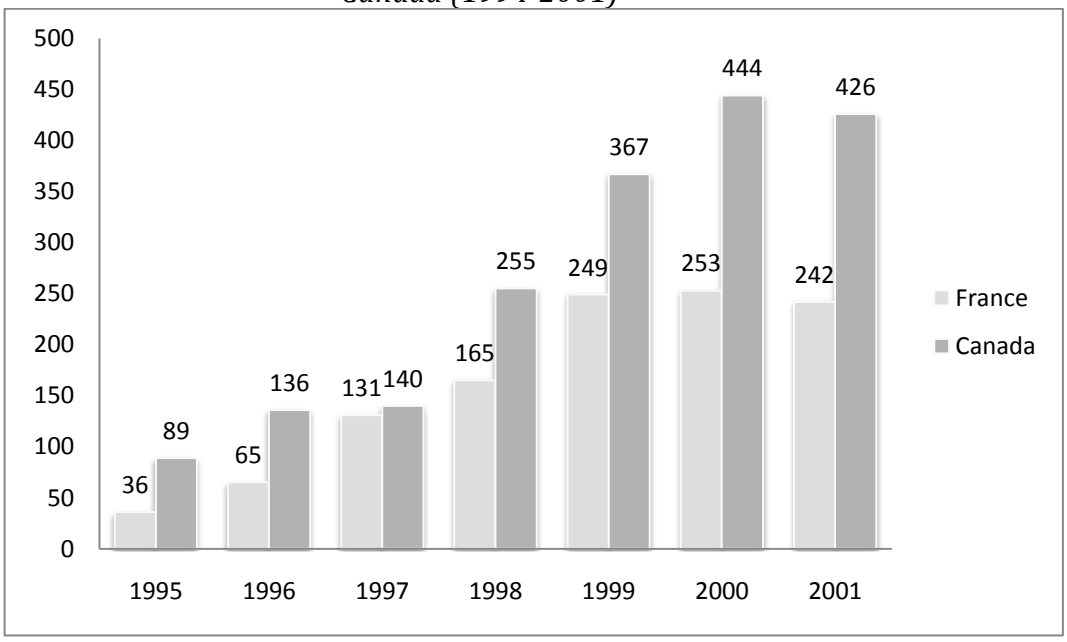


Figure 6. Reflexive biotech articles in selected newspapers (1994-2001)

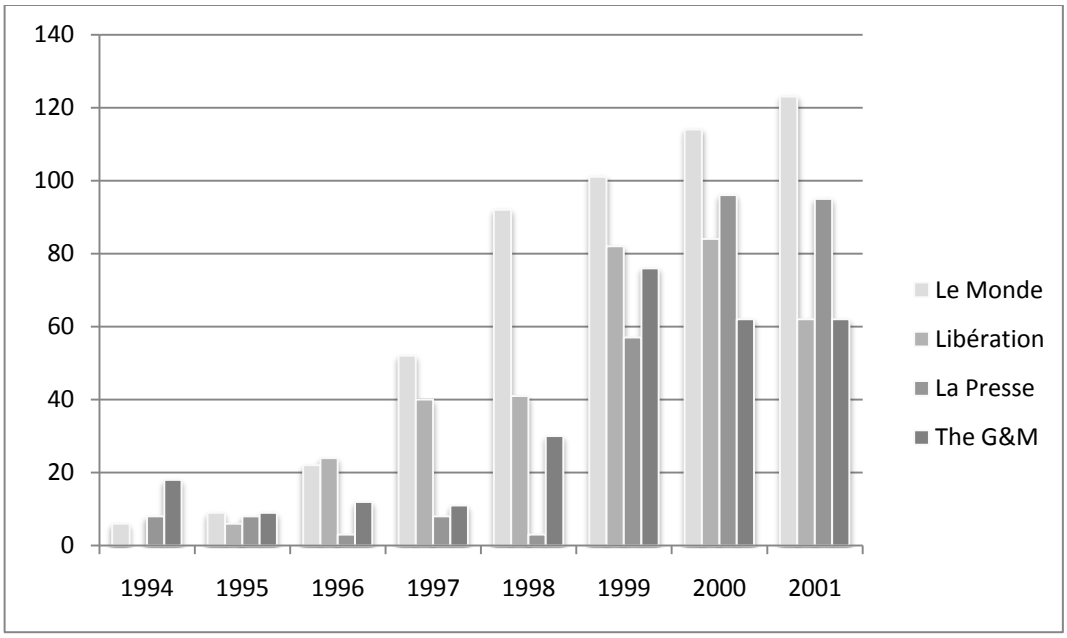


Figure 7. Reflexive biotech articles in selected newspapers. Summed results, France and Canada (1994-2001)

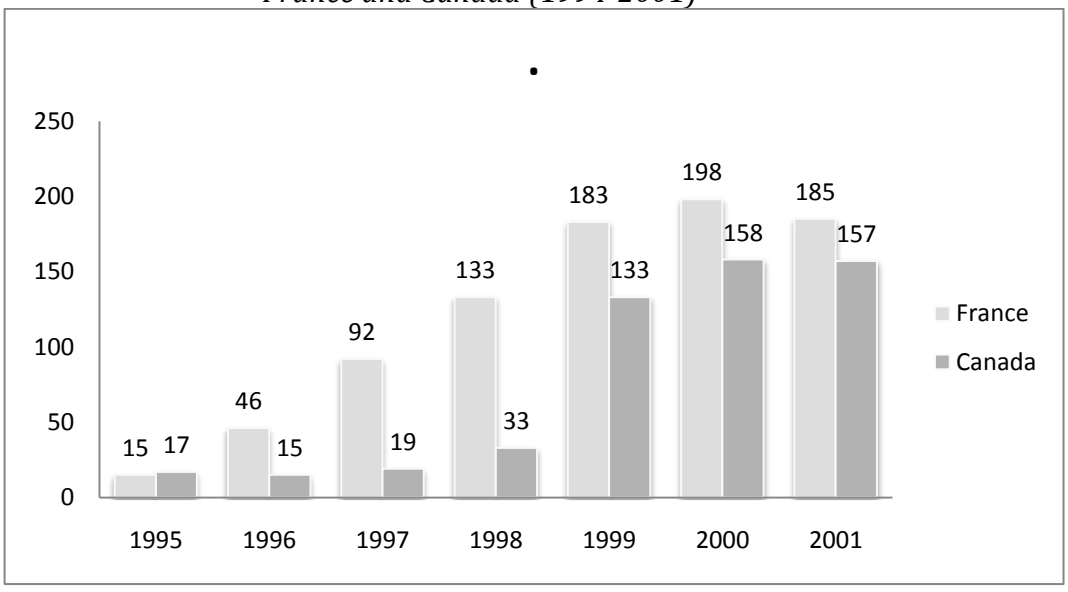


Figure 8. Percentage of reflexive articles in selected newspapers (1994-2001)

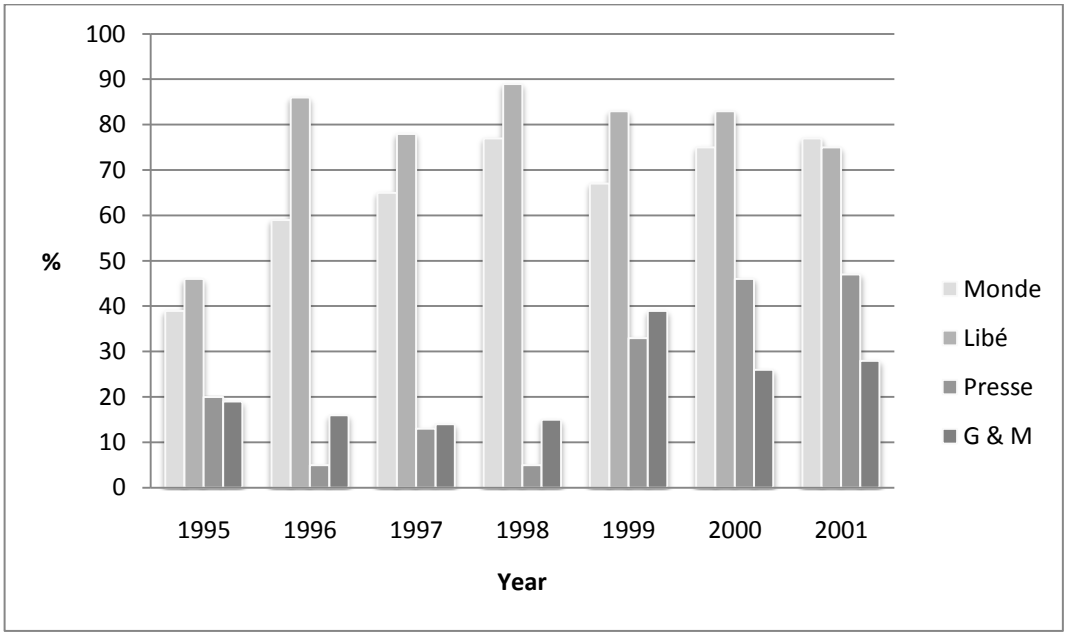
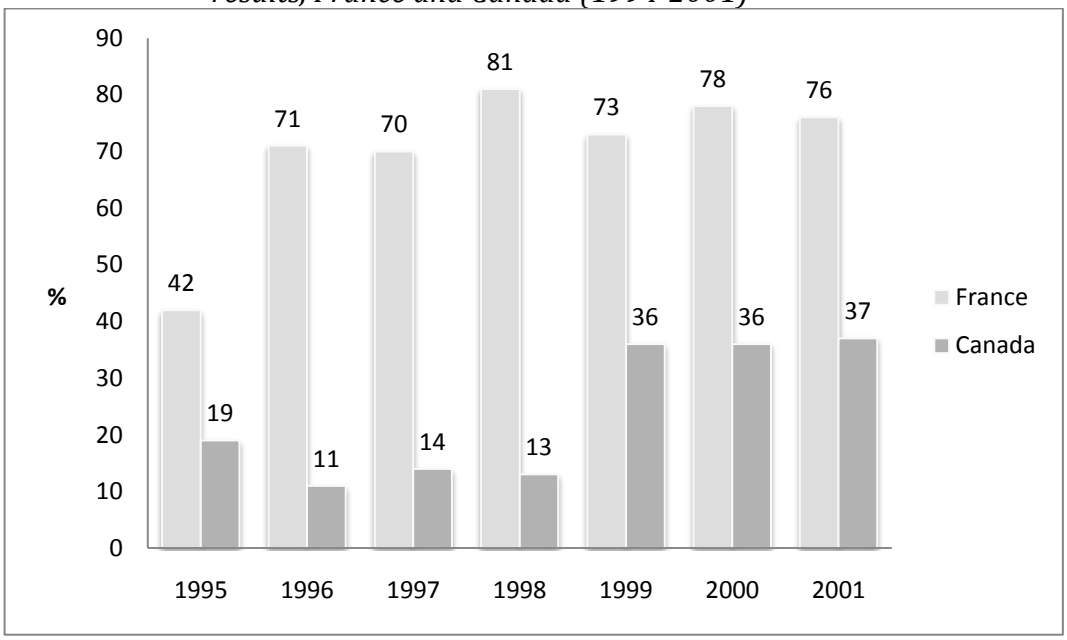


Figure 9. Percentage of reflexive articles in selected newspapers. Summed results, France and Canada (1994-2001)



Press review – France from 1994 to 2001

France before the controversy

In 1994 and 1995, press coverage in France was sporadic and mostly focused on scientific discoveries and market news. According to Joly, biotechnology was then mostly covered by scientific journalists who had, in general, a positive bias towards innovation.[8] Only a few articles targeted regulations or questioned risks to health or the environment. This pattern remained for the most part of 1996.

Before November 1996, biotechnologies were still covered sporadically by French daily newspapers but the tone and focus were beginning to change as the first GMOs were about to receive market authorisation. In the beginning of the year, there were reports that the first GMOs were literally about to enter the European market. Articles on the subject led the reader to think that GMOs were already starting to make their way to the table of French consumers. Newspapers were also announcing that the EC did not intend to reinforce controls over transgenic food or to inform consumers in any special way.[9] In May, Le Monde also reported that a group of European scientists - of which half were French - publicly asked for a moratorium on the dissemination of GMOs into the environment because, in their view, science could not, at this point, foresee nor predict risks.[10]

It was however not before the fall of 1996 that the controversy started to intensify in the media.[11] The first GMO, herbicide tolerant soy from Monsanto, had just received an authorization from the European Community and a decision was imminent for Novartis BT corn. The first cargos of soy and corn containing small proportions of their GM versions were ready to enter the European market.

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[8] Pierre-Benoit Joly et al.. L 'innovation controversé: le débat public sur les OGM en France, Janvier 2000,

[9] Catherine Vincent and Marcel Scotto, « Dans l'assiette, la génétique gardera son mystère. Selon un règlement européen, l'information du consommateur sera minimale, » Libération, 13 mars 1996, p. 8; « L'Europe renonce à renforcer le contrôle sur les aliments génétiquement modifiés, » Le Monde, 14 mars 1996, p. 8.

[10] Catherine Vincent, « Des chercheurs réclament un moratoire sur les cultures « transgéniques, » Le Monde, 30 mai 1996.

[11] In 1996, for Libération, 20 out of 28 articles on the subject were published after November first. For Le Monde, it was 20 out of a total of 38 articles. Joly and collaborators made a similar observation on a total of 30 media sources in France (general newspapers and specialized publications). They believed that, from that point in time, connexions between GMOs and other social themes became more frequent and articles more often analysed the issue in a more horizontal and complex way. Pierre-Beno*it* Joly *et al.. L 'innovation controversé: le débat public sur les OGM en France,* Janvier 2000, p. 73.

Alerte au soya fou!

On November 1st, *Libération* published a series of articles on the subject with its first page titled "Alerte au soja fou". A parallel had already started to be made between GMOs and events such as the mad cow disease or tainted blood.[12] With this front page, Libération however succeeded in creating a long lasting and evocative connection between the mad cow disease events and the emerging issue of GMOs.[13] Libération's front page served to establish, according to Joly and collaborators, a link between the probable impact of GMOs on human health and the collective health scare that was ESB at the time.[14] This association between GMO and mad cow disease was presented as sufficient reason to mistrust experts and regulatory authorities:

> *« Fabricants et importateurs assurent que ce mutant ne présente aucun danger, mais l'affaire de la vache folle a appris aux consommateurs européens à se méfier des discours rassurants. »* [15]

> *« L'arrivée sur le marché européen du premier aliment génétiquement modifié montre que la leçon de la crise de la vache folle - on ne joue pas impunément avec la nature - n'a pas encore été tirée par l'Union Européenne. Car des doutes sérieux persistent sur l'innocuité pour l'homme et pour l'environnement de ces aliments. »*[16]

From November 1st 1996, risks and decision-making became objects of more scrutiny by the media. The topic became political with press reports of political actors publicly questioning, accusing and blaming opponents to their vision.

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[12] For example, a reader argued that GMOs come from the same power and mercantile logic as mad cow disease and tainted blood. In Denis Limagne, Courrier du lecteur, «Culture transgénique, » Le Monde, 15 juillet 1996; Also, a representative of the Confédération paysanne (representing over 20% of farmers at the time), speaking in front of a parliamentary mission pointed out to a similarity in logic between mad cow disease and the use of transgenic plants or BST: Jacqueline COIGNARD, "La vache folle émeut la Confédération paysanne. Le syndicat dénonce le modèle productiviste, » Libération, 18 juillet 1996; See also Michel Beaud, "Les raisons d'une folie," Le Monde, 16 avril 1996.

[13] Libération used this formula again to refer to GM soy and corn : « Soya fou : les industriels reculent » « Mais fou : prudence des européen, » Libération, 14 November 1996 and 15 November 1996 respectively; « La faux contre le colza 'fou' », Libération, 9 juin 1997, P.18.

[14] Joly et al, « L 'innovation controversée, » P.73.

[15] Vincent Noce, « Le légume américain a été transformé pour résister aux pesticides, » Libération, 1er novembre 1996, p.2.

[16] Jean Quatremer, « Bruxelles n'a pas tiré les leçons de la vache folle Les directives européennes s'opposent à un étiquetage spécifique, » Libération, vendredi 1 novembre 1996, p. 3.

If attacks on institutions and experts continued to create favourable conditions for institutional risks, [17] the food industry itself contributed to create some more doubts about the regulatory system. In mid November, having fresh in mind the mad cow disease events, Carrefour, the most important food distributor in Europe, announced that it did not want GM soy in any of the products sold in its stores before there were certainties about their safety and asked for the labelling of these products.[18] Almost simultaneously, Food giants Unilever and Danone announced that they would not use American GM soy in the making of their products because of the public's worries.[19]

Perhaps the most interesting aspect of the press coverage in 1996 was the impression left to the reader that France was about to be insidiously invaded by American GM products; and that authorities were neither ready nor willing to contain this invasion. Even though some of these genetically modified varieties were developed by European companies, they pretty much all ended up being called "American". Two plant varieties were predominantly the subject of press coverage in Le Monde and Libération: American Monsanto's Roundup Ready soy and Swiss Novartis Bt Corn. Yet, it was Monsanto that came to be depicted as a threat. For example, an article recalled that Monsanto was the maker of Agent Orange and accused the company of inventing this glyphosate tolerant soy to sell more of its own pesticide (Roundup).[20]

Swiss owned or American owned, GM crops were at the time being grown in America and exported from America. Mixed in small proportion with regular seeds and exported to Europe, they were depicted as an American invasion and, by the end of 1996, began to be associated with the bad sides of globalisation.[21] For example: *« L'arrivée en Europe de cargaisons de récoltes américaines issues de semences génétiquement modifiées est une première pour nos estomacs: la biogénétique agroalimentaire n'en est*

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[17] For example, the Green party's spokesperson, Dominique Voynet, attacked the decision of "so-called CGB experts." in Vincent Noce, "Les écologistes contre le soja transgénique. Les Verts réclament un étiquetage et Greenpeace appelle au boycott du légume génétiquement modifié,» Libération, samedi 9 novembre 1996, p. 12.

[18] Pascal Galiner, « La grande distribution ne veut pas du soja génétiquement modifié,» Le Monde, 14 novembre 1996.

[19] « Soja fou : les industriels reculent, » Libération, 15 novembre 1996, P.15.

[20] "Une firme de la chimie a inventé ce nouveau soya pour vendre plus de pesticides" in Guy Dupuy, « Révolution, » Libération, 1er novembre 1996, P. 3. He also refers to a « technology made in outre-atlantique. »

[21] Corinne Bensimon, « Le maïs transgénique arrive en Europe, » Libération, 10 décembre 1996, P.21; « Bruxelles devrait autoriser le maïs américain génétiquement modifié, » Le Monde, 18 décembre 1996; Jean Quatremer, « Le maïs transgénique entrera en Europe sous pression américaine. Bruxelles a autorisé la commercialisation,» Libération, 23 décembre 1996, P. 22.

qu'à ses balbutiements, et, comme d'habitude, la technologie made in outre-Atlantique a une longueur d'avance. » [22]

These headlines illustrate the state of mind that was starting to be prevalent in the press. Risks were starting to take the form of an imposition, from the outside, of a product that did not meet local values. Europe, it seemed, was unable to offer legal protection against this American threat. Pressures were too big. Risks were not only to health or the environment; they were beginning to be related to a possible difficulty or lack of capacity of the authorities to take decisions.

> *Que reste-t-il de la "forteresse Europe", ce slogan anti-européen lancé par les Américains au début des années 80? Peu de choses. Dernier exemple, l'autorisation de commercialisation du maïs génétiquement modifié accordé mercredi par la Commission européenne. Les stocks de maïs américains entreposés depuis le 1er octobre dans des ports européens vont pouvoir se déverser sur le continent. Il faut dire qu'une décision contraire aurait abouti à une guerre commerciale avec les États-Unis, le maïs transgénique (0,6% de la production américaine) étant mélangé au maïs "normal".*[23]

In 1997, the French press continued to show an interest in cloning. The birth of Dolly, the cloned sheep in the UK, created some commotion and many articles focused on the scientific progress that could emerge, or not, from this technological advance. Ethical aspects were also discussed, with a special focus on the ethical implication of human cloning. At the same time, GMOs were also the focus of an increasing number of articles. The authorization of BT corn by the European Commission in December of 1996 gave way to a series of decisions and counter-decisions on the part of the French government that no doubt had the potential to lead the public to question the competence of the authorities. Labelling continued to be the focus of many claims and criticisms and the occasion to question the loyalty and intentions of the European authorities. Labelling standards were very difficult to establish in such a politically explosive context and it led the reader to wonder whether labelling would become compulsory before GMOs were introduced onto supermarket shelves. Finally, 1997 was marked by the announcement, by the newly elected left coalition government of Lionel Jospin that a public debate would take place in 1998 before any other product was to get an authorization.

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[22] Guy Dupuy, « Révolution, » Libération, 1er novembre 1996, P.3.

[23] Jean Quatremer, « Le maïs transgénique entrera en Europe sous pression américaine. Bruxelles a autorisé la commercialisation,» Libération, 23 décembre 1996, P. 22.

Novartis BT corn

Press coverage in 1997 was marked by the authorisation that had taken place on December 20, 1996, of Novartis BT corn by the European Community. Novartis BT corn had first been evaluated in 1995 by the French CGB. Given the favourable opinion of this advisory body and on the recommendation of the Conseil supérieur d'hygiène de France, Novartis' application had been submitted by France to the Commission of European Communities in March 1995. Evaluation at the European level was long and difficult because opinions were divided on the impact of a marker gene to ampicipline, an antibiotic. Unanimity could not be reached within the Member States. Committee 21 and the Council of the ministers of the environment could not, alternatively, reach a decision. At last, BT corn was evaluated by 3 scientific committees which concluded, in December of 1996, that it should be authorized to be grown and sold in Europe. This decision was transmitted to France in January 1997 and, by February 4th, a decree of the minister of Agriculture authorised Novartis BT corn to be grown and sold in France.

In the meantime, it seemed that French society had become uncomfortable with GMOs. Following the ESB crisis and in the face of unexpected media attention that the first authorisation had triggered, the French government was redefining its position. France, which up to this point had been perceived as a "promoter" of GMOs because most European field trials had been done on its territory, was now almost overtly hostile. The government was suddenly bending to the Greens' critiques and taking a position that had the potential to block the entry of GMOs. Philippe Vasseur, then Minister of Agriculture, demanded that GMOs be labelled.[24] President Chirac later publicly made the same demand.[25]

The issue became obviously political when, on February 12th, the Juppé government withdrew its authorization to grow BT corn while maintaining the authorization to sell the same product for consumption.[26] Perceived as a disavowal of the

[24] « Philippe Vasseur étiquette le maïs transgénique, » Libération, 21 décembre 1996, p.15; Noce, Vincent. « Vasseur bloque le maïs transgénique, » Libération, 9 janvier 1997, p.23.

[25] « Jacques Chirac a exigé, hier en conseil des ministres, qu'aucun aliment transgénique "ne soit mis sur le marché français tant que le problème de l'étiquetage n'aura pas été résolu"» in Vincent Noce, "Chirac Bloque le maïs transgénique," Libération, 16 janvier 1997, p.22; also in in « Les Docteurs Folamour du marché,» éditorial, Le Monde, 18 janvier 1997.

[26] Catherine Vincent, « Alain Jupé interdit la culture du maïs transgénique, » Le Monde Vendredi, 14 février 1997, p. 30

expertise of the CBG, this decision was soon followed by the resignation of Axel Kahn, president of the CGB since its inception.[27]

In France, the elections of June 1997 saw a change in government when a coalition of the left, lead by Lionel Jospin, took power. This "cohabitation" government included Dominique Voynet, as the Minister of the Environment. As leader of the Green Party, she had previously spoken publicly in favour of labelling and had been very critical of the CGB's expertise. The Jospin government, pressed by public opinion as well as by economic and scientific stakes, soon launched a cross-ministerial consultation to define a rule of conduct for GMOs and rethink the decision on BT corn. On November 27 1997, the decision and a political statement were presented at a press conference that was attended by no less than 4 ministers and 2 secretaries of state[28]. Genetically modified plant varieties that can cross-pollinate with native varieties such as soy or sugar beet were not going to be allowed in France but Novartis BT corn would finally be authorized. This decision was based, according to the government, on an evaluation made by experts of the *Comité de prévention et de précaution* (CPP). Experts of this committee, the government argued, came to the conclusion that BT corn did not present any risks to the environment.

This decision to allow BT corn came with a series of measures designed as a public policy for GMOs. A public debate was to be launched. A surveillance system was to be put in place to monitor any eventual environmental impact of BT corn or of any other GM variety that could be authorized in the future. In an effort towards more transparency, clear labelling of GMOs was to be compulsory. Finally, the Ministry of Health was to be requested to give its opinion on any GM product before it received authorisation to be sold in France.

The French press, which had been awaiting this decision, responded to the invitation. The decision made headlines in both Le Monde and Libération.[29] Both newspapers explained and analysed different aspects of the decision and the policy but it was the decision to allow Bt corn to be grown in France that drew attention the most.[30]

Members of the Socialist Party, the Green Party and ecologists' movements were reported to be against the authorisation given to Novartis BT corn and were publicly very virulent towards a Minister of the Environment who was supposed to be on the side of

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[27] « M. Kahn, Président de la Commission du génie biomoléculaire, démissionne, » Le Monde, 20 février 1997.

[28] Agriculture, environment, research and education, European affairs, health and "PME".

[29] « Feu vert au maïs transgénique, » Le Monde, 28 novembre 1997, p. 1; « La génétique dans votre assiette. La France autorise la culture du maïs transgénique, » Libération, 28 novembre 1997, p.1.

[30] 20 articles on GMOs in Le Monde between 28 November 1997 and the end of December; during the same time, in Libération, 12 concentrated in this issue.

environmentalists.[31] Greenpeace was reported to accuse the government of surrendering to the interests of the multinationals.[32] In a long letter to the editor, the government was accused of having ridiculed the precautionary principle as well as democratic rules in a decision made furtively and without consultation. Even worse, they implied that the government had bent to the pressure of the United States and the multinationals. They concluded that no lessons had been learned from the mad cow disease events:

> *« Comme si l'affaire de la « vache folle » n'avait pas servi de leçon, notre gouvernement vient de donner une nouvelle dimension aux menaces de dénaturation et d'appauvrissement de la biodiversité. (…)*
>
> *Outre le fait qu'elle implique des risques pour notre avenir que nous ne maîtrisons pas aujourd'hui, cette décision prométhéenne est aussi la marque d'une abdication devant l'hégémonie de l'agriculture américaine dont nous devenons les cobayes, contraints et forcés. (…) Ce sont les États-Unis et les grandes entreprises qui ont imposé ce choix au gouvernement. Par l'absurde, il vient de démontrer, une fois de plus, que les grands choix techniques n'appartiennent pas aux politiques, mais aux grandes entreprises et aux techniciens qui en dépendent et en vivent. »*[33]

Bringing some more doubt on the value of the government's decision, the President of the CPP, whose report had been used to justify the decision to authorise BT corn, published a communiqué to inform the press that it had been misinterpreted. According to them, all risks of environmental impact could not be rejected : *"…les experts ont souligné la possibilité de risques de transfert inter-espèces" et ont recommandé "expressément l'interdiction de mise sur le marché de toute variété qui en contiendrait (comme c'est le cas pour la variété de maïs Novartis)".*[34]

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[31] « Mamère critique la couleuvre avalée par Voynet, » Libération, 1 décembre 1997, p.12; « Noël Mamère juge « inacceptable » que Dominique Voynet ait « cédé sur la mise en culture du maïs transgénique ». » Le Monde, 2 décembre 1997, p.26; « Le maïs transgénique rend fou le PS, » Libération, 4 décembre 1997, p.14; « Des députés socialistes et écologistes critiquent la décision du gouvernement sur le maïs transgénique, » Le Monde, 5 décembre 1997; « Un grain de maïs dans la méthode Jospin, » Le Monde, 5 décembre 1997, p.8.

[32] « Greenpeace dénonce le feu vert français à la culture du maïs transgénique,» Le Monde, 29 novembre 1997, P.3.

[33] Marie-Hélène Aubert et Noël Mamère. « Génie génétique et génie politique,» Letter to the editor. Le Monde, 5 décembre 1997.

[34] « Maïs : déclaration du Comité de la prévention et de la précaution (CPP), » Le Monde, 6 décembre 1997, p.8.

Under attack, Dominique Voynet soon announced that the government would not authorize any other transgenic plants containing a resistance gene to an antibiotic before public consultation took place. [35] In newspapers, the government however kept being under attack: What motivated the government to take such a decision in such a rush and before public consultations took place?

The November 27 1997 decision seemed to have greatly contributed to trigger increased opposition to GMOs in general and to BT corn, its materialization. Opponents had shed doubts on the intention and competence of the French government and its experts. Even with a member of the Green party as the head of the Environment ministry, the government was having a hard time regaining some credibility as a regulator. It seemed that, by trying to reassure public opinion, the Jospin government had triggered some more discontent and suffered even more attacks on its intentions and capacity. This trend continued and even amplified in the course of 1998 with opposition from civil society organizations getting more organised and united to fight GMOs.[36]

The conference of citizens that was announced in November 1997 took place in June 1998 and received much attention from the Press in part because of its newness in France. It was the occasion for a diversity of viewpoints to be expressed publicly. It did not however contribute to calm down the opposition to GMOs. For some, citizens were consulted after the fact and Bt corn was still, and more than ever, the object of resistance since the government held to its decision to authorize it.

In 1998, opponents fought on two fronts. They intensified protests and, on some occasions, raised it to the level of civil disobedience. They also brought the fight to the judicial level when they filled a request in suspension against the Jospin decision before the *Conseil d'État*, the French administrative tribunal. Their actions attracted much press coverage and contributed to further erode trust in government decisions.

Civil disobedience symbolically indicated that opponents felt the issue was dramatic enough to justify taking unlawful actions in a situation where authorities did not protect the environment and the population in an adequate way. The demand for the suspension and annulation of the decree authorizing BT corn contributed to create a

[35] Catherine Coroller. « Les Plantes modifiées retoquées. Le gouvernement durcit les critères d'autorisation des céréales transgéniques, » Libération, 10 décembre 1997, p.18; « Le gouvernement n'autorisera pas la culture de nouvelles plantes transgéniques tant qu'un débat n'aura pas lieu, » Le Monde, 11 décembre 1997.

[36] For example, the campaign in favour of a moratorium was reported to be lead by 8 different environmental and consumer associations: Agri pour l'environnement, Alliance paysans écologistes consommateurs, Confédération paysanne, Conseil national des associations familiales laïques, Ecoropa, France nature environnement, Greenpeace, Léo Lagrange consommation et Nature et progrès. In "Deux cent mille signatures pour un moratoire, » Le Monde, 23 juin 1998, p.10.

situation where, on the one side, the government was seen to be defending GMOs against the precautionary principle while, on the other side, opponents were defending environment and health.

Fortunately for the French government, Europe was there to defer some of the blame and the Commission's ineffective decision process was described as a retreat in the face of the well determined forces promoting free trade and globalisation. All through 1998, newspapers frequently referred to the inability of European authorities to agree on labelling rules; they highlighted the fact that GMOs might already be on supermarket shelves without proper labelling; and they reported on Greenpeace's efforts to attract attention to the absence of labelling standards. Furthermore, France refused to authorise GM rapeseed/canola varieties that had already received the green light from the European commission, which contributed to attract attention to the necessity to adjust the European authorisation process. Finally, the debate was somewhat drawn into the issue of the autonomy of the Member States when the Conseil d'État asked the European Court of Justice to give its opinion on the capacity that France had to block the entry of a GM variety, which already had an authorisation at the European level.

Protests

The year 1998 was also characterized by civil disobedience and protests against transgenic crops.[37] Ecologists, farmers and consumer associations launched, early that year, a campaign against GMOs (Alerte aux OGM). Protest went as far as civil disobedience when a group of farm union militants of Confédération paysanne destroyed stocks of GM seeds in a Novartis plant in January. They indicated that they feared that Bt corn could transmit resistance to antibiotics to humans. They also announced their intention to transform their court trial into the first trial of transgenic corn.[38] If destructions did not draw much attention from the press, the law trial however succeeded in directing the debate towards the risks of GMOs.

« Au-delà des faits reprochés aux trois prévenus, l'audience fut surtout l'occasion, pour les témoins de la défense, d'exposer les craintes que leur inspire

[37] « Un moratoire sur le maïs transgénique est réclamé par plusieurs associations,» Le Monde, 30 janvier 1998. « Manifestation contre le maïs transgénique,» Libération, 4 février 1998, p.17. « Opération anti-maïs transgénique à Paris, » Libération, 2 mars 1998, p.22. « Manifestation contre les Organismes génétiquement modifiés, » Libération, 20 avril 1998, p.18.

[38] Elian Da Silva, « Maïs transgénique – la désobéissance de trois syndicalistes agricoles,» Le Monde, 19 janvier 1998.

> *ce maïs Bt, seule plante transgénique à avoir obtenu en France (et pour la première fois en Europe) une autorisation de mise en culture.»*[39]

Furthermore, infringing on what was then defined as the consumers' right to know, the press reported that GMOs were already, theoretically, on French supermarket shelves. *"Les consommateurs ne veulent des plantes transgéniques, mais ils en mangent déjà à leur insu. »*[40] Negotiations at the EU level were creating delays because of the impossibility of Member States to agree on labelling rules. This situation was denounced in the press and it led to some actions on the part of Greenpeace. It took GM products out of the shelves in a grocery store right before the citizen's conference and it published, in November of that year, a "black list" of products containing GMOs.[41]

The citizen's conference

The message of the government, during 1998, was that no other transgenic crop was to be authorized in France before European rules guaranteed transparency and traceability (mostly through labelling rules).

> *« Pour nous, les choses sont claires. On arrête les autorisations et on attend de s'être mis d'accord au niveau européen sur les règles de traçabilité et de transparence. »*[42]

With the citizen's conference, it was hoped that a public debate would be launched on sound basis.[43] The government was most probably hoping that the panel of citizens would not go against what had been previously decided and was obviously counting on the citizens' conference to help get it out of the situation. However, as the list of themes that the citizens had to explore showed, it seemed that the Jospin government was honestly taking steps towards a better and increased public participation.

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[39] Catherine Vincent, « Trois agriculteurs opposés au maïs transgénique comparaissaient devant le tribunal d'Agen, » Le Monde, 5 février 1998.

[40] « Neuf aliments testés positifs aux OGM, » Libération, 28 mars 1998, p.21. « Un soupçon de transgénique dans les assiettes, » Libération, 8 avril 1998, p.19.

[41] « Le coup de poing de Greenpeace contre le maïs transgénique, » Le Monde, 19 juin 1998, p.31. Sylvia Zappi, « Greenpeace diffuse une « liste noire » des produits contenant des OGM,» Le Monde, 4 novembre 1998, p.13.

[42] « La secrétaire d'État Marylise Lebranchu fait le point sur les Organismes transgéniques. Suivre le produit de la culture jusqu'à l'aliment,» Libération, 20 mars 1998, p.19.

[43] Quoted from Jean-Yves Le Déaut, OPECST in Catherine Vincent, « Les citoyens appellent à la prudence face aux plantes transgéniques,» Le Monde, 23 juin 1998, p.10.

From the Minister of Agriculture's own statement, the objective of the conference was for the public to enter into a debate which was not only scientific but also philosophical and ethical.[44]

The Office parlementaire d'évaluation des choix scientifiques et technologiques (OPCST) was put in charge of organising the June 1998 citizens' conference. A panel of 14 neutral « candides»[45] citizens was recruited. These people were briefed on the subject over 2 week-ends in April and May. After that, they were invited to formulate questions around 5 themes: environmental impact, health risks, consumer information, legal questions and decision making in a controversial context. They then selected experts that were invited to answer their questions. After the conference, they were asked to prepare a statement that was communicated to the media. The OPECST prepared a report that included the recommendations of the conference of citizens.

Before the conference started, the OPECST organised public hearings in the form of round tables to stimulate a debate between diverging opinions. Even though the press was invited to attend these debates where experts, interest groups and even ministers debated, Le Monde was one of only a few newspapers to publish an article on the subject: *"Le Monde est l'un des rares journaux qui parlera de ces auditions, centrant le papier publié sur la question des résistances aux antibiotiques soulevée par P. Courvalin. Les propos du Ministre de l'Agriculture L. Le Pensec ne sont pas repris alors qu'ils constituent une véritable rupture dans le discours public de ce ministère »*[46]

Most probably due to its novelty, the citizens' conference succeeded in pushing the subject further onto the public agenda. With significant press coverage, it was the occasion for many interested actors to express themselves. It was the occasion for newspapers to expose a range of contradictory opinions, from industries to ecologists. At the conference, an important petition was submitted. It was signed by no less that 200 000 people and asked for a moratorium on commercial use of GMOs until a national debate took place in agriculture. [47]

It also was the occasion for scientists to discuss risks publicly. In so doing, they also exposed the extent of scientific uncertainties concerning GMOs:[48]

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[44] Catherine Vincent, « Un débat public sur les plantes transgéniques va être organisé, » Le Monde,14 février 1998.

[45] "Ingenuous" or "innocent", as they were sometimes referred to in Libération and Le Monde.

[46] Joly et al., 74.

[47] « Deux cent mille signatures pour un moratoire,» Le Monde, 23 juin 1998, p.10.

[48] A report by INRA, just a few weeks before the conference, was described as a sort of "anthology of doubts" in Corinne Bensimon, « Les transgéniques poussent-elles trop vite? » Libération, 15 juin 1998,P.33-34.

> *«… l'attitude de la trentaine d'experts qui participent au débat surprend d'emblée. Par la force de leurs convictions, et surtout par la défiance qu'exprime un grand nombre d'entre eux vis-à-vis d'une précipitation excessive des pouvoirs publics à lancer ces nouveaux produits sur le marché. Une prudence qui, au fil des débats, paraît d'autant plus relever du bon sens qu'à la plupart des questions posées ne répondent que des connaissances partielles, voire contradictoires. »*[49]

For the occasion, industries were trying to influence public opinion with a publicity campaign that did not produce the expected outcome. It, however, did not go unnoticed. Some denounced the overwhelming presence of publicity paid by the industry in Le Monde between June 12 and 23, just before the conference.[50] In Libération, industries were said to try to "force" GMOs upon the population with what looked like an election campaign or lobbying.

> *« C'est parti, comme une campagne électorale. Depuis le début du mois, l'industrie agro-chimique, productrice des plantes transgéniques, a lancé une campagne de séduction de l'opinion française, aussi délicate qu'une entreprise de lobbying. (…) Tous s'abstiennent de prononcer les mots "plantes transgéniques", jugés sans doute horrifiques. »*[51]

Libération and Le Monde produced rather different accounts of the panel's recommendations. For Libération, citizens were asking for a moratorium when the panel recommended waiting for the conclusions of the scientific community before authorising GMOs to be grown commercially and when the citizens' panel asked for more ecological risks research to be done before GMOs were spread in the environment.[52] In Le Monde, it was reported that that citizens said "yes but" to GMOs. It was also reported that a moratorium did not have a consensus among the citizens but that a series of recommendations contributed to reinforce some of the doubts that had been raised about the decision process: there should be a reform of both the composition and procedures of the expert evaluating committees; the use of marker genes from antibiotics should be

[49]Catherine Vincent, « Les citoyens appellent à la prudence face aux plantes transgéniques,» Le Monde, 23 juin 1998, p.10.

[50] Thomas Ferenzi, « Arrogante publicité? » Le Monde, 29 juin 1998, p.22. « Examen de passage » populaire pour les plantes transgéniques – Les messages des industriels, » Le Monde, 20 juin 1998, p.24.

[51] Corinne Bensimon, « L'agro-chimie part en campagne. Les industriels misent sur la pub pour orienter le débat public,» Libération, 16 juin 1998, p.34.

[52] « Conférence des citoyens sur l'introduction des plantes transgéniques. Les candides penchent pour un moratoire, » Libération, 23 juin 1998.

avoided in the future; and trustworthy and credible labelling was needed.[53] Le Monde also concluded that the principle of precaution was central during the conference and that experts consulted during the conference often transformed the discussion into the trial of money and globalisation.

> *« Le "principe de précaution" a été au centre des débats de la Conférence de citoyens sur l'utilisation des organismes génétiquement modifiés (…) Parmi les experts sollicités, plusieurs ont rejoint les associations de défense de l'environnement et de consommateurs pour réclamer un moratoire sur les plantes transgéniques. »*[54]

Following the citizens' conference, the government decided to adopt a two year moratorium on 3 varieties of transgenic oilseeds already authorized at the European level. Two other varieties of transgenic corn, however, received authorization to be grown in France.

Conseil d'État

The controversy was far from over. A judicial action against the decision to authorise BT corn had a decisive impact in feeding the debate in the media. In mid September 1998, the press reported that the Conseil d'État was asked to examine the February 5, 1998, decree authorizing BT corn to be commercially grown in France. This event received important coverage, especially in Le Monde (17 articles from mid-September to the end of the year). Ecoropa, Greenpeace and the Confédération paysanne were behind this judicial action. They argued that procedures and rules which led to the decision to authorise Bt corn to be grown in France did not respect the precautionary principle and that environment and health risks had not been properly evaluated before this decision was taken.[55]

The decision of the Conseil d'État to suspend the authorization while examining the request was described in Libération as a "slap in the face" for the government. Not only did it add to the apparent incoherence of the situation, it suggested to the public that environmental and health risks were serious enough to justify this additional precaution.[56]

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[53] « Le « Oui mais » des citoyens aux plantes transgéniques,» Le Monde, 24 juin 1998, p.24.

[54] « Les citoyens et la génétique, » accroche de une, Le Monde, 23 juin 1998, p.1.

[55] Hervé Kempf, « Le Conseil d'État examine l'autorisation du maïs transgénique. Plusieurs associations demandent la suspension de la mise en vente prévue pour novembre,» Le Monde, 17 septembre 1998, p. 32.

[56] « Un camouflet au gouvernement. » in « Pas de semailles pour le maïs transgénique, » Libération, 26 septembre 1998.

In this court case, the precautionary principle, as described in the 1995 Loi Barnier, was opposed to the Loi du 13 juillet 1992 on the environmental dissemination of GMOs. The government's commissioner had to defend the decree, placing him and, by association, the government on the side of the promoters of GMOs. The government commissioner's opinion was reported in the media: the precautionary principle, as described in Loi Barnier, did not have a compelling judicial value: « *une formule de recommandation générale, non applicable directement*».[57] Opposing the government, Greenpeace and the Confédération paysanne were pictured as being on the side of more and better environmental protection.

Giving a dramatic twist to this event, Confédération paysanne members went as far as saying that, if the Conseil d'État were to agree with the government that the decision to authorize BT corn was compatible with the precautionary principle, citizens would be legitimized to use civil disobedience actions. At least 3 such actions had already been committed by members of the Confédération paysanne since the beginning of the year.

> *« Selon René Riesel, secrétaire national de la Confédération paysanne, "si l'État se montrait défaillant sur ce point, nous serions en situation de non droit. Il nous semble que quiconque détruirait des parcelles emblavées en OGM serait fondé à le faire." »(...) « L'État pourrait devoir faire face à des paysans pratiquant l'interventionnisme anti- OGM. »* [58]

Furthermore, this court case was one more occasion for the press to associate GMOs with globalisation and to suggest that GMOs were, in fact, a tool of American ambitions toward a form of cultural and economic hegemony.

> *« D'une part, sur le plan économique. Les OGM ne sont-elles pas le cheval de Troie d'une agriculture américaine conquérante, de plus en plus structurée autour de firmes biotechnologiques géantes ? D'autre part, sur le plan environnemental et social. Le développement des cultures transgéniques ne contredit-il pas les impératifs nouveaux d'une agriculture plus respectueuse de l'environnement, structurée autour de moyennes exploitations dont on cherche le maintien ? »*[59]

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[57] Hervé Kempf et Rafaele Rivais, « La France est d'accord pour engager à nouveau le débat européen sur les OGM, » Le Monde, 21 septembre 1998.

[58] Herve Kempf, « La menace d'une guérilla "anti-OGM", » Le Monde, 28 septembre 1998, p.8.

[59] «OGM : un débat stratégique,» éditorial, Le Monde, 28 septembre 1998, p.13

Ultimately, the Conseil d'État asked, in December 1998, for the opinion of the European court of justice.[60] Did France have the obligation to authorise BT corn on its territory once the green light had been given by the EC? While waiting for the decision, which could take between one to 3 years, the Conseil d'État decided that all authorisations would remain suspended in France. The debate about BT corn, along with some of the blame, was thus displaced to the European level. The European regulation was now said to be inapplicable.[61] The autonomy of the states was a central question. In this case, who should have the last word?

> *« Mais le tir est puissant : le ballon a dépassé la touche pour se porter sur un autre terrain, celui de l'autonomie des États par rapport à la Commission de Bruxelles. Dans l'interprétation d'une directive où s'enchevêtrent instances de décision communautaire et nationales, qui doit avoir le dernier mot ? C'est la question que pose le Conseil d'Etat.»*[62]

Press coverage in 1998 ended on an anti-globalisation note. Attention was drawn to the complexity of the process of authorisation at the European level and Europe's inability to position itself convincingly one way or the other, with the result that it was unable to protect against the American lead free-trade ambitions.

> *« Le forcing bio-techno laisse, pour l'instant, la gouvernance européenne médusée et pareille à un bouchon de liège sur l'écume d'une déferlante. L'ambiguïté des choix gouvernementaux n'est pas le fruit d'un simple accident de parcours. La valse-hésitation sur le mode " courage, fuyons " révèle une incapacité chronique à aborder de manière entreprenante la lame de fond libre échangiste sur laquelle caracole la politique des multinationales du génie génétique agricole. La poussée de fièvre OGM n'est pourtant commandée ni par l'urgence sociale ni par la nécessité alimentaire, et le bégaiement des gouvernements européens procède avant tout d'un manque de lucidité, d'ambition et de dessein prospectif en contrepoint du projet libre-échangiste nord-américain. »*[63]

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[60] «Le Conseil d'État saisit la justice européenne, » Libération, 12 décembre 1998.

[61] Hervé Kempf, « Les OGM englués dans le labyrinthe européen, » Le Monde, 14 décembre 1998, p. 8

[62] « Maïs et souveraineté, » Le Monde, 14 décembre 1998, p.13

[63] Lionel Brard, « Les multinationales de l'agrochimie ne doivent pas imposer leur volonté,» Le Monde, 18 décembre 1998, p. 14.

In 1999, the transnational and international sides of the issue became more visible in the French press with the Cartagena Protocol and the Seattle international trade negotiations. The press frequently reported on the difficulties met by certain countries such as Brazil, China or UK to decide on legislation in a context of growing controversy. Risks also started to take shape, with reports on the impact of BT corn on Monarch butterflies, the implications of the "terminator" technology and stories about the controversial findings of Arpad Putzai. Reports of food companies deciding that they would not use or sell GMOs also contributed to give credit to the thesis that GMOs could, indeed, present dangers.

Now that the authorization for the only GM crop allowed in France was suspended until a decision of the ECJ, opponents started to attack the legitimacy of field trials. The destruction of experimental parcels attracted the attention of the media. But one of the most important media events of the year 1999 was, no doubt, the emergence of an important media character: José Bové. In a context of commercial tensions with the United States and WTO negotiations, he served to establish a strong and durable link between GMOs and globalisation; and came to incarnate French resistance against American imperialism. By the end of 1999, GMOs were definitely incorporated in the fight against globalisation and "Malbouffe", its manifestation. It became a symbol of the evils of globalisation and José Bové, along with the Confédération paysanne, were beginning to be presented in the media as defenders of French cultural and agricultural specificities on both the national and the international scene.

European and International Issues

Early in 1999, Le Monde published a series of articles on the international negotiations in Cartagena and the Biosafety protocol. It was the occasion to report on other countries' positions on the issue. It was put in evidence that countries were split into two groups: a group led by the United States and defending the interests of multinationals and a group of developing countries, led by Ethiopia and defending the precautionary principle: *« Le débat oppose les États-Unis et les grandes entreprises, qui veulent libéraliser le commerce des OGM, aux pays pauvres et aux écologistes, qui défendent le « principe de précaution ».* [64]

But it was also reported that Europe was on a middle ground. It was itself experiencing dissent between the Parliament and the Commission. Member States did

[64] Herve Kempf, « Le commerce mondial des OGM échappe à une réglementation internationale, » Le Monde, 26 février 1999.

not all agree on the commercialisation of GMOs and the Parliament was decidedly going against the Commission that was defending a more liberal approach.

In Europe, discussions for the renewal of Directive 90/220 had started a year before. The Parliament wanted stricter rules for commercial authorisation of GMOs including: the consultation of a European scientific committee before each approval; complete civil responsibility of those introducing the GMOs for any health or environmental damage; traceability and the prevalence of the precautionary principle.[65] With the Cartagena negotiations, it became obvious that these disputes were impeding Europe's capacity to efficiently take positions on the international scene.

> *« La Commission de Bruxelles n'aura pas la tâche facile à Carthagène. Non seulement les États membres de l'Union européenne sont divisés sur la mise sur le marché des OGM, mais en outre le Parlement européen a pris une position qui peut hypothéquer le projet de directive de l'exécutif communautaire, largement fondé sur la libéralisation des échanges commerciaux. »*[66]

The faces of risks

In 1999, the press also began to put a face on a variety of risks that had remained, until then, rather theoretical. In France, risks were beginning to be portrayed concretely with newspapers reporting on the possible dangers of BT corn for Monarch butterflies[67] or on the controversial findings of Arpad Putzay about the toxicity of GM potatoes on rats[68]. Furthermore, the US born "Terminator" technology of seed sterilization illustrated with great eloquence the risks to see farmers around the world become increasingly dependent upon multinational firms: *"... une poignée de multinationales s'apprêtent à se partager les droits de propriété intellectuelle des quelques dizaines de plantes qui, demain, fourniront peut-être l'essentiel de l'alimentation mondiale. Pour garantir ces droits, l'arme biologique la plus efficace jamais conçue a vu le jour l'an dernier aux*

[65] « Le parlement européen renforce la directive sur les OGM, » Le Monde, 13 février 1999.

[66] Marcel Scotto, « L'avenir du commerce des produits génétiquement modifiés se joue à Carthagène - Des désaccords croissants au sein de l'Union européenne, » Le Monde, 17 février 1999.

[67] Hervé Morin, « Les doutes s'accumulent sur l'innocuité du maïs transgénique, » Le Monde, 26 mai 1999; « Les dangers du maïs transgénique, » Le Monde, 26 mai 1999.

[68] Hervé Kempf, « L'opinion britannique se détourne des OGM, » Le Monde, 26 mai 1999; Jean-Yves Nau, « 'The Lancet' part en guerre contre les OGM, » Le Monde, 29 mai 1999.

États-Unis: un procédé de stérilisation des semences, baptisé « Terminator » par ses opposants. » [69]

Finally, comforting readers even more with the idea that GMOs represented risks for human health, some companies and store chains announced that they would not sell or use GMOs.[70] It was reported that some were starting to organise the separation of GM and non-GM soy to offer French consumers GMO-free eggs and poultry. *« Deux groupes français, Glon-Sanders, numéro un de l'alimentation animale, et Bourgoin, leader européen de la volaille, lancent la première filière « non OGM ». (...) Dès cet automne, deux mille agriculteurs vont récolter du « soja de pays ».* [71]

Legitimacy of field trials

In 1999, opponents started to attack the legitimacy of field trials of GM plant varieties. In 1998, the authorisation to grow BT corn had been suspended by the Conseil d'État pending a decision of the European Court of Justice and France had refused to allow GM soy and GM canola on its territory. Accordingly, no GM plant was, at the time, allowed to be grown commercially in this country. The only GM crops in France were experimental and it seemed that even these could not be tolerated by opponents. That France was the country in Europe with the most open field trials and a total of 1400 hectares of Bt corn sown in 1999; and that the government was reluctant to make public the location of these experimental parcels was, for some, reason enough to protest.

In March, newspapers reported that Friends of the Earth and France Nature Environment were unable to document the location of field trials in France. The DGAL and the CGB were refusing to give the information directly to them. Furthermore, the information, which was supposed to be posted at town halls, was reportedly most of the time non-existent. These associations did not hesitate to blame the government for what they called a lack of transparency and a deficit of democracy. The irregularities found by Friends of the Earth were said to be only the tip of the iceberg[72]: *"Un premier état des lieux des cultures à base d'organismes génétiquement modifiés (OGM) et expérimentées sur le territoire devait être rendu public, mercredi 3 mars, par Les Amis de la terre et France nature environnement. L'enquête permet de dessiner une première carte de*

[69] Catherine Vincent, « La stérilisation végétale, nouvelle arme biotechnologique,» Le Monde, 12 mars 1999. The « terminator » technolgy was the object of a series of article in Le Monde, 1999.

[70] Laure Belot et Pascal Galinier, « La grande distribution attise le débat sur les aliments transgéniques, » Le Monde, 7 mai 1999; « NESTLÉ - suppression des OGM**, »** Le Monde, 30 avril 1999.

[71] «OGM - la résistance s'organise, » Le Monde, 2 septembre 1999.

[72] Sylvia Zappi, « Des associations dénoncent le secret entourant les cultures d'OGM, » Le Monde, 4 mars 1999.

France des cultures d'OGM, mais elle révèle surtout de multiples infractions à la législation et une opacité croissante sur ce dossier. »[73]

In June, a group of French and Indian farmers destroyed parcels of experimental rice at the Montpelier CIRAD.[74] Their message was clear: multinationals wanting to create a dependency on their new products and claiming ownership of life - "appropriation du vivant" - should be opposed. This was the start of a war of words between scientists and activists that was conducted through the pages of newspapers.

A few weeks after the destruction of the rice experiments, a letter signed by over 300 scientists was published in Le Monde to protest against this act of vandalism. Scientists did not understand the reason for this attack against what was in their view a legitimate and useful scientific project whose goal was to gather data on the environmental impact of GMOs. Their letter was soon answered by the leader of *OGM danger* who questioned the legitimacy and transparency of these trials, done with public money, and with the goal to test products that private firms were trying to put on the market.[75] Answers given by scientists did not convince opponents to stop destroying experimental parcels. On July 3rd, a group of activists destroyed transgenic oilseeds fields grown to test their propensity to disseminate in the environment.

But scientists answered back that there was indeed a societal demand for this type of research. The goal to reduce dependency of regulatory authorities on private sources of data was legitimate.[76] If there was a demand, activists replied, it was political, not social. Authorities were simply trying to gather data to reassure consumers and citizens.[77] Destructions of experimental crops, they argued, were simply forcing scientists to reflect on the implications of their work.[78] Through these actions, opponents had successfully delivered the message that scientists might now be the ones creating risks and that their research, using public money, lacked legitimacy because it did not target so-called "real" public concerns.

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[73] « La France des OGM, » Le Monde, 4 mars 1999.

[74] Jean-Paul Besset, « Indiens et Ariégeois contre les OGM – 'Nous très fâchés, nous tout faucher'. » Le Monde, 5 juin 1999.

[75] « 300 chercheurs d'établissements publics s'interrogent devant la remise en question de leurs travaux, » Le Monde, 23 juin 1999. « Lettre ouverte aux citoyens, par 337 chercheurs, » Libération, 23 juin 1999. Dominique Leglu, « L'incompréhension des scientifiques. » Libération, 24 juin 1999. « Une réponse à la lettre ouverte de 337 scientifiques inquiets. » Libération, 25 juin 1999.

[76] « C'est le rôle de la recherche publique d'apporter des données expérimentales pour une biovigilance efficace. » Libération, 8 juillet 1999.

[77] Frederic Pratt et Thierry Raffin, « Faut-il cultiver des organismes génétiquement modifiés? » Libération, 3 septembre 1999, p.4.

[78] Corinne Manoury, « Le colza de la discorde, » Le Monde, 7 juillet 1999.

The "Bové" effect

It is hard to say who, between scientists and activists, affected readers' opinions the most favourably. However, commercial sanctions imposed by the United States on European food products in reaction to the banning of beef grown with the help of synthetic bovine growth hormone[79] served to step up opposition against GMOs. In May, *Libération* reported on the multiplication of commercial conflicts between the United States and Europe.[80]

It was then that José Bové emerged as a central media figure. This farmer from the Larzac region and co-founder of the Confédération paysanne had considerable experience as a militant. Bové, a ewe milk producer used in the making of Roquefort cheese, was directly touched by the commercial sanctions that were to increase by 100% the cost of Roquefort for US consumers. Bové had been involved previously in the destruction of GM seeds in Agen, in 1998, but it was in August of 1999, that the media started to pay a lot of attention to him, when he lea an action against a McDonald's restaurant in the city of Millau.[81]

From this day on, Bové became a central figure in the media. In the second half of 1999, 47 articles in Libération and 59 in Le Monde had José Bové mentioned either in their title or first paragraph. Both dailies published portraits of Bové.[82] He was even called the "Robin Hood of the Larzac".[83] He remained very present in the newspapers in the following years as table 3 shows.

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[79] Commonly called "*boeuf aux hormones*" in France.

[80] « Le Bœuf ranime les braises de la banane, » Libération, 13 mai 1999.

[81] « Les fabricants du roquefort se paient un McDo,» Libération, 13 août 1999. Jean-Paul Besset, « Quatre militants de la Confédération paysanne incarcérés après le sac du McDonald de Millau, » Le Monde, 20 août 1999.

[82] Jean-Paul Besset, « José Bové, un opposant radical aux « multinationales de la sale bouffe,» Le Monde, 23 août 1999. « José Bové, récidiviste de la mise à sac, » Libération, 23 août 1999. « José Bové, 46 ans, éleveur de brebis dans le Larzac, mène tambour battant la jacquerie contre la mondialisation, » Libération, 17 septembre 1999.

[83] Jean-Paul Besset, « Le Robin des bois du Larzac se livre à la justice, » Le Monde, 21 août 1999. Gérard Desportes, « Le pourfendeur de la sale bouffe,» Libération, 3 septembre 1999.

*Table 9. Number of articles in Le Monde and Libération having "Bové" in their title or first paragraph from 1998 to 2002 inclusively**

	Libération	Le Monde
1998	0	3
1999	47	59
2000	62	72
2001	45	59
2002	56	69

**Retrieved from in Factiva, keyword "Bové" limited to the title and the first paragraph.*

More than ever, Bové and the Confédération paysanne were trying to bring the debate into the judicial arena. With the Millau trial that followed the destruction of the McDonald's restaurant, the battle against globalisation began to be staged. On the one side, there was Bové, the defender of the specificity and cultural treasure of French agriculture and food and on the other were the interests of multinationals and "immondialisation" represented by the state prosecutor. The trial portrayed a proud José Bové, a victim and hostage of the free market against the forces of globalisation. They wanted to make American fast-food a symbol of economic globalisation that was disregarding people's rights, health and democracy. [84] The trial against José Bové quickly became the people's trial against globalisation. In doing this, the press helped to greatly polarize the issue. It was no more a situation where opponents were debating the goods or bads, or the risks and benefits of a technology; now the Confederation paysanne sought to frame the issue as the battle of French agricultural specificity against the evils of globalisation: *« La Confédération paysanne estime, pour sa part, que « l'action de Millau est le prélude au procès de la mal-bouffe et de l'agro-industrie sans scrupule ». Selon son porte-parole national, François Dufour, 'le procès des cinq syndicalistes sera celui de la mondialisation'. »*[85]

Given his previous sentence for destroying transgenic corn seeds in 1998, Bové's case was dealt with differently than his accomplices and he was kept in prison while awaiting his trial. The left, along with some farmers associations, very soon expressed their support for Bové, asking for his release and multiplying public protests against globalisation and "malbouffe".[86] The trial was also the occasion for international

[84]Gilbert Laval, « Le briseur de McDo reste au frais, » Libération, 1 septembre 1999.

[85] Jean-Paul Besset, « Quatre militants de la Confédération paysanne incarcérés après le sac du McDonald's de Millau, » Le Monde, 20 août 1999.

[86] Caroline Monnot, « La gauche 'mouvementiste' soutient la Confédération paysanne, » Le Monde, 23 août 1999; « Agriculture - manifestations et soutiens pour José Bové,» Le Monde, 25 août 1999; « Les opérations de soutien à José Bové se multiplient dans le monde agricole, » Le Monde, 30 août 1999; Forcari Christophe, « Toute l'extrême gauche derrière la Confédération paysanne, » Libération, 24 août 1999; Gilbert Laval, « Mobilisation pour la libération de José Bové, » Libération, 30 août 1999;

organisations such as Greenpeace or the Global Trade Watch Public Citizen of Washington to express their support for the cause. In so doing, they also contributed to increase the credibility of the Confédération paysanne.

In France, where union demonstrations can often take a rather « physical turn » , the imposition of bail for the release of Bové before his trial was perceived as a hardening of public authorities toward the union movement and portrayed as an act against the freedom of association. The *Syndicat de la magistrature (SM) et du Syndicat des avocats de France (SAF*) publicly shared this opinion. Bové managed to feed the controversy and embarrassed the government some more when he refused to be released on bail after receiving his sentence. Bové knew he would attract more media attention behind bars: *« Comment faire sortir au plus vite José Bové de sa prison? Telle est la question politique qui se pose désormais au gouvernement, et dont la réponse n'est pas évidente. Elle l'est d'autant moins que la justice est désormais réputée plus indépendante que naguère et que le leader aveyronnais de la Confédération paysanne ne paraît pas disposé à faciliter la tâche de Jospin et des ministres concernés, qui ne lui ont pourtant pas mégoté leur sympathie.»*[87]

At this point, Bové had already started to attract the attention of American media and his actions were followed closely by the Prime Minister and the President. Farmer organizations around the world were collecting money to pay his bail. [88] In France, he was becoming a source of pride: a typical and ordinary Frenchman was attracting the attention of the world and, in particular, the media in the USA: *« Robin des Bois du Larzac, Zorro du Causse aveyronnais, sous-commandant Marcos de la cause rurale. Les formules fleurissent, la légende enfle et passe les océans. On parle de lui dans les gazettes new-yorkaises, son nom est cité à l'Organisation mondiale du commerce à Genève. Jusqu'à Matignon, où son cas aura été suivi de près par les services de Jospin. »*[89]

When Bové finally agreed to get out of jail, he continued to make alliances to fight globalisation and its manifestation, "Malbouffe".[90] In just a few weeks, the Confédération paysanne had become more present in the media than the very well known and still leading representative organization for French farmers, the *Fédération nationale*

Alexandre Garcia, « L'inquiétude croissante du monde paysan sur son avenir, » Le Monde, 1 septembre 1999.

[87] Jacques Amalri,. «Patate chaude, » Libération, 3 septembre 1999.

[88] Gilbert Laval et Hervé Nathan, « Haro des syndicats sur la caution, » Libération, 7 septembre 1999.

[89] Gérard Desportes, « Le pourfendeur de la sale bouffe, » Libération, 3 septembre 1999.

[90] «Les nouvelles frontières des paysans, » Le Monde, 9 septembre 1999; Christophe Forcari, « La gauche de la gauche sacre le croisé anti-McDo, » Libération, 25 septembre 1999.

des syndicats d'exploitants agricoles (FNSEA). The credibility of the CP had been increased by the world wide support from NGOs and by huge media attention. Bové was on every tribune. He was beginning to personify the fight against the WTO and the evils of globalisation. Even the Minister of Agriculture was reported to call him from time to time: *« En cinq semaines, la campagne contre la mondialisation qui a pris le visage de la mal-bouffe, et la décision de Bové de rester en prison pour ne pas payer la caution qu'exigeait la justice, ont changé la donne. José Bové est sur toutes les télés et même le ministre de l'Agriculture, Jean Glavany, lui téléphone. »*[91] Ultimatly, these events served to launch ideas promoted by the Confédération paysanne which became a symbol of resistance against the forces of globalisation. It ultimately brought together NGOs and citizens from across France around the goal to fight a certain form of globalisation which included GMOs.

Seattle or the «Astérix de la Roquefort libération » against the "Frankenfood" invasion.

Bové was becoming the face of the battle against globalisation. Invited by Friends of the Earth, he went to Washington first and then to Seattle to demonstrate against GMOs.[92] With his picturesque physical appearance, he once more succeeded in attracting the attention of American media. According to reports of the French press, during the WTO meeting, he also succeeded in uniting a variety of opinions and of protest movements around a few simple but evocative concepts: immondialisation, malbouffe, and frankenfoods.

> *« S'il restera une image de la réunion de l'OMC à Seattle, ce sera celle de José Bové dans son rôle d'irréductible Gaulois, debout sur une camionnette, haranguant quelques centaines de manifestants devant un McDonald's fermé dont la vitrine vient d'être enfoncée. »(…) « Il faut dire que les médias américains (et français) sont en passe d'en faire un héros planétaire, en lui consacrant autant d'importance qu'à Mike Moore, le directeur général de l'OMC. »* [93]

Libération reported that Bové was presented by Times Magazine as a French version of Lech Walesa. Bové was becoming a hero of international proportion and above all, in the people's mind and in media descriptions, he was replacing national authorities in the defence of French specificity against global invasion of American

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[91] Gilbert Laval et Muriel Gremillet, « Le nouveau chant des paysans, » Libération, 13 septembre 1999.

[92] Their slogan was «Frankenfoods, no thanks."

[93] Patrick Sabatier, « La carte postale de Seattle,» Libération, 1 décembre 1999.

products and the very powerful biotechnology industry. In Seattle, he succeeded in condensing the entire problematic of globalisation into a few key concepts. In a few months, Bové had become a symbol of the French resistance and had provided common ground for collective identification to the cause.

With the Montreal conference on the Cartagena Protocol, the international scene continued to be important in 2000. Officially, it was the group of Miami composed of Canada, Argentina, Uruguay, Australia and Chile that opposed Europe. But reports on the Montreal conference portrayed a situation where the USA, which had not even ratified the 1993 Convention on Biodiversity, the host organization for the Protocol, was trying to lead the negotiations. The context of the Montreal conference was described in Le Monde as Europe vs. the USA in a battle of free trade against precaution and socio-economic variables.[94] For Libération, it was the Unites States against the rest of the world.[95]

An agreement was finally reached: imports could be blocked for precautionary reasons but precaution was not precisely defined; and labelling was limited to the obligation of the exporting country to mention that a load "may" contain GMOs. The judicial value of the protocol was however unclear; it was unsure which of the WTO accords or the Biosafety protocol would have precedence in the case of a commercial dispute. In the newspapers, the agreement was however presented as a victory for Europe.

In 2000, José Bové continued to be an important media figure both nationally and internationally. He was invited to participate at the Davos World Economic Forum that gathered world political and corporate leaders but preferred to stay outside with protestors. Bové and the Confédération paysanne did not want to be associated and give credibility to an event where many developing countries and NGOs were not invited as participants. At this point, Bové and Confédération paysanne were indeed in a position to add credibility to any event they chose to attend and participate.[96] In the case of Davos, the strategy was again to undermine the legitimacy of the meeting and expose its democratic deficit.

> *« Davos n'est pas Seattle. Il ne s'agit pas d'une réunion de ministres pour prendre des décisions sur le commerce mondial, mais d'un forum privé qui prétend être au cœur du débat sur l'avenir du monde. (…). Le problème, c'est qu'il*

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[94] Herve Kempf, « Le libre commerce des OGM est l'enjeu de la conférence de Montréal.,» Le Monde, 26 janvier 2000.

[95] Patrick Sabatier. « Bras de fer mondial sur les OGM, » Libération, 25 janvier 2000.

[96] Interventions of Bové in Seattle had left a rather favourable impression in the media. Libération even referred to him as the Seattle hero (4 mars 2000, Libération).

> *y a deux forums. L'un est public. L'autre est non-officiel, voire secret, et il abrite tous les contacts et les discussions qui ont lieu en coulisses entre les multinationales et les chefs d'État et de gouvernement. Discussions qui portent non seulement sur des contrats, mais aussi sur des politiques à suivre.»*[97]

Bové's intervention at the Davos forum reinforced the perceived polarisation between ordinary people and decision-makers, exposing their lack of transparency and alleged collusion with multinationals.

On the national scene, the press reported that Bové was invited to meet with President Chirac and later with Prime Minister Jospin.[98] It is hard to say who benefited more from the meetings, Bové or the politicians. Bové was the person to meet to show the public that the state and the government were "listening". But Bové was systematically stealing the show and these meetings showed that he had become a "must" on the French political scene.[99] Some political leaders were trying to associate their message with that of Bové.[100] There were even rumours that he would be a candidate at the next presidential election. In June, Libération reported that José Bové was nominated a « star activist » by *Business week*. [101]

Renewal of the European directive 90/220, labelling and experimental releases

In April, the European Parliament voted in favour of a new directive to replace 90/220. The decision of the European Parliament to allow GMOs under stricter controls was welcomed with relief by the industry and as treason by opponents. Yet, the new directive was to receive the approval of the mixed Committee of the Parliament and of the Council of Ministries. According to Le Monde, the new directive set more precise rules for evaluation, public consultation, public information on location of transgenic cultures and a system of environmental monitoring. Authorisations were to be limited to ten years with the possibility to be retrieved if new scientific evidence was to justify it.

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[97] José Bové quoted in Pascale Riche, « Cofondateur de la Confédération paysanne. Non officiel à Davos. José Bové,» Libération, 29 janvier 2000.

[98]« Chirac-Bové, discussion de Salon, » Libération, 28 février 2000; « Jospin-Bové - dîner et tutoiement. Souvenirs du Larzac, bilan de Seattle Opération séduction, » Libération, 18 mars 2000; « Lionel Jospin a convié José Bové à dîner, » Le Monde, 20 mars 2000.

[99] Pierre Georges, « Les pierres de la cohabitation, » Le Monde, 29 février 2000.

[100] Charles Pasqua, président of Rassemblement pour la France and previously minister of the Interior, was reported saying : « On ne remerciera jamais assez M. Bové d'avoir fait capoter tout ça. Mais surtout, apprêtez-vous à recommencer.» in Jean-Louis Saux, « Charles Pasqua juge « légitime » le combat de José Bové, » Le Monde, 22 juin 2000.

[101] « Business Week élit les 50 stars de l'Europe, » Libération, 6 juin 2000.

Finally, the new directive included provisions for the labelling of GM products at every stage. The provision holding producers liable in case of environmental damages was however rejected; and GMOS with a gene of resistance to antibiotics were allowed to be grown until 2005.[102]

In Canada, such a decision would, no doubt and for the most part, have had opponents to GMOs do a dance of joy in the streets of Ottawa. In France, opponents were not satisfied because it meant that GMOs would finally get to be grown in France. The new directive meant that the informal moratorium was over. In the press, the news was presented as a loss for the ecologists and a victory for the industry.

> *« Les eurodéputés ont adopté, mercredi 12 avril, une nouvelle directive qui autorisera la production d'organismes génétiquement modifiés tout en renforçant les contrôles. Les industriels se félicitent. Les écologistes regrettent le rejet d'un amendement engageant la responsabilité des producteurs. »*

In Liberation, it was presented as the end of Europe's barriers against environmental release of GMOs.[103] The French Minister of the Environment and leader of the Green party, Dominique Voynet, reinforced this attitude towards the new directive by implying that France was not satisfied and that this new directive was not completely protecting consumers and the environment: *« Dans un communiqué publié jeudi, elle affirme que « la France mettra toute son énergie pour obtenir une directive qui protège complètement la santé des consommateurs et l'environnement ». La ministre « déplore que le Parlement européen, dominé par une majorité conservatrice, n'ait pas saisi l'opportunité de renforcer » le dispositif de précautions autour des OGM. »*[104]

Almost simultaneously, Le Monde reported that protesters had just destroyed another experimental parcel and that the French government was still refusing to release the information about the location of experimental parcels grown with GMOs.

> *« Car malgré la transparence célébrée par le ministre de l'agriculture Jean Glavany (Le Monde du 4 octobre 1999), malgré une loi spécifiant le droit du public à l'information sur les organismes génétiquement modifiés (OGM), malgré de nombreux avis favorables de la Commission d'accès aux documents administratifs (CADA), les citoyens se voient refuser l'accès aux « fiches*

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[102] Herve Kempf et Rafaele Rivais, « Le Parlement européen rouvre la voie à la culture, » Le Monde, 14 avril 2000.

[103] Nicole Gauthier, « Barrières minimales autour des OGM,» Libération, 13 avril 2000.

[104] Francois Grosrichard et Beatrice Gurrey, « Dominique Voynet assure que la France restera ferme sur le contrôle des OGM, » Le Monde, 15 avril 2000.

> *d'information du public » décrivant les essais d'OGM qui se déroulent en France. L'administration bloque cette information depuis plus d'un an et, le 13 avril, la CADA devrait rendre un nouvel avis favorable à une demande de communication, cette fois de l'association France Nature Environnement. »*[105]

For *Le Monde*, this confrontation was opposing two legitimacies: one based on the massive rejection of GMOs by public opinion and farmers, and the second, the legitimacy of the European Union, a democratic structure that was then in the process of being built and that tended to choose compromise between public opinion and commercial interests.[106]

Genetic contamination

At the end of May 2000, the public was informed that some GM oilseeds had been accidentally mixed with conventional varieties and had been accidentally sown on 6oo hectares in France. Genetic pollution and illegal GM seeds were soon a media focus. [107] From the end of May 2000 until the end of the year, 22 articles in Libération and 28 in Le Monde had as their subject cases of accidental contamination with transgenic seeds or crops.

The French government was caught guilty of withholding information. They had been informed on April 3rd and released the information more than a month later, on May 18th. This secrecy, argued Le Monde, was one more proof that, when it came to transparency, the government was all talk, even though consumers wanted to know what they were eating. Once more, the coalition government was the scene of dissension. While Dominique Voynet asked for the immediate destruction of the parcels, the Minister of Agriculture declared the problem had been exaggerated. [108]

According to Le Monde, these illegal plantings of oilseeds set back the debate on GMOs and highlighted a judicial weakness: there was no limit as to the quantity of GM seed that can be incorporated with conventional seeds and there was no systematic control of this variable. Regulations on GM seeds were supposed to be ready in the fall of 2000.

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[105] Herve Kempf, « Le Parlement européen rouvre la voie à la culture d'OGM - La France dissimule les informations sur les cultures transgéniques, » Le Monde, 14 avril 2000.

[106] « OGM - pour un débat franc, » éditorial, Le Monde, 15 avril 2000.

[107] Herve Kempf, « La découverte fortuite d'OGM relance le débat sur leur contrôle en Europe - Les semences d'Advanta face à un vide juridique, » Le Monde, 22 mai 2000.

[108] Benoit Hopquin, « La découverte fortuite d'OGM relance le débat sur leur contrôle en Europe - La France prise en flagrant délit de manque de transparence total, » Le Monde, 22 mai 2000.

The EU was once more in a situation where GMOs were introduced faster than they could implement regulation. [109] A few days later, under public pressure, the government ordered the destruction of the parcels accidentally contaminated with transgenic rapeseed. That the decision was made public by the Prime Minister's office and was the result of tough negotiations between the ministries of Agriculture, Environment and Consumers show how serious the issue was in France.[110] But it was not the end of it. A month later, Libération reported on an increase of cases of accidental contamination of GM seeds. Another case attracted attention of the newspapers. This time it was GM corn seeds that had been accidentally mixed (with levels less than 1%) with non-GM varieties.

> *« Les cas de contaminations accidentelles de cultures par les OGM augmentent. Hier, la Direction générale de la consommation, de la concurrence et de la répression des fraudes a confirmé l'information publiée par le journal Sud-Ouest dans son édition d'hier: 4800 hectares auraient été ensemencés avec du maïs contenant moins de 1% d'OGM «dans vingt-trois départements français et dans la quasi-totalité de ceux du sud-ouest de la France, région dans laquelle le maïs est très largement cultivé». »*[111]

José Bové asked for its destruction but the problem was different since GM corn was already authorised in France since 1997. This situation put the government in a much more difficult position.[112] The Association générale des producteurs de maïs (AGPM) protested and threatened to sue the government for any loss that could occur from the destruction of these crops. Dominique Voynet was in favor of the destruction but the government went against her opinion and decided to leave the crops as they were.[113]

This decision was difficult to understand and fed critics against the authorities. Libération presented the decision as a case of incoherence. *"En matière de lutte contre les OGM, le gouvernement fait deux grains, deux mesures."* The government was accused of taking the side of American seed industries and of being their accomplices

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[109] Herve Kempf, « La découverte fortuite d'OGM relance le débat sur leur contrôle en Europe - Les semences d'Advanta face à un vide juridique, » Le Monde, 22 mai 2000.

[110] Catherine Coroller, « Matignon décide d'arracher les 600 hectares pollués. Le colza transgénique ne poussera pas, » Libération, 26 mai 2000.

[111] Catherine Coroller, « Multiplication du maïs transgénique, » Libération, 22 juin 2000.

[112] Catherine Coroller, « Arrachage des OGM - toujours pas de décision, » Libération, 7 juillet 2000.

[113] « OGM - Dominique Voynet est pour l'arrachage des maïs, » Libération, 13 juillet 2000.

while French farmers had been abused about the quality of non-GM seeds.[114] In August, the government ordered that a small parcel of soy contaminated with GM varieties be pulled out and destroyed. But reports gave the impression that the Confédération paysanne and José Bové were the ones calling the shots:

> *« Trois hectares de soja transgénique ont commencé à être détruits samedi matin dans une ferme de Charleval sur ordre du gouvernement et sous le contrôle de la Confédération paysanne. (…) La destruction de 46 hectares dans le sud-est de la France a été décidée le 7 août par le gouvernement à la demande des associations écologistes et de la Confédération paysanne. Les agriculteurs toucheront des indemnités jugées équitables par les exploitants concernés et par le syndicat de José Bové.*[115]

The Millau trial

In June, José Bové and his friends had to attend their trial for the destruction, a year before, of a McDonald restaurant in Millau. The Confederation Paysanne had decided to make it another anti-globalisation event, much like what had happened in Seattle. They succeeded in many ways. According to the organizing committee, 20 000 supporters from all over France and Europe were expected. Media outlets from around the world were also expected to cover the story, including the well-known CNN. [116] Discussion forums, debates, and even concerts, were planned. During 5 days, French media covered and analysed the event.

> *« La Confédération paysanne veut faire de ce rendez-vous une grande fête contre «la mondialisation libérale», avec forums et concert dans la ville. » (…) « Des débats sur la mondialisation seront organisés (…). Cinq forums y seront animés par la Confédération paysanne, Greenpeace, le groupe Attac ou le sociologue Pierre Bourdieu. Le soir, Zebda et Francis Cabrel donneront un concert de soutien sur l'esplanade de la Maladrerie. Samedi après-midi, José Bové y tiendra un meeting de clôture avec les témoins du procès et le président de la Ligue des droits de l'homme. Pendant cinq jours, Libération propose une radiographie du mouvement Bové et de ses résonances. »*[117]

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[114] Matthieu Écoiffier, « Le Sud-Ouest laisse pousser son maïs contaminé, » Libération, 17 juillet 2000.

[115] « Le début de la fin pour le soja transgénique français,» Libération, 28 août 2000.

[116] Gilbert Laval, « Millau bouillonne avant son Seattle, » Libération, 20 juin 2000; Patrick Sabatier, « Réveil citoyen, » Libération, 30 juin 2000.

[117] Gilbert Laval, «Le procès de José Bové à Millau, » Libération, 26 juin 2000.

The arrival of Bové at the court of justice was theatrical: he arrived in a cart full of hay, hands tied as though he was already condemned and ready for execution. Just like a year before, justice was about to serve his cause:

> *"A chaque étape, la justice va servir la cause de la Confédération: maintien de José Bové en prison, demande de caution et, surtout, ces deux photographes qui parviennent à se faufiler dans le palais de justice de Millau. José Bové les aperçoit, lève vers les objectifs ses poings menottés, l'oeil rigolard. Le cliché fera la une des quotidiens. «On a utilisé les fautes de l'adversaire. On a fait de l'aïkido syndical», reconnaît Bové.»*[118]

State prosecutors were walking on thin ice. They had to deal with the huge mobilisation around Bové and they had to ask for the law to be respected. Bové and his companions were arguing the opposite: the legitimacy of actions is evident when laws and regulations go against citizens' interests for the benefit of a few.

> *« Le ministère public a marché sur des œufs tout au long de l'audience: il n'était pas simple de prendre en compte la mobilisation autour de José Bové et d'exiger dans le même temps que la loi soit respectée en toute circonstance. «Tout le monde semble approuver cette action de l'été dernier contre le McDonald's», a ainsi noté le procureur. Mais la légitimité, expliquait-il encore, ne vaut pas légalité. »*[119]

The government responded to public fears by announcing that a series of public forums would take place. Organised by the Secretariat of state for commerce and consumption, these forums would be presided by members of the Conseil national de la consommation (CNC). Le Monde reported that the government was, at last, ready to ask for public opinion and ready to publicly discuss risks and benefits of GMOS.[120] These forums however got very little press coverage, just like the Aubert report and negotiations for the renewal of the 90/220 directive. In 2000, French newspapers were more than ever focussing on activism.

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[118] Eric Aeschimann, « Il était une fois nommé Bové, » Libération, 30 juin 2000.

[119] Gilbert Laval, « La justice passe après le sacre de Bové, » Libération, 3 juillet 2000.

[120] Benoit Hopquin, « Le gouvernement lance un « débat citoyen » sur les OGM, » Le Monde, 8 juillet 2000. « Enfants cachés de la science, les organismes génétiquement modifiés étaient jusque-là semés en catimini. Ils s'immisçaient subrepticement dans la vie quotidienne des Français, profitant d'une inextricable législation. »

Decision of the Conseil d'État

Another controversy was reported in the press before the end of 2000. In November, the Conseil d'État confirmed the authorisation of 3 varieties of Novartis BT transgenic corn to be grown in France. [121] This decision was based on a decision of the European court of justice indicating that the French government was not legitimate to interdict GM BT corn.[122] Once more, the coalition government was in a difficult position with Dominique Voynet and angry ecologists publicly asking to ban these crops.[123] This story attracted little media attention but was enough to keep opponents on guard.

The Bové trial

Year 2001 was fertile with unexpected developments. It started with the trial of José Bové and his companions for destroying CIRAD experimental rice parcels a year before. Once again, the accused of the Confédération paysanne succeeded in transforming their trial into a popular and media trial. This time, it was the legitimacy of public research conducting open field essays that was indirectly going to be tried. National newspapers reported on huge gatherings at the occasion of the trial, a "Kermesse contre « l'immondialisation »" according to Libération.[124] Just like in Millau a year before, militants from ecologist movements and anti-globalization organisations came together in support of the Confédération paysanne and of the accused. The fight was against globalisation, transnational societies, "malbouffe", GMOs and against what was perceived as repression against union leaders. [125]

During the trial, it was reported that, out of a total of 13 hours of deliberation, only one hour was used to expose the facts of the destructions that happened at the CIRAD.[126] The main debate was on the legitimacy of public research. Were these research projects on GMOs in the collective interest? Was it legitimate to spend public money to help private firms with their task to put GMOs on the market? It got to a point where, because of their testimonies, heads of the CIRAD were afraid of being associated

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[121] Benoit Hopquin et Beatrice Gurrey, « Le Conseil d'État autorise la commercialisation de trois variétés de maïs transgénique, » Le Monde, 24 novembre 2000; Catherine Coroller, « Feu vert au maïs transgénique, » Libération, 23 novembre 2000.

[122] Herve Kempf et Rafaele Rivais, « La Cour de justice européenne relance la bataille des plantes transgéniques, » Le Monde, 22 mars 2000.

[123] Paul Quinio, « Voynet piétine les futurs champs d'OGM, » Libération, 24 novembre 2000.

[124] Which can be translated as a "A public fair against malicious globalisation." In Catherine Bernard, « Bové sans gène face aux chercheurs,» Libération, 9 février 2001.

[125] Catherine Coroller, « En février, Bové abonné aux procès, » Libération, 8 février 2001.

[126] Hervé Kempf et Vincent Tardieu, « Le procès de José Bové se transforme en débat sur la recherche, » Le Monde, 10 février 2001.

with the giant biotechnology firms. Bové was accused and research was blamed.[127] It became the trial of the CIRAD and public research. It also exposed the extent of the dissent among members of the scientific community who did not all agree on the environmental risks of GMOs.[128] After receiving a sentence of 6 months in prison, Bové continued to attack the legitimacy of the authorities, this time by declaring that the magistrate was no doubt taking orders from economic interests.[129]

Field trials and genetic contamination

In March 2001, newspapers reported that the administrative tribunal had ordered the government to make public the information about the location of open field trials. The ministry of agriculture had lost its case against France Nature Environnement.[130] The list was only partially made available in the end of June. It omitted to mention the precise localities of the field trials.[131] Wanting to avoid more destruction of experiments, the government was still described as secretive. It was not until the end of July, when the Ministry of Agriculture was ordered to release the information for second time that it complied completely with the decision. In the mean time, opponents were still destroying every experimental parcel they could find.

Later that year, the Agence française de sécurité sanitaire des aliments (AFSSA) published a report that alarmed opponents all across France. Traces of GMOs had been found in 41 % of rapeseed, soy, and corn samples analysed by the AFSSA.[132] These findings, although only traces were detected, were treated in Le Monde as a proof that the control system was inefficient. Le Monde reported that conventional seeds were now colonized by GMOs and that GMOs were slowly invading France. These findings made all the precautions that were taken so far appear somewhat useless.

> *« Ce constat rend un peu dérisoires les précautions affichées, non seulement par Paris, mais par Bruxelles. La Commission européenne propose en effet une directive destinée à contrôler, sans interdire, la commercialisation des*

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[127] Catherine Coroller, « Bové accusé, la recherche incriminée, » Libération, 10 février 2001.

[128] Hervé Kempf, « José Bové comparaît devant le tribunal correctionnel de Montpellier pour destruction de riz transgénique, » Le Monde, 9 février 2001.

[129] Le Monde, 22 décembre 2001.

[130] Catherine Coroller, « La clé des champs d'OGM, » Libération, 2 mars 2001; « Le ministère de l'Agriculture condamné sur la transparence des essais OGM, » Le Monde, 3 mars 2001.

[131] « OGM- La liste des sites sur l'Internet, » Libération, 23 juin 2001; « La liste des expérimentations OGM de l'année 2001 vient d'être diffusée, » Le Monde, 23 juin 2001.

[132] « Les OGM gagnent du terrain en France, » Le Monde, 26 juillet 2001; Catherine Coroller, « 41% du maïs déjà touché, » Libération, 26 juillet 2001, p.12.

> *OGM. Réglementation, traçabilité, étiquetage, tout est prévu. Les Européens pourront décider. (…) Cela fait irrésistiblement penser à ce film de Buster Keaton où, pendant une tornade, il lutte pour refermer la porte d'une maison qui n'a plus ni toit ni fenêtres. »*[133]

Mayors of 23 villages of the region of Sarthe jumped on the occasion to announce their intention to ban GMOs on their territory. This movement was led by a group of 16 associations, Stop-OGM, which included Les Verts, France Nature Environnement (FNE) and the Confédération paysanne.[134] For its part, the government announced its intention to organise a workshop to elaborate a charter of transparency for GMOs open field trials. Consumer associations, experts, and government officials were invited to participate.[135]

Confédération paysanne was quick to take hold of the issue. Bové, whose words were reported in Le Monde, sent an ultimatum to the government: all experimental parcels should be destroyed before August 12 or he would encourage citizens to destroy these field trials themselves. In his view, since the collective good was threatened by private interests, citizens were well justified to take individual actions.[136] In the days that followed, the tension intensified. The workshop on the transparency of field trials was boycotted by Confédération paysanne, Greenpeace and Coordination rurale. For these associations, the charter was just a way to make GMOs more acceptable to the public whilst the real problem was that there seemed to be no way to control the spread of GMOs.[137]

> *« Le problème, c'est que le gouvernement refuse pour l'instant d'avouer son impuissance. Et continue à entretenir le mythe de filières sans OGM. Manifestement, il ne peut endiguer leur pénétration. Pour autant, le gouvernement continue de solliciter «l'opinion», «l'avis», «l'expression citoyenne» sur le sujet, à l'instar de ces débats, comme s'il voulait faire croire qu'il lui est encore possible de freiner le phénomène. »*[138]

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[133] « OGM pour tous, » éditorial, Le Monde, 26 juillet 2001.

[134] Regis Guyotat, « Les pouvoirs publics constatent la colonisation des cultures par les OGM - La croisade de vingt-trois communes de la Sarthe, » Le Monde, 26 juillet 2001.

[135] « Les pouvoirs publics constatent la colonisation des cultures par les OGM. - Le gouvernement veut une charte de transparence, » Le Monde, 26 juillet 2001.

[136] « José Bové appelle à la destruction des cultures d'essais OGM, » Le Monde, 28 juillet 2001.

[137] Gaelle Dupont, « La Confédération paysanne durcit ses actions contre les OGM, » Le Monde, 10 août 2001.

[138] Catherine Coroller, « OGM, les « cobayes » se rebiffent, » Libération, 11 août 2001, p.14.

After August 12, newspapers reported on systematic destructions of experimental parcels across France.[139] On August 23, Le Monde published a dossier on the new outbreak of GMO destruction titled "La Confédération paysanne ouvre sa champagne sur les OGM."[140]

The wind starting to turn?

At the end of August, the wind started to turn which created an opportunity for a more balanced debate. Some had already tried to attract attention to the risks for France of being left behind if all research on GMOs were to stop. But industries had, for a while, withdrawn from public debate. It seemed that nothing they could say could change public opinion because they were pictured as being the bad guys, those on the side of the Americans, trying to impose GMOs and globalisation on the people in France. But opponents were going too far. This new outbreak of destructions and the destruction of an experimental parcel grown for medical research on an enzyme that could provide a treatment against cystic fibrosis somewhat changed the dynamic in the media. Industrial firms and scientists started to speak out again. [141]

> *"Par leurs opérations illégales, (ils) sont parvenus à imposer un débat public qui balbutiait jusque-là, faute de protagonistes s'exprimant clairement sur les mérites des OGM. La colère devant le gâchis scientifique a fait sortir d'un silence qui confinait à la clandestinité ceux qui, depuis des années, œuvrent dans ce domaine. »*[142]

On August 25, le Monde published another dossier, this time about producers defending their right to research.[143] These destructions, they argued, will simply favour American companies and have, as a consequence, the disappearance of plant biotechnologies in France and Europe.

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[139] « Un champ d.OGM détruit dans la Drôme, » Libération, 14 août 2001, p.13; Julie Lasterade, « Pour les OGM, la grande faux est passée à Beaucaire. Des opposants ont arraché, hier, des plants de maïs, » Libération, 23 août 2001, p.11; « Croisade anti-maïs transgénique dans la Drôme. La moisson sauvage, » Libération, 27 août 2001, p. 1; Tonino Serafini, « Dans la Drôme, les OGM s'arrachent à la pelle, » Libération, 27 août 2001, p.2-3; Christian LOSSON. «L'obscurantisme est du côté du gouvernement.» Libération, 27 août, p.3. Alice Géraud. « 9 heures, le champ livré aux serpettes. Près de 150 militants ont détruit deux parcelles de maïs, » Libération, 27 août, p.3.

[140] « La bataille des OGM est relancée, » Le Monde, 23 août 2001.

[141] Véronique Lorelle et Jean-Baptiste de Montvalon, « Ogm – Glavany souhaite davantage de mesures de précaution, » Le Monde, 24 août 2001.

[142] Benoit Hopquin, « Contre José Bové, chercheurs et industriels sortent du silence, » Le Monde, 12 septembre 2001.

[143] « Le plaidoyer des industriels français pour le droit à la recherche, » Le Monde, 25 août 2001.

The government was also beginning to be blamed publicly for letting opponents destroy experimental field research: the police would usually be there only to make sure there was no violence between people, but never protected the parcels. Some important actors started to condemn anti-GMO actions. The Minister of Research, who had been rather absent in the media, declared that destructions were motivated by irrationality and obscurantism. Benefits of GMOs for agriculture and the environment should not be forgotten, he added.[144] The socialist party also expressed disapproval of these actions. Editorials were more nuanced and critical of those rejecting research: *« Il faut espérer que le gouvernement, qui n'a eu qu'une gestion réactive du problème jusqu'ici, ne cédera ni aux pressions d'une industrie agroalimentaire qui n'évalue les OGM qu'en termes de profits, ni aux imprécations de ceux pour qui «le seul bon OGM est un OGM arraché».* [145]

Early September, the government finally ordered the police to protect experimental parcels from being destroyed.[146] But the government would still not take a position on the issue. The cabinet was still divided. Repeated interministerial meetings did not find a solution. Elections were coming soon, in the spring of 2002, and the government did not wish to provoke public opinion so it did not seize the occasion to impose a decision. But it was important for France to maintain field research on its territory. Already, it was reported that the number of open field research sites in France had shrunk by about a half in only one year. The CGB was receiving significantly less demands from industrial companies mostly because of the absence of a market. Because of social pressures, it was getting increasingly difficult to recruit farmers to conduct field trials on their land.[147] The government was afraid that France would be left behind and lose important markets. It was also looking for a way to skirt around the difficulty of having to discuss with the *Confédération paysanne*. In November of 2001, the government announced that another public debate would take place in January 2002, this time to gather elements to help reach a decision on the question. [148]

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[144] Sylvestre Huet, "Face aux OGM, gare à l'irrationalisme,» Libération, 7 septembre 2001;

[145] Patrick Sabatier, « OGM Maîtrise, » Libération, 27 août 2001.

[146] Pierre-Henri Allain, « OGM – le gouvernement veille aux grains, » Libération, 3 septembre 2001; Pierre Cherruau et Alain Defaye, « Les forces de l'ordre ont empêché l'arrachage de plants d'OGM, » Le Monde, 4 septembre 2001.

[147] Julie Lasterade, « Des sites moins nombreux, plus ciblés. Les chercheurs souhaitent continuer les essais en pleins champs, » Libération, jeudi, 27 septembre 2001, sec. Société, p. 24.

[148] Catherine Coroller, « Matignon: que faire des OGM? » Libération, samedi, 24 novembre 2001, p. 14.

Press review - Canada from 1994 to 2001

From 1994 to 1998, up to 95% and no less than 70% of articles on biotechnology in La Presse and in the Globe and Mail focused primarily on medical innovations, new pharmaceutical and agri-food applications or were business news or reports on stock market. These data tend to confirm Stephen Strauss' observation: even if there was a general interest in the area among readers, biotechnology was at the time largely a business story. He found that, from 1977 to 1996, 2/3 of articles on biotechnology were in the business section.[149]

Nevertheless, before 1998, the total number of articles on the subject of biotechnology was rather moderate in both La Presse and The Globe and Mail. From less than a hundred articles per paper per year between 1993 and 1997, these papers started to publish close to 200 articles on the subject in 1999 and over 200 in 2000 and 2001. The total number of articles decreased significantly in 2002.

Some articles did question the way these products were regulated, their safety or their usefulness but these articles rarely made it to the front page. Between 1994 and 1998, biotechnology was seldom presented as a controversial issue and was eagerly supported by government officials and the industry. The introduction or imminence of introduction of a food application of biotechnology such as the Flvr Savr tomato, or the New leaf potato did trigger some questioning and discussions. Regulations in Canada and the work of parliamentary committees were sometimes also the object of an article but they never made much noise in the media. These reflexive articles were sporadic and greatly outnumbered by innovation and business-type of news. In Canada, the press echoed that biotechnologies were a source of pride for the government. For example, an advertising special was published in the Globe with at least 3 long articles describing and saluting Canada's accomplishments in research and business, and the commitment of the Canadian government toward the creation of Centers of excellence devoted to biotechnology.[150]

Bovine growth hormone did not get huge attention from the newspapers but it constituted the first real Canadian controversy about biotechnology. The audit by the Standing Committee on Agriculture and Environment, it seemed, attracted the attention of

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[149] Stephen Strauss, "Biotechnology and the Media," in Biotechnology and the Consumer, eds Knoppers and Mathios (Dordrecht: Kluwer Academic Publishers, 1998), 277-308.

[150] "Advertising special report," The Globe and Mail, May 24, 1994, sec. C.

the media to the imminent use of this hormone in Canadian milk production. Because some of the witnesses and the report itself were questioning the very capacity of the federal government to do proper evaluation of these new products, this report could have had an important impact on public perception of the regulatory system. Press coverage, however, was such that these aspects of the problem were covered either superficially or simply downplayed. Opposing voices concentrated mostly on risks issues, in this case on health risks. In the media, the Committee's audits were reported as being done to avoid public controversy; it did not mention the real reason which was to inquire about the way rBST had been evaluated so far.

In *La Presse*, only 6 articles dealt with this topic between February 1994 and July 1994. In *The Globe and Mail*, it was the object of 9 articles. Recombinant growth hormone however made headlines on February 14 "Milk hormone stirs up fuss" and October 23, 1994, with articles reporting on US demonstrators spilling milk from BST treated cows at an Ottawa conference of the United Nations.[151] Articles were often ended with questions related to the decision's impact to accept or not the product on the "young Canadian biotechnology industry". [152] Ralph Goodale, then minister of Agriculture, was reported to have publicly declared that, whatever might be decided about rbST, the government had to be careful not to harm the nascent biotechnology industry, a rapidly growing sector. Canada had to keep in mind, he added, that biotechnologies applied to agriculture held tremendous potential for the future.[153] Very little or nothing was said, much less explained, about the way these products were regulated. Roughly, one recommendation of the Standing Committee was reported in the newspapers: a one-year moratorium was asked, La Presse reported, to calm down public opinion and allow milk producers to adjust: *« Le comité a adopté hier une résolution demandant au cabinet de présenter un projet de loi reportant l'utilisation de la somatotropine bovine, ou BST. Le délai vise à donner à l'industrie laitière le temps de s'ajuster et de permettre de calmer les appréhensions du public au sujet de l'hormone. »*[154] Only one article echoed specific worries that some farmer groups had concerning health effects. These groups opposed citizens' wellbeing to "large and powerful companies" but no clear link was made between the regulatory process and these companies.[155]

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[151] « Canada warned about 'synthetic milk', » The Globe and Mail, 26 October 1994, sec. A, p.1.

[152] « Un comité réclame un moratoire sur l'introduction de la BST,» La Presse, vendredi 18 mars 1994, sec. A, p.9.

[153] « Une hormone synthétique risque de provoquer une controverse au Canada, » La Presse, jeudi 10 mars 1994, sec. A, p. 8.

[154] « Un comité réclame un moratoire sur l'introduction de la BST, » La Presse, vendredi 18 mars 1994, sec. A, p.9.

[155] « Production laitière: une hormone inquiétante,» La Presse, mercredi 27 juillet 1994, sec.A, p.9.

At the end of 1994, the Globe and Mail published two articles on an alleged conflict of interest of a public official who testified before the Standing Committee on Agriculture in the name of the Canadian Animal Health Institute while being on a leave of absence from Health Canada. In 1995, as the one-year moratorium was getting to an end. Opponents were reported to ask this moratorium to be extended. Consumers, they argue, did not want this product to be used. Letters from readers came in support of this position.

The story came back in the media in July 1997 when La Presse reported that milk producers had asked that Ottawa give solid guarantees before rBST was approved. Their demand that the auditor general examine the approval process and that international organisations confirm the safety of the product was an indication that their trust in Health Canada was getting declining. The same year, Health Canada was also in the middle of a controversy over nifedipine and the tainted blood scandal also put this department on the spot.

In the first half of 1998, press coverage had started to intensify in the Globe and Mail but was remaining at the same low levels in La Presse. Risks were now starting to be discussed more often although still sporadically. The Globe and Mail published articles on the risks of creating superweeds out of herbicide tolerant plants; on the terminator technology or on Arpad Putzai's controversial findings concerning the toxicity of GM potatoes on rats. On the international scene, one could read stories about Prince Charles taking position against GM food or the referendum in Switzerland.

Press coverage however started to increase in the Globe and Mail around September of that year with new outcomes concerning the case of bovine growth hormone. Contrary to what happened in France where GMOs could rarely find support in the media, it is worth noticing that each attack on Health Canada was counterbalanced by Globe editorials supportive of rBST and the agency's work. La Presse picked up on the story much later, in January of 1999.

In the fall of 1998, Health Canada was in the middle of a scandal that could further harm a reputation already challenged by the tainted blood scandal. On September 17th, a Globe article titled "Cover-up at Health Canada" reported concealed evidence and pressured scientists:

> *"The federal Health Department has concealed evidence about the dangers of a genetically engineered hormone that boosts milk production in cows, environmentalists and scientists charged yesterday. The Health Canada scientists told an internal labour board they were being pushed to approve the*

> *bovine-growth-hormone despite their concerns that it wasn't safe. The six scientists said they had been ordered by their superiors not to speak publicly on the issue."*[156]

Furthermore, the article revealed that the Senate Standing Committee on Agriculture had been denied access to important information in the course of his inquiry. The information was in the end revealed through the lengthy access to information procedure.

> *"The documents released yesterday were obtained under an Access to Information request. (...) The Senate's agriculture committee is investigating the safety of the bovine-growth-hormone for humans and animals, and had asked Health Canada to provide the scientific evidence it is considering. (...)It is not the first time the Health Protection Branch has been criticized for secrecy or for putting the interests of drug companies before those of Canadians. The branch played a key role in the tainted-blood tragedy of the 1980s."* [157]

As the story continued to be discussed in the media,[158] a Globe editorial came to the defence of Health Canada. Recognizing the worrisome aspects of Health Canada's scientists "*standing up in front of a tribunal*" saying that they had been forced to approve something possibly dangerous to Health, the editorial also reminded the readers that somatotropine was a natural product. BST was "*virtually the same"* whether it was *"the fruit of bioengineering"* or whether it was *"isolated from cows' pituitaries*." The fact that information was kept away from a legitimate public inquiry of the Senate was not discussed. Attention was drawn to the possibility that the debate was simply irrational and uninformed:

> *"Pointing fingers at the production process reminds us of the sophistic debate that occurred at the end of the last century over whether "natural" ice -- frozen pond or lake water -- was superior or inferior to "artificial" ice -- water frozen in a refrigerator. (...) If there is a food-safety issue over BST, the government cannot ignore it. But if safety is just a pretext to subvert*

[156] Anne McIlroy, "Cover-up alleged at Health Canada. We're pushed to approve drug, scientists say," The Globe and Mail, 17 September 1998, p. A12.

[157] Anne McIlroy, "Cover-up..."

[158] "Hormone- safety study rushed," Globe and Mail, September 19, 1998.

> *biotechnology, the scientists and the Sierra Club should be ashamed of themselves."*[159]

But Health Canada's reputation continued to be mauled. On October 27 and 29, the story made it to the front page of the Globe: the government was, this time, reportedly trying to control scientists' testimony before the Standing committee on agriculture.

> *"An internal document shows the federal Health Department had an aggressive plan to control the testimony of scientists who appeared before a Senate committee last week to explain how they were pressed to approve a drug they don't believe is safe.(...) But the government's strategy document, dated Oct. 20, shows the department planned to send their superior to the hearing whether he was invited or not."*[160]

Two days later, readers could learn on page one of the Globe and Mail, that the office of the Information Commissioner was investigating after receiving a complaint that employees at Health Canada may have shred important documents in an attempt to cover-up irregularities in the scientific evaluation of rBST. Several employees secretly reported an unusual level of paper shredding after the testimony of Health Canada scientists. The article went on reminding readers about the tainted blood case: *"Canada's Health Department does not have a clean record on document-shredding. In recent years, senior officials at the department destroyed documents that might have been a key to understanding the tainted-blood tragedy of the 1980s."*[161]

The controversy continued to be covered by the Globe until the end of the year. In December, Health Canada announced that the decision about rBST approval had been delayed for at least 6 months. The government had asked two external expert panels, one from the Royal College of Physicians and Surgeons and the other from the Canadian Veterinary Medical Association, to evaluate the hormone and make recommendations to the government. The appearance of conflict of interest that came to question the impartiality of the experts that composed the panels did not however stop the government from defending his decision.

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[159] The Drama in cow's milk," editorial, The Globe and Mail, 19 September 1998, sec.D, p. 6.

[160] Anne McIlroy, "Ottawa tried to control scientists' testimony Researchers raised fears about safety of controversial hormone," The Globe and Mail, 27 October 1998, A1.

[161] Anne McIlroy, "Health Department accused of shredding documents Complaint intensifies controversy over hormone," The Globe and Mail, 29 October 1998, p.A1.

> *"Yesterday, the Council of Canadians held a press conference questioning whether those panels are truly impartial. They noted that Rejeanne Gougeon, a member of the human health panel, was a consultant for Monsanto from 1993 until May of this year. She also published a paper in 1994 that was supportive of the drug. The Canadian Veterinary Medical Association issued a public statement in 1994 declaring that the hormone, which is in use in United States, "poses no threat to human safety." But Dr. Ian Dohoo, chairman of the seven-member veterinarian panel, says the press release does not represent the views of the association. Mr. Weiner [Joel Weiner was a senior Health Protection Branch official] defended the two panels, saying they were pre-eminent Canadian scientists in their field who had the integrity to make recommendations about the drug."*[162]

On December 22nd, another Globe and Mail editorial came to the rescue of BGH. Health Canada, it was argued, was being too cautious in its approval process. Farmers needed BGH and Monsanto, the producer of rBST, was unjustly being demonized: *"The scenario is something along the lines of "evil chemical company trying to destroy the purity of cow's milk." (...) Even this page -- in most matters, we're twice as cautious as the average Canadian -- believes the furor over BST is misplaced. Let's get on with the approval."*[163] On December 24, the Globe and Mail announced that the labour tribunal had "dismissed the complaints of the six Health Canada scientists." The tribunal however recognized not being able to conclude on the scientific aspect of the case.[164]

rBST: Concluding the story

Nineteen-ninety-nine saw the end of the story about rBST when the Information commissioner concluded that there had not been improper destruction of documents related to the approval process and when Health Canada reached a decision about BGH.[165] Expert panels had come to the conclusion that milk produced from cows treated with BGH was safe but that the drug could increase the frequency of mastitis in cows.

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[162] Anne McIlroy, "Approval for bovine growth hormone hits roadblocks," The Globe and Mail, 04 December 1998, sec. A, p.4.

[163] "We'll get it when the cows come home Why is it taking so long to approve the BST hormone?" Editorial, The Globe and Mail, 22 December 1998, sec. A, p. 26.

[164] Anne McIlroy, "Tribunal dismisses complaints over drug-approval process Scientists raised concerns about the safety of bovine growth hormone," The Globe and Mail, 24 December 1998, p. A5.

[165] Anne McIlroy, "Cow-data shredding innocent, probe says Health Canda employees absolved over files about controversial hormone," The Globe and Mail, 13 January 1999, p. A7.

The expert panel appointed by the Canadian Veterinary Medicine Association had thus recommended not approving the product on the basis of animal-health concerns.[166] This news made it to the front page of the Globe and Mail. For Monsanto, this decision was evidence of a flawed and unreliable drug-approval process: "other drug companies may decide not to bother even submitting their products for approval."[167] The company however remained determined to change the decision and get his veterinary drug approved in Canada.

But questions remained. There were reports on scientific studies conducted in Europe and that reached different conclusions about human health impacts.[168] Furthermore, the Senate committee was still asking questions and inquiring about the pressure that was allegedly put on Health Canada scientists.[169] Some of their conclusions were reported in the Globe and Mail: the federal government should review the drug approval process.[170] Noteworthy, during the public controversy, the work of the Senate Committee was attacked in the press with such vehemence that the co-chair of the Senate's agriculture committee, ex-minister of agriculture Eugene Whelan felt he had to answer back publicly: *"As several Canadian media outlets scramble to put a negative spin on the Senate standing committee on agriculture and forestry's current investigation of the growth hormone rBST, I feel obligated to respond to some of the charges."* [171]

But for the *Globe and Mail*, the work of the Standing Committee was perceived as an attempt to make petty politics at the farmer's expense. What was Canada waiting for to approve BGH? The hormone was already used in many countries and the best available science had been used to evaluate it. In their view, conclusions reached by the expert panel on veterinary medicine were the product of awkward data gathering and analysis. And the work of the Senate Committee was clouded over and described as useless and politically biased: *"In March, a Senate committee – that other august group of savants – weighed in with its view that both Health Canada and an independent assessment panel that Health Canada assembled to look at rBST didn't understand the possible dire health effects of the substance."*[172] Why not rely more on the US Food and Drug Administration to get solid evidence based on years of use on dairy cows?

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[166] Anne McIlroy, « Ottawa refuses to approve bovine growth hormone, » The Globe and Mail, 14 January 1999, A1. "Non à l'hormone de croissance bovine," La Presse, 15 janvier 1999, O12.

[167] Anne McIlroy, « Drug-approval process flawed, rejected hormone maker says," The Globe and Mail, 15 January 1999, A3.

[168] "Bovine hormone risky: report," The Globe and Mail. 23 March 1999, p. A5.

[169] Stéphnane Gagné, « Hormone Bovine, » La Presse, 31 janvier 1999, C12.

[170] Anne McIlroy, "Drug-process review proposed," The Globe and Mail, 12 March 1999, p.A7.

[171] Eugene Whelan, « Why I am resisting the push for rBST in cows? » letter to the editor, The Globe and Mail, 12 January 1999, A19.

[172] "The science of cows, the madness of politics. Who needs cheap, safe milk? Not us, we're Canadian," editorial, The Globe and Mail, 15 May 1999, sec. D, p. 6.

According to this editorial, the reason why Canada said no was because of the "politics of inefficiency": the control of price and demand in the milk sector.

This is how a story that was highly controversial and that brought doubts over regulatory authorities ended in the press. Not only were there few reports on the conclusions reached by one of our democratic institutions (the Senate Standing Committee) but their work was also discredited.

The Biosafety protocol

The Globe and Mail only published 4 articles on the Biosafety protocol in February 1999 but the news that Canada may have helped torpedo the agreement was put up front, on page two of the newspaper. The role Canada played in the Cartagena negotiations for an agreement on a biosafety protocol in February of 1999 was said to be embarrassing for Canadian environmentalists. Canada was even accused of serving as a "mouthpiece for the Americans" during the negotiations.[173]

Canada was part of a group of grain-exporting countries that included the US, Australia, Uruguay, Argentina and Chile. They opposed a group of developing nations that were in favour of an accord that would have given them the right to restrict or deny imports of GM organisms and that would have made producers of GMOs liable for any environmental or economic damages.[174] This group was also concerned to get more control over the extraction of local plants and organisms by multinational companies. In response to these demands, the industry group – which included Canada – made a statement according to which they would favour a protocol that would "assure that the growing benefits of biotechnology for the world's population don't come at the expense of biodiversity."[175]

In response to the accusation of sabotaging the accord, a member of the Canadian delegation, Paul Haddow, responded that the proposed agreement had too many trade implications. Canada would however gladly help any developing country implement a regulatory framework similar to its own: *"Canada is anxious to help developing countries implement a regulatory approach to genetically modified crops that is similar*

[173] Declaration of the spokesman for Greenpeace International. In Anne McIlRoy, "Canada accused of scuttling biotech deal," The Globe and Mail, 26 February 1999, A2.

[174] Ricardo Maldonado, "Nations disagree on trade in modified organisms,» The Globe and Mail, 18 February 1999, B11.

[175] Ricardo Maldonado. « Nations disagree...".

to the one in place here, Mr Haddow said."[176] This declaration was in perfect agreement with the prevalent discourse within Canadian regulatory authorities: Canada has one of the best regulatory systems; the safety of Canadian foods is recognized worldwide; and Canadians have every reason to be proud of it.

Safety of GM food

In 1999, discussion about food safety of GMOs and environmental risks became more frequent in the Canadian media. Canadians were starting to realize, as Canadian newspapers were increasingly paying attention to it, that they had been eating GMOs for up to 5 years without knowing it.[177] They also learned that most of the processed food available on grocery shelves used ingredients from GMOs. Yet, there had been very little public discussion about the risks of GM food.

In 1999, Canadians were also starting to be exposed to the fact that GMOs had been grown on large scale on their territory, both commercially and experimentally. A Globe and Mail article stated that, during the past 10 years and according to federal statistics obtained, by the Green Party of Canada, "biotechnology companies and agricultural researchers" had already conducted "more than 4200 field trials in Canada, mostly in the Prairies, using genetically altered crops." This article reported that the Canadian government was using these data to attract some more biotechnology firms who would want to escape growing opposition to GMOs in their own countries:

> *"The high number of experiments is being touted by the federal government in a recent advertisement designed to attract to Canada European biotechnology companies that face organized and often militant opposition to testing genetically altered crops in their country. The government said in its ad that the "thousands" of field trials in Canada are "more than in the entire European Union" and that Canada is becoming a world recognized centre for biotechnology."*[178]

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[176] Anne McIlRoy, "Ottawa accused of scuttling biotech deal Canada helped broker agreement regulating imports of genetically altered foods in 1992," The Globe and Mail, 26 February 1999, A2.

[177] Kim Honey, "Consumers in dark on superplants: professor. Benefits not weighed against possible risks," The Globe and Mail, 16 April 1999, A11:

[178] Martin Mittlstaedt, "Genetic experiments on Canadian crops top 4200 in decade. Green party fears ecological consequences while Ottawa welcomes more biotech firms," The Globe and Mail, 19 mars 1999, A11.

The Canadian Food Inspection Agency was reassuring: precautions have been taken to ensure the safety of these trials. Canada's system, the agency responded, "is recognized internationally as being a very, very good system."[179]

Many questions however remained and the growing revelations were continuing to feed the debate along with reports from European countries adopting stricter regulations, banning certain products or being the scene of strong militant opposition to GMOs.[180] Pressures began to be felt to review the regulatory system for approval of GMOs and in favour of labelling. Well known ecologist, Dr. David Suzuki warned Canadians that a "massive experiment" was being performed and the "results will only be known after millions of people have been exposed to these foods for decades."[181]

Opposition in Canada was met with equally vehement calls to defend the existing regulatory system and Canada's accomplishments in the sector. In their line of defence, government officials frequently underlined that Canada's regulatory system and food safety mechanisms were recognized internationally as one of the best. Reluctance from European countries was said to be an act of protectionism and even, of paranoia. Arguments from opponents were also discredited and said to be irrational, dishonest, or motivated by fear of new technology.[182] Some were sometimes ridiculed: *"Once again, most of the risk associated with genetically engineered foods is potential. Could happen. Then again, a bus could hit me the moment I walk out the office door."*[183]

The legitimacy of opponents was also discussed: "*unelected, unchecked by the discipline of power, Greenpeace somehow makes public debate revolve around its preoccupations and prejudices."* Greenpeace was accused of distorting the issue for his own good, of having become the politician Canadians never elected.[184]

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[179] Martin Mittlstaedt, "Genetic experiments on Canadian crops..."

[180] "Prince bans modified crops." The Globe and Mail, 11 June 1999, A16; Irene Marushko, "Casco says it won't buy genetically altered corn. Miller fears losing European customers," The Globe and Mail, 22 May 1999, B10; "La résistance aux aliments Frankenstein s'organise, » La Presse, 16 Août 1999; Heather Scoffield, "Honey, there's a gene in my soup," The Globe and Mail, 21 August 1999, D5; Michael Byrnes, "Transgenic food rules in Asia threaten U.S. exports. Battle over genetics spreads as countries pass labelling laws," The Globe and Mail, 2 September 1999, B7; Brandon Mitchener, "Animal feed under EU's microscope." The Globe and Mail, 6 September 1999, B6.

[181] "Suzuki issues warning." The Globe and Mail, 19 October 1999, A2.

[182] "Fear of Science and Love of the Land," editorial, The Globe and Mail, 16 August 1999.

[183] Paul Sullivan, "GM food carries risks, but so does life," The Globe and Mail, 16 October 1999, A25.

[184] "It's not easy being antigreen(peace). Questionning Greenpeacers as if they were unelected," editorial, The Globe and Mail, 1 October 1999, A10.

In August, the federal government announced that it was preparing to fight for "strict international rules that would force countries to accept safe genetically modified foods, even if their consumers don't want them." The trade platform prepared for the November WTO negotiations in Seattle included joining the U.S. to ask for a new set of scientific rules for GM foods. The best available science should be the basis of evaluation. But since no original testing was done in the evaluation process, opponents argued that there were in fact no real assessments done in Canada for GM food or plants. Regulators simply based their decision on existing studies done by biotechnology companies. Was it what Canada was referring to when it declared using the "best available science"?[185]

However reassuring the government's answer to the debate was, McCain Foods chose, in November, to stop using GM potatoes for processing.[186] At the end of the year, farmers and agri-food business were really concerned that food fears would spread to Canada and the United States. The recent involvement of Greenpeace had them concerned that they would indeed succeed in raising public uproar like they did in Europe. In December, the government was reacting and announcing that, in response to growing fears among Canadian consumers, it would create an independent committee of experts to suggest changes to the biotechnology regulatory system.[187] Three ministers joined together to make the announcement: Agriculture, Health and Environment.

Labelling

Although the subject had not yet been very present in the media, labelling was already a preoccupation of the federal government. A Globe article reported that the government had already been probing the population about the possible effects of labelling on GM products acceptance. A study based on focus groups across Canada had revealed that labelling would create major problems for biotechnology food in the marketplace.[188] Moreover, consumers were increasingly asking that GMOs be labelled.[189] When Greenpeace entered the battle with the aim to "make consumers aware" and to "knock genetically modified food off the shelves", the government was

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[185] Heather Scoffield, "Ottawa to fight for global biotech rules," The Globe and Mail, 5 August 1999, A4.

[186] Canadian Press, "McCain bans 'Frankenstein' spuds." The Globe and Mail, 29 November 1999, A3.

[187] Heather Scoffield, "Committee to study how food safety, is controlled Ottawa responding to biotechnology fears," The Globe and Mail, 18 December 1999, A3.

[188] Canadian Press, "Would you buy those bananas if they were labelled 'Biotech'?" The Globe and Mail, 24 April 1999, A9.

[189] Alexandre Sirois, "OGM : gare à l'indigestion, » éditorial, La Presse, 23 août 1999.

already contemplating the possibility of announcing new voluntary standards for GM food.[190]

When the intention was announced, the Globe and Mail presented it as an answer to consumers' preoccupations, as the rules consumers had been waiting for: "Consumers may soon be able to tell which foods in their grocery stores contain genetically modified foods." Was it out of ignorance or because the voluntary standards were deliberately presented as such by the government? The announcement of a voluntary standard was described as "major change in direction."

> *"The government of Canada believes in the right of the consumer to have access to information as it relates to biotechnology and food," Agriculture Minister Lyle Vanclief said in a statement. "This is a complex issue and any labelling has to be meaningful to consumers." He did not eliminate the possibility of making standards mandatory."*[191]

Even though the standards that were announced were far from being the mandatory labelling rules that consumers wanted, it kept being referred to in the media as something consumers had been asking for: "...*Canada is preparing to introduce its own labelling requirements for genetically modified foods in response to consumer demands for information*."[192] But the government knew that a label for GMOs and products containing GMOs would only keep consumers away and that most companies did not want such labelling rules. None the less, some food producers had already started labelling their products as GMO-free, putting those companies using GM ingredients at a disadvantage.

The standard that was announced truly targeted products labelled as GM-free. The imposition of a standard would only make it more difficult for those who wished to identify as non-GM. They would have to prove their claim. Since GM and non-GM crops were not segregated in Canada and because cross-pollination had already started to

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[190] Heather Scoffield, "Greenpeace gets ready to join genetically modified food fight." The Globe and Mail, 1 September 1999, A4; Heather Scoffield, "Genetically altered food may soon be labelled. Ottawa changes mind on setting standards," The Globe and Mail, 18 September 1999, A15; Marie-Andrée Amoit, "Une patate chaude: l'étiquetage des OGM," La Presse, 19 septembre 1999, C5.

[191] Heather Scoffield, "Genetically altered food may soon be labelled," The Globe and Mail, 18 September 1999, A15.

[192] Shawn McCarty, "Japan's food labelling gets mixed reviews." The Globe and Mail, 20 September 1999, B3.

contaminate organic crops, this was increasingly impossible. Until the standards were ready, no labelling was to be tolerated.[193]

At the end of September, Greenpeace and the Council of Canadians started to put pressure on Loblaws to remove GM ingredients from its President's Choice and No Name brands and asked grocery retailers to start labelling GM food as such.[194] But, contrary to what had happened in France, big grocery chains did not end up being on the side of labelling. After all, GMOs were already used in so many processed foods in Canada and the absence of segregation made traceability close to impossible.

At the end of November, the issue started to take a more political turn when the Bloc Québécois put forward a bill to make labelling mandatory. Raising doubts as to the real intentions of the Federal government that seemed to favour industries at the expense of public safety, the Bloc argued that "*once labelling is mandatory, companies that produce genetically altered foods will have to invest in research to prove their products aren't harmful*." [195]

The Biosafety Protocol...again

In January 2000, negotiations on the biosafety protocol in Montreal attracted the attention of both dailies and were the occasion for both supporters and opponents to express themselves on the issue. In this case, the Canadian position was supported by Globe editorials and scientists. Canada was part of a group formed of exporting countries which were asking that the protocol respected and be submitted to WTO rules.[196] This group of countries opposed developing nations which were backed by Europe. This latter group was in favour of the application of the precautionary principle. But Europe's position on precaution was reported as a manoeuvre to keep out legitimate imports, as a strategy against progress. [197]

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[193] Voluntary standards were ready in 2004.

[194] Heather Scoffield, "Protesters target stores selling genetically engineered food," The Globe and Mail, 28 September 1999, A5; "Greenpeace contre le transgénique," La Presse, 30 septembre 1999, p.A6.

[195] According to Hélène Alarie, Bloc MP, « Le gouvernement canadien a abdiqué ses responsabilités quant à l'information, la formation et la protection du public en ayant comme unique préoccupation de favoriser l'essor des industries de la biotechnologie. » in « Aliments génétiquement modifiés : la santé avant le commerce, » La Presse, 12 Octobre 1999, B3; « Labelling : Bloc calls for labelling of altered foods, » The Globe and Mail, 13 November 1999, A7.

[196] AFP. "Organismes génétiquement modifiés: Ottawa insiste sur le respect des règles de l'OMC » La Presse, 18 janvier 2000, C15.

[197] "Frankenfoods and politics. The debate over biotechnology turns precaution into cement," editorial, The Globe and Mail, 27 January 2000, A18.

> *"The objection to this is obvious. What the Europeans have devised is not a precautionary principle but a flimsy pretext for closing off markets. If it is put into a UN protocol, it will be so that they can get around world trade rules that would otherwise declare the practice illegal."*[198]

> *« What could kill the great peoples of Europe? The short answer seems to be anything that arrives from the United States and Canada that is treated with hormones or genetically modified."*[199]

Opponents gathered in Montreal to put pressure on negotiators and asked for a protocol that would not be submitted to WTO rules. Their slogan was: "stop genetic pollution, biosafety now!" On the other side, a group of Canadian scientists publicly expressed their support for the technology.

> *« À l'opposé de la manifestation des écologistes, une centaine de scientifiques canadiens ont dévoilé hier, en conférence de presse, une lettre ouverte d'appui aux biotechnologies et à la recherche sur les cultures transgéniques. (…) "Les bénéfices des biotechnologies sont plus rentables que les inconvénients qui, pour le moment, se résument à des interrogations", indique en entrevue Joe Schwarcz, directeur de l'Office pour la chimie et la société de l'Université McGill, un organisme qui se dit indépendant.»* [200]

A draft protocol was agreed upon. The Canadian biotechnology industry was quick to declare that it was a win for the industry because it had recognized the importance of the biotechnology industry and of its potential benefits.[201] In France, the same protocol was described in newspapers as a victory for Europe and the precautionary principle...

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[198] Peter Cook, "Europe's food stance would harm legitimate exports," The Globe and Mail, 19 January 2000, B13.

[199] Peter Cook, "Protectionism is feeding the food safety debate," The Globe and Mail, 7 February 2000, B10.

[200] André Duchesne, « Les anti-OGM réclament un protocole "fort"» La Presse, 23 janvier 2000, p. A1

[201] Kim Honey, « Montreal conference a 'win' for giant biotechnology companies," The Globe and Mail, 31 January 2000, A17.

Growing uncertainty for Canadian farmers

In 2000, protests continued to intensify somewhat and journalists were paying more attention to the issue. Canadian biotechnology industries, research and the government had the opportunity to observe how GMOs were being rejected by the European public and how this wave of protests had already imposed important trade constraints. The recent involvement of Greenpeace in the Canadian debate had made authorities even more nervous.

All through the year 2000, this nervousness was passed on to farmers. Sales of GMO seeds had started to stall. Already, some important food companies had announced that they would not use GMOs in their products (McCain). Canadian farmers were worried that, if they did grow GMOs, they would not find a market for it at the end of the season. Farmers in France and in the UK had been forced to pull out and destroy canola fields accidentally containing some GM varieties. The Canola seeds had been grown in Canada. Reports of these destructions were felt like a shock wave by Canadian farmers and Canadian seed companies.[202] Canadian farmers, it seemed, had come to realize that because of cross pollination and because of the extent to which GMOs had already been sown in Canada, it was in certain cases impossible for them to go back to GMO-free crops: *"For Canadian growers, guaranteeing that a canola crop is free from genetically modified seed is next to impossible."*[203] If segregation had become very difficult for certain crops in Canada, news that labelling was becoming mandatory in a growing number of countries and that opponents in Canada were also pushing for the government to impose an obligation to label GMOs had nothing to please the industry or to reassure Canadian growers.[204]

Regulatory system under fire?

Early in 2000, the Canadian regulatory system's efficiency was questioned but never greatly challenged. The Canadian press reported a few credible attacks on the regulatory authorities but it did not make much noise in the media.

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[202] "Du colza génétiquement modifié semé par erreur en France et en G.-B. » La Presse, 19 May 2000, A8; Heather Scoffield. "Sowing the seeds of uncertainty," The Globe and Mail, 12 May 2000, B10; Heather Scoffield, "Canola operation could leave Canada over Europe," The Globe and Mail, 19 May 2000, A10; Alan Freeman, "British Farmer plows under crop of genetically modified canola. Seeds inadvertently contaminated in Alberta banned in Europe," The Globe and Mail, 25 May 2000, A2.

[203] Alanna Mitchell, "The great canola conundrum," The Globe and Mail, 20 May 2000, A13.

[204] « L'étiquetage des aliments modifiés est désormais obligatoire en Europe. Tous les produits contenant au moins 1% d'OGM sont touchés, » La Presse, 11 avril 2000, p. A22; Richard Dupaul, « Étiquetage des OGM: l'Europe bouge, le Canada consulte, » La Presse, 18 avril 2000, p. C1; Martine Roux. « Manif pour l'étiquetage des OGM, » La Presse, 23 mai 2000, p. A3.

In January 2000, a network of Canadian independent scientists called Genetic Engineering Alert declared that "the federal government's own data" showed that "genetically modified foods approved in Canada have not undergone proper testing." This group of scientists and agriculture specialists that claim to have no affiliation to the biotechnology industry brought to the attention of the Press that none of the GM crops had been assessed in government labs or through human or animal feeding trials. They added that "*the research of too many scientists [was] compromised by ties to industry*" and that there was "*heavy pressure to ask pro-industry questions during research."* [205] Ottawa was also challenged by the Sierra Legal Fund and the Canadian Institute for Environmental Law and Policy (CIELAP) who issued a petition and accused the government of "*putting health and the environment on the line with weak policies on genetically modified foods*." But contrary to judicial battles in France, this "quasi-judicial" action was only mentioned briefly in the Globe and Mail and was not mentioned at all in La Presse.[206]

Opposition party member, Bloc Québécois MP Hélène Alarie, forced a motion at the Commons' Standing committee on Agriculture to force this committee to inquire on the long-term impact of genetically engineered plants and the possibility to segregate GM from non-GM crops. Again, this initiative did not get much attention. Only La Presse mentioned it briefly...with no follow up.[207]

Industry and the government on the defensive

After having been scared by increasing protests against GMOs and fears that Canadians would end-up rejecting GMOs like Europeans did, it looks as though supporters of biotechnology in Canada adopted a coherent discourse to defend GMOs. In France, at the time, every time an actor supported GMOs, it was with a lot of nuance, always reassuring people that all precautions should be taken to insure food security and avoid environmental risks. In Canada, things were a lot different with no evocation of potential risks, just affirmation of the superiority of the Canadian regulatory system. According to supporters, Canada had one of the best regulatory systems in the world; it had an enviable reputation worldwide for food safety; there was nothing really new about biotechnology, just faster and more precise crop selection; biotechnology was a key to

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[205] « Les OGM ne seraient pas testés adéquatement, » La Presse, mercredi 19 janvier 2000, p. B5

[206] Heather Scoffield. "Ottawa challenged on modified foods." The Globe and Mail, 9 May 2000, A7.

[207] Alexandre Sirois, « Les députés fédéraux évalueront les risques des OGM, » La Presse, 1 avril 2000, p. A20.

better environmental practices and wealth; finally, biotechnology might also be a way to reduce world hunger. [208]

> *"'The federal government has argued loudly that its testing and assessment procedures for GM foods are based on sound science and one of the best systems in the world. 'We have a thorough and comprehensive and rigorous assessment to make sure the food is safe." Health Canada spokeswoman, Lynn Lesage said."* [209]

> *"Ultimately, it is important for Canadians to remember that we have a food regulatory system that ranks with the best in the world and is emulated by many. Each product is assessed on a case-by-case basis, using the best available safety and risk-assessment procedures."*[210]

In an editorial about the debate over the precautionary principle, readers were invited to consult CFIA's website to observe how "*scrupulously this country*" was "*balancing the risks and benefits of agricultural biotechnology*" and to see "*how even potentially revolutionary change seems manageable when their precautionary principle isn't being used to batter the ignorant*."[211] Another editorial also invited readers to visit this website. It pleaded for people to start to educate themselves: *"...people should do everything they can to circumvent an oft-confusing and increasingly polemical public debate. (...) Contrary to what many people think, there is testing and data evaluation going on in all contentious areas."*[212] Rejection of GMO products by some European countries was decried as irrationality and protectionism. In a press conference at the occasion of a meeting with President Chirac, Prime Minister Chrétien declared that, when it came to GMOs, "French consumers suffered from a fear of the unknown" and that,

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[208] Lorne Hepworth, president of the Crop Protection Institute, "which represents manufacturer, developers and distributors of plant life science solutions for agriculture" expressed his personal view in a 944 word-long article in the business section of the Globe and Mail, 5 January 2000, B10, "Plant biotechnology doesn't create Frankenfood monsters." Reuter News Agency, « Altered crops urged to feed world poor, » The Globe and Mail, 29 February 2000, A15.

[209] Heather Scoffield, "Modified crops not tested fully: scientist," The Globe and Mail, 19 January 2000, A8.

[210] Gord Surgeoner, "Genetically modified fries with that?" letter, The Globe and Mail, 24 January 2000, A13. Surgeoner was President of Ontario Agri-Food Technologies.

[211] "Frankenfoods and politics. The debate over biotechnology turns precaution into cement," editorial, The Globe and Mail, 27 January 2000, A18.

[212] "Genetically modified food for thought," editorial, The Globe and Mail, 4 Marsh 2000, A16.

"*Europeans' fear of genetically altered food" was not "based on science"*.[213] In sum, in 2000, there was in the press no evidence of self-questioning on the part of the Canadian authorities. The government announced that there would be some restructuring of Health Canada, nothing more.

Consultations

The government and industry which had so far been present in the media to explain the regulatory framework were however somewhat destabilized by the extent to which the pressure and opposition were intensifying. In late January 2001, the panel of experts set up by the Royal Society of Canada at the demand of the ministries of Health, Environment and Agriculture released its report on the regulation of food biotechnology in Canada. This report, known as the Royal Society report, had been commissioned a year before by the federal government. Newspapers reported that the panel was critical of the food-safety system and recommended major changes to the regulatory framework. Experts suggested that the dual role of the government to promote biotechnology and to protect the public was giving the impression of a conflict of interests. The panel was reported to have found the substantial equivalence approval practice to be scientifically unjustifiable. Experts, however, did not find scientific grounds to support mandatory labelling. For some observers, the panel's findings meant that Canadians had been treated as human guinea pigs: *"The Royal Society of Canada's expert panel on food biotechnology reported yesterday that Ottawa's food safety system is plagued by conflicts of interest, a lack of transparency and ambiguous testing."*[214] The committee was also reported to encourage the government towards more transparency and to have questioned the quality of previous approval procedures: *« Le comité recommande notamment que l'analyse des résultats de tous les tests effectués sur les nouveaux organismes transgéniques soit revue par un comité d'experts indépendants. Il recommande également de confiner l'élevage commercial de poissons transgéniques à l'exploitation de viviers terrestres. »*[215]

Apparently, this report was not what the government had been expecting. It was reported that standard congratulatory notes by the three ministers who had commissioned

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[213] Declaration of Prime Minister Chrétien. In Anne McIlroy, "Food produced in Canada safe: PM Chrétien offers assurances to French on genetically modified products," The Globe and Mail, 22 June 2000, A6.

[214] Heather Scofield, "Officials blast food-safety report," The Globe and Mail, 6 February 2001, A9.

[215] Dennis Bueckert, « Ottawa défend sa politique d'examen, » La Presse, mardi 6 février 2001, A4.

the study were suddenly pulled from Health Canada's web site. It was followed by a "*chilly rejection of the work*".[216] As soon as the report was tabled, regulatory authorities worked to discredit its conclusions and the experts of the Royal Society. Government officials declared that "*the experts had a poor understanding of the processes*": *"Government officials say a panel of scientific experts commissioned by Ottawa to examine the food-safety system does not know what it's talking about when it reports that the government system is flawed."* [217]

It is hard to imagine that the French government, which so often relied on experts to get advice, would discredit the work of scientists like the Canadian government did with the Royal Society report. Even more troubling, elected officials seemed to be relying on government officials and spokespersons to deliver their message to the media. Conclusions were never discussed rationally; they were rejected as a whole and the government never reflected publicly on the evaluation process. One government official implied that the experts might have consulted web pages that were not meant for expert evaluation but for lay people and that, instead, they should have asked for the relevant documents.

> *"Le comité doit avoir consulté les mauvais documents sur le site Web du ministère, a avancé Mme Dodds, selon laquelle certains d'entre eux sont destinés au grand public et non pas aux experts. Conrad Brunk, coprésident du comité, a pour sa part indiqué que ce dernier s'était penché sur tous les documents accessibles à tous, mais que certains principes clés du processus de réglementation fédérale portaient à confusion. »*[218]

If this is true, it leads to the conclusion that the panel did not get all the information and all the collaboration from the three ministries involved. Again, it is hard to imagine that an expert committee mandated by the government would not get all the documents and the collaboration it needs to get the job done properly. Government officials argued that access was limited because of the access to information law. Its application, it seemed, included those mandated by responsible ministers to inquire on the issue... In France, when the government commissioned a study, the ministries and agencies involved were asked to collaborate fully.

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[216] Clayton Ruby, "Forget about labels, just eat what Ottawa puts in front of you," The Globe and Mail, 13 February 2001, A17.

[217] Heather Scoffield, "Officials blast food-safety report," The Globe and Mail, 6 February 2001, A9.

[218] Dennis Bueckert, « Aliments transgéniques. Ottawa défend sa politique d'examen, » La Presse, 6 février 2001, p. A4.

Later that year, the government was reported to be waiting for a report of the controversial Canadian Biotechnology Advisory Committee. This committee was undertaking pan Canadian consultations about biotechnologies. Consultations were reported being boycotted by over 50 organizations.[219] To get around this difficulty, the Committee chose to hold its meetings *in camera* and on invitation.

> *"Pour ses cinq audiences sur les OGM, le Comité consultatif de la biotechnologie, qui conseille sept ministres, a décidé de procéder à huis clos et par invitation, plutôt que d'entendre les avis de tous les intéressés. "Certains experts sont intimidés par la présence des médias" a expliqué la coprésidente du Comité, Suzanne Hendricks, pour justifier le huis clos. »*[220]

Conclusions of the committee which was perceived as industry friendly came as a surprise. It reportedly came to complement the findings of the Royal Society report towards more transparency and better access to information and scientific data. It even suggested that, because of cross-pollination, neighbouring farmers should be informed of the location of GM crops.[221]

> *« Comme la Société royale, le CCCB demande notamment que les données scientifiques dont les experts de Santé Canada se servent pour homologuer un OGM soient rendues publiques. En ce moment, Santé Canada refuse de le faire parce qu'elle estime qu'il s'agit de données confidentielles qui appartiennent à l'entreprise qui fait la demande d'homologation. Le CCCB rappelle que ces mêmes données sont publiques dans d'autres pays.»*[222]

Even if it was moderate, this reports led some analysts to conclude that there must be imminent peril for this industry oriented committee to encourage Ottawa to make changes to its regulatory framework.[223]

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[219] Michael Valpy, "Feed us the facts," The Globe and Mail, 21 August 2001, A13. Michael Valpy, "Circumspect report likely on GM foods," The Globe and Mail, 20 August 2001, A5.

[220] Mathieu Perreault, « Consultation controversée sur les OGM, » La Presse, 11 avril 2001, p. A8.

[221] Daniel Leblanc, "Monitor GM food Safety, Ottawa told Canada unprepared for challenges posed by genetically modified products, report says," The Globe and Mail, 24 August 2001, A9.

[222] Judith Lachapelle, « OGM: le gouvernement doit être plus transparent, clame un nouveau rapport, » La Presse, 24 août 2001, p. A1.

[223] Agnès Gruda, « OGM: mi-figue, mi-raisin, » La Presse, 25 août 2001, p. A22.

Genetic Pollution

In 2001, the Canadian population was beginning to be more familiar with the concept of genetic pollution. The Percy Schmeiser case, Starlink and GM salmon all contributed to an increased awareness of the problem. Farmers were also increasingly worried about the phenomenon. They were starting to think that GMOs might not be this good for business. The market introduction of GM wheat was blocked by the Canadian Wheat Board who argued it would make them lose substantial market shares: *"If it is permitted in Canada, there will be enormous problems with identifying and segregating the new strain (...). ...buyers will turn elsewhere even before problems occur, not willing to trust that the crops can be effectively segregated."*[224] The CWB argued there should be evidence of customer acceptance before the seed is approved. The story made it to page one in the Globe and Mail.[225] The story also served to highlight the problem of cross-pollination: *"...the introduction of genetically modified canola has already wiped out the certified organic canola market, because producers have no way of guaranteeing that their product has not been contaminated."* [226] It was argued that the same would happen to wheat producers if GM wheat was to be approved.

Labelling

Labelling was the most strategic theme of 2001 press coverage in Canada when the government and grocery distributors came together as allies to fight rather aggressively all attempts to label GM foods. Three events illustrate this development.

Firstly, since 2000, activists had been visiting supermarkets to increase Canadian buyers' awareness that most processed foods contained GMOs. Some pushed the action as far as to put "contains GMOs" stickers directly on supermarket products. One activist was tried and sentenced for his action. Secondly, Unibroue, a micro-brewery located in Quebec was ordered to get rid of its GMO-free labels. This company argued that it would make them lose important European market shares but in the end, it was forced to comply to CFIA's orders.[227]

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[224] "Don't risk wheat sales by approving this seed, "editorial, The Globe and Mail, 3 April 2001, A14.

[225] Colin Freeze, "Buyers distrust modified wheat,"The Globe and Mail, 21 May 2001, A1.

[226] Laurie Bailey, "Group seeks ban on new modified wheat strains," The Globe and Mail, 1 August 2001, A5.

[227] Colin Freeze, "Debate over GM beer in Canada comes to a head," The Globe and Mail, 5 June 2001, A5.

Finally, Loblaws' made public its decision to take any products labelled as GM-free off its supermarket shelves. They argued that companies had to wait for voluntary standards to be ready before GMO-free labels were to be allowed.[228] Their concern was to provide consumers with trustworthy and meaningful information. But companies targeted by the decision of Loblaws were often small and complied in fear of losing access to large grocery stores.[229] In so doing, Loblaws supported, defended and informally enforced the government's positions on labelling. It was also an occasion to promote their own line of organic products, the only label that indirectly informed consumers that they were not eating GM food. Other big grocery chains soon followed Loblaws' path and warned that products labelled as GMO-free would be removed from supermarket shelves.[230]

There were many reactions to this decision. Consumers were generally outraged. Newspapers reminded readers that polls were showing that 95% of Canadians were in favour of mandatory labelling. When the Caccia bill for mandatory labelling was introduced in Parliament, it received a wave of public support. *"When it comes to genetically modified food, [Charles Caccia] expresses little or no confidence in the voluntary route. 'This is not a complex scientific nor technical issue,' he told the House of Commons yesterday. "It simply comes down to the public's right to know."*[231]

For a while, in the summer of 2001, it almost seemed as if mandatory labelling was going to happen in Canada. Even Health minister Allan Rock publicly declared himself in favour of mandatory labelling which left observers unsure and sceptical of the government's real intentions.[232]

> *"Labelling genetically modified food is a case in point. The government has twisted itself into a genetically modified pretzel in trying to satisfy both an agrifood industry strongly opposed to labelling and consumers worried about safety. The government has promoted a voluntary plan that would be funny if it weren't so pathetic."*[233]

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[228] Voluntary labelling standards were ready in 2004.

[229] Kevin Cox and Ingrid Peritz, "Loblaws orders GMO-free labels removed," The Globe and Mail, 13 June 2001, A6.

[230] "Guess, say the grocers," editorial, The Globe and Mail, 18 June 2001, A16.

[231] Edward Greenspon, "A private member's bill worth supporting," The Globe and Mail, 8 May 2001, A19.

[232] "Rock wants labelling on modified foods," The Globe and Mail, 5 October 2001, A12.

[233] Edward Greenspon, "Will the real Allan Rock please stand out?" The Globe and Mail, 13 October 2001, A21.

Shortly before the vote, the government decided to "inform" deputies that Health, Agriculture, Industry and Trade ministers had decided to ask the Standing committee on health to investigate whether GM food needed mandatory labelling. This was interpreted as a strategy to provide a way out so that members of parliament could honourably vote against the bill without putting their seat in too much danger: *"By passing the issue to a committee, Mr. Rock and his cabinet colleagues can vote against the private member's bill without appearing to close the door on mandatory labelling."* [234] The strategy worked well. After September 11, media attention was directed elsewhere and the vote against the Caccia bill went almost unnoticed.[235] Allan Rock did not show up for the vote: 126 against, 91 in favour.[236]

Conclusion

In France, the coming into the market of GMOs happened in a context of ongoing agricultural crisis with the USA and of WTO negotiations and at a time when mad cow disease and tainted blood were still making daily news and had seriously shaken people's trust in experts and even expertise as well as in the capacity of the state to address scientific issues. As was shown, these elements were to become central in the orientation taken by the press coverage in France from 1996. On this canvas, risks related to GMOs were of course constructed as health and environmental threats but they also quickly went through a process of social and political amplification. Experts' and authorities' capacity and willingness to protect the public properly were progressively questioned. From the very beginning, GMOs were described as an American invasion by an "American made" technology and the European Commission was said to have let down consumers, to have not learned the lesson of the mad cow disease, in sum, not to have respected the precautionary principle. As the press coverage intensified, it will be shown that the battle against GMOs became a battle against "productivity" in agriculture and globalisation. The question was also framed as a fight to preserve the "exception française", the French identity against what seemed to be perceived as an American invasion and GMOs became a symbol of this invasion.

In France, the fight against GMOs was eventually incorporated into the battle against globalization and "malbouffe". A leader of small farmers , José Bové, came to

234 Heather Scoffield, "Ministers attempt to defuse GFMO issue," The Globe and Mail, 17 October 2001, A12.

235 "Food labelling bill defeated in Parliament," The Globe and Mail,18 October 2001, A12.

236 Gilles Toupin, « Les Communes rejettent l'étiquetage obligatoire, » La Presse, 18 octobre 2001, A9.

personify this battle and eventually represented French "résistance" against an American-made invasion. For a while, it looked as though French authorities had lost their influence on the debate. As is shown in the dissertation, the more they tried to regain it, the more it exposed the extent of the uncertainty surrounding GMOs.

The dissertation demonstrates that press coverage from 1996 to 2001 contributed to develop a discourse that encompassed the three levels of risks described in chapter 2. The press coverage contributed to shape the discourse beyond health and environmental risks to the direct or indirect questioning of the will and the capacity of authorities and experts to protect France from these risks.

Things were a lot different in Canada. When GMOs became a polemical issue in the media, Canadian authorities already had their hands tied with previous decisions authorising large scale GM crops and field testing. This situation may explain why decisions were so fiercely defended in the media. Discrediting experts or environmental groups that were not on their side, Canadian authorities never publicly questioned any of the regulations or evaluation procedures. On the contrary, they publicly praised the Canadian framework as often as they could. The editorial bent of *The Globe and Mail* contributed to reinforce this discourse. For the most part of the study, until labelling became a central issue in 2001, editorials in the Globe also had this tendency to be very sceptical of any group being critical of the Canadian regulatory Framework.

In Canada, no media figure really took precedence in the debate; no figure like José Bové emerged. The Canadian government was very strategic in its attempts not to alert and to calm down public opinion. Opponents were very inefficient in their attempts to raise the level of public concerns. They entered the debate too late, once GMOs were already part of the Canadian reality and never succeeded in unifying their voice to convince Canadians to fight this reality. Canadian authorities kept claiming that sound science was on their side and that fears were irrational and the product of misinformation. Environmental and health risks largely remained theoretical and often were associated with Europe's supposed fear of progress and protectionism. Finally, even though Canadian institutions were exposed to important scandals, they always succeeded in dodging and neutralizing institutional risks.

APPENDIX 5.

Comparison of Participation in Public Consultations in France and Canada

The following table compares the participation at the private hearings conducted in France as part of the 1998 consultations, with the participation at round table consultations conducted in Canada for the NBS renewal in 1998. The numbers in this table are based on the list of people auditioned in France during the private hearings conducted by Senator Le Déaut in the spring of 1998 for the OPECST report on the use of GMOs. The Canadian numbers are derived from the lists of participants at the 1998 round table consultations for the renewal of the Canadian biotechnology strategy.

Table 10. By category comparison of participation at private hearings in France, and at round table consultations in Canada.

	France[1]		*Canada*[2]	
	Total	*% of total*	Total	*%of total*
Industry	48	*33*	64	*49*
Associations*	43	*29*	29	*22*
Research	36	*24*	26	*20*
Government	20	*14*	9	*7*
Other	-	-	2	*2*
Total	147	*100*	130	*100*

*Including farmers' associations

[1] Participants classified using the information available on the list of auditioned people. In appendix of JEAN-YVES LE DÉAUT, L'utilisation des organismes génétiquement modifiés dans l'agriculture et dans l'alimentation, RAPPORT 545 (97-98), Tome 1 – appendix - Office Parlementaire d'Évaluation des Choix Scientifiques et Technologiques.

[2] See appendix 6 for more detail.

APPENDIX 6

Consultations for the Renewal of the Biotechnology Strategy

Canada - 1998

The first set of consultations involved roundtable discussions in five Canadian cities and concerned three themes: the vision, objectives and principles of the renewed strategy; organisation and mandate of a proposed advisory body to replace the NBAC; and public perception and participation. The second set of consultations focused on research and development and matters relevant to six sectors: health, agriculture and agri-food, environment, aquaculture, forestry, and mining and energy. Here, discussions were built around three themes: meeting public needs, market access and strengthening the industry. In parallel, with the goal to allow Canadians to provide input on the biotechnology issues that were currently confronting the government, the Environics Research Group was commissioned to undertake public opinion research as part of the renewal process.[1]

Survey and focus groups

A telephone survey was followed by a series of ten focus group sessions in Halifax, Montreal, Toronto, Saskatoon and Vancouver. Although part of the larger consultation process, the survey questions were largely geared at understanding the limits of acceptability of biotechnology products and at knowing where public opinion stood regarding the government's involvement so far. It was almost as if the government needed to be told what constituted an acceptable attitude and where the public interest rested: Which biotechnology applications were perceived as the more acceptable? What was the level of knowledge about the technology and its applications? Would Canadians be ready to accept patents on genetically modified animals, on new plant varieties? Were Canadians aware of the regulatory framework? Did Canadians think that the government was doing a good job at regulating biotechnology? Which institutions should be in charge of regulation? What was the level of trust in those institutions? Between research to support the regulation and research with commercial applications, what should the priorities be? Furthermore, many questions concerned the credibility of a variety of

[1] Environics Research Group, Public Opinion Research. Executive Summary, For the renewal of the Canadian Biotechnology Strategy. Accessed 01/05/13. www.strategis.ic.ca/SSG/bh00239e.html

information sources and communication vectors. Did Canadians read food labels? Were they satisfied with its content? Which information channels were Canadians most likely to use? Who should provide information? Should an external advisory body be created? What should its composition be? Which issues should it address? Among various sources of information, which are the most credible? Which are the most frequently used?

The selection of the focus groups participants included only those who fell into the middle ground with regard to the familiarity with biotechnology and perception of federal government performance. The rationale was that this selection allowed "for a more representative group" and would prevent "the dominance of one or more fixed view points in the discussion." But middle ground opinions also meant that opinions could be changed either way. This group was representative of the citizens that the government eventually wanted to convince that biotechnology was a source of well-being. Participants were asked to discuss possible advantages and disadvantages of biotechnology applications, in sum, to name their "top-of-mind" concerns. It also tested the idea of an independent external advisory body to advise the government. Among the broad conclusions: ethics should be integrated into the development of a biotechnology strategy and important values should be respected: public safety, environmental protection, biodiversity. Again, did the government really need a series of focus groups to find out where public interest and common good rested? Focus groups were also used to test the acceptability of the goals of the new strategy as formulated in draft versions.

These consultations were said to be "broad-based" and the "the centerpiece" of the renewal process but a closer examination reveals that these may not have been as broad based as could be. In the case of sectoral consultations, lead departments contacted a set of stakeholders and asked for their comment on a consultation document. The list of participants was not disclosed on Canadian Biotechnology Strategy Online. In the case of the roundtables, participants were listed in the summary reports. This listing allowed for an evaluation of the inclusiveness of the process.

Roundtable consultations

The Roundtable Consultation Summary Report specified that participants were approached through a "consolidated list of stakeholders prepared by 7 lead departments", the NRC and granting councils. Individuals and organisations on these lists were then classified according to 3 categories: knowledge-based, industry and the larger community.[2] According to the Task Force "recruitment targets for the three groups were

[2] Knowledge based community included "individuals having special expertise in areas such as research and development, technology commercialization and socio-ethical matters." Industry included

met; 37% of those attending were from the knowledge-based category, 40% from industry and 24% from the larger community. In addition, 11 representatives from provincial governments attended the round tables."[3] For comparison purposes, I added participation by the provincial governments to the numbers provided by the Task Force and calculated new percentages using the data provided in the Summary of round table consultations (see table 1). This new total reduces the share of all other categories by three percent.

Table 11. Participation to the round tables by category. Data from the Canadian Biotechnology Task Force's Summary of Round Table Consultations (1998).

	Number attended	Percentage
Industry	51	*37% (40%)*
Knowledge	48	*34%(37%)*
Larger community	29	*21%(24%)*
Provincial governments	11	*8%*
Total	139	

The typology of participants (knowledge, industry and larger community) used by the task force however needed to be examined. Were experts from the industry considered "knowledge" or "industry"? How to classify representatives from associations whose membership was primarily industry but whose official mandate claimed to be the pursuit of the public interest? Should farmers associations be classified as "industry" or "larger community"? How to classify organizations with cross membership (government, industry, experts)? It was not clear how the first two

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"representatives from associations, business people and producers in Canada's primary biotechnology sectors." The larger community included "persons representing the public interest in areas such as ethical and social matters, consumer issues, health and the environment." In Canadian Biotechnology Strategy Task Force. Summary of Round Table Consultations. "Methodology" 21 July 1998, http://biotech.ic.ca/archives/engdoc/bh00224e.html , retrieved 06/09/20.

[3] Canadian Biotechnology Strategy Task Force. Summary of Round Table Consultations. 21 July 1998, "Methodology" http://biotech.ic.ca/archives/engdoc/bh00224e.html , retrieved 06/09/20.

categories (knowledge and industry) were partitioned. For example, was PAPRICAN, the "Institut canadien de recherche sur les pâtes et papiers" funded and administered by the industry, included in the "knowledge" or in the "industry" category? Furthermore, was the membership or the self-proclaimed mandate used to classify organisations such as the National Institute on Nutrition, the National Agriculture Environment Committee, or the Consumer Council of Canada? Were they classified as "industry" because their membership was mostly industries and industry associations? Or were they included as "knowledge" or "larger community" associations because their official mandate was to "improve the marketplace", "promote nutrition" or study environmental questions related to agriculture?

For comparison purposes and to be in a position to draw conclusions about the balance of representation, I used the information contained in the 5 Summary Reports to evaluate the balance of participation (see table 2). Based on the lists of participants, I created and redefined 5 categories: industry, university or academics, provincial governments (including representatives from granting councils), and non-governmental associations. An "unknown" category was used to classify those whose description did not allow the determination of their affiliation with a reasonable degree of certainty. Individuals acting as facilitators or reporters at the round tables, representatives of the CBS task force as well as resource-persons from Health Canada and CFIA were not included in the total. Certain associations had a "cross-membership" composed of two or more of the following categories: government departments, universities, industries and industry associations and farmer's associations. These were then classified according to the group having the highest membership within the given association. Farmer associations were included in the "associations" category. Finally, some individuals participated in more than one round table. Such was the case, for example of BIOTECanada's Joyce Groote who attended each of the five round tables. To make sure this was taken into account, it was the number of participations that was accounted for, not the number of total participants.

This new categorization of participants revealed a different picture. First, the total number of participants in my evaluation was lower than that of the CBS Task Force. A possible explanation was that participants from CFIA, Health Canada and representatives of the Task Force, including the facilitators, for a total of 8 to 9 people at each roundtable, were included in the account made by the Task Force.

In the case of the "larger community", the difference between this new evaluation and the Task Force's account was small. The Task Force reported that the larger community represented about 24% of the total seats during the round tables and this new account showed 22%.

Table 12. Representations at round table consultations using new categories of participants. Data extracted from participant's lists as available in Summary Reports.[4]

Cat.	Halifax		Montreal		Saskatoon		Vancouver		Toronto		Total	
	tot	*%*	tot	*%*	tot	*%*	tot	*%*	tot	*%*	Tot	*%*
I	11	*50*	12	*52*	12	*50*	10	*47*	19	*47*	64	*49*
U	5	*23*	4	*17*	5	*21*	6	*29*	6	*15*	26	*20*
G (P)	3	*13*	1	*4*	1	*4*	1	*5*	3	*8*	9	*7*
A	3	*13*	5	*23*	6	*25*	3	*14*	12	*30*	29	*22*
?	-	-	1	*4*	-	-	1	*5*	-	-	2	*2*
Tot	22		23		24		21		40		130	

I = Industries and industry associations. These include provincial associations for the development and promotion of biotechnology industries such as Ag-West Biotech or BIOTECanada.

U = Universities and academics.

G = Provincial governments and representatives from the NRC and granting councils. While representatives from provincial governments varied from city to city, those of the federal government remained the same, with varying combinations of CFIA's Bart Bilmer and Margaret Kenny and Mary-Ann Kenny of Health Canada. For purposes of comparison and assuming that these participants had the mandate to inform other participants, their participation was not included in the category.

A = Non-governmental organisations whose membership is not mainly constituted of industries, industry associations or of representatives from industries or the government. Farmers' associations were included in this category.

? = Unknown individuals. This category is made of individuals whose description in Summary reports have not allowed their classification with a reasonable degree of certainty.

I chose to modify the "knowledge-based" category to make it a "university-academics" category. This, I thought, would avoid classifying experts working for industries or industry associations in a category that suggested a certain degree of independence. This change made a significant difference in numbers and created a very different portrait of participation. While the Task Force claimed that industry made up to 40% of total participation, my evaluation was that their share was 49%, a 9% difference. Furthermore, using these new criteria, the participation of universities and academics went down to 20% while the Task Force argued that 37% of participants were from the "knowledge" category, a 17% difference. Using the new category that excluded industry experts, numbers in this category went down from 48 representatives to 26

[4] Canadian Biotechnology Strategy Task Force. Summary Reports: Halifax, Montreal, Saskatoon, Vancouver and Toronto. "List of participants". For the Montréal and Vancouver reports respectively; www.strategis.ic.ca/SSG/bh00198e.html and www.strategis.ic.ca/SSG/bh00200e.html, 2 June 1998, retrieved 12/15/1998. For Halifax, Saskatoon and Toronto reports;
http://biotech.ic.gc.ca/archives/engdoc/bh00197e.html 6 May 1998;
http://biotech.ic.gc.ca/archives/engdoc/bh00199e.html, 13 May 1998;
http://biotech.ic.gc.ca/archives/engdoc/bh00201e.html, 2 June 1998, retrieved 06//09/20;

representatives. It thus seems that the "knowledge-based" category used by the Task Force was made of a considerable number of industry-linked scientists.

The imbalance in participation was not neutral. It created situations where a given set of concerns got diluted in a wider set of issues. The choice to tackle the broad question of biotechnologies (without even concentrating on the new biotechnologies) created a situation where a great number of parties were invited to contribute to wide questions in a very short time frame. Industries were already better organised, better financed and better informed. While a representative of BIOTECanada was delegated at each of the 5 consultations, consumers - represented by the very controversial Consumers Association of Canada – were represented at only three of the round tables and only 3 environment defence groups participated. An examination of the participants under the "larger community" or "associations" category illustrates that the consultations fell short in rallying some of the most important actors (Table 3). Consumers, environment defence groups, women and religious groups could not be represented at each of the 5 roundtables. The great diversity of interests grouped in the "association" category also contributed to dilute their concerns. The time frame of the consultations and the choice to tackle general questions simply added to the phenomenon.

Not only was the categorization of participants by the task force giving a biased picture, the task force insisted on assessing the round table consultations in very positive terms. Doubts emitted by the participants about the balance of representation were reported by the Task Force in this single sentence: "Similarly, some concerns were expressed about the limited participation from the larger community (which tended to be most heavily concentrated in Central Canada." In fact, only in Toronto did the level of "larger community" participation reach 25%. Using the categories described above, the Task Force was in a position to affirm that objectives in terms of the participation of the target groups (knowledge based, industry and larger community) were met and satisfactory. Other concerns expressed by the participants such as the "short-lead time and the number and complexity of issues to be addressed in a single day" and the content of the discussion paper – too general to be useful - were reported in one small paragraph that was followed by a statement by the Task Force to the effect that the roundtables were altogether a success: "The round tables provided an opportunity for representatives from a wide cross-section of backgrounds and interests to express their individual concerns, to listen to the views of others and to work together over the course of a single day on a set of common tasks."[5]

[5] Canadian Biotechnology Strategy Task Force, Summary of Round Table Consultations, part titled "Balanced Perspectives," 21 July 1998 http://biotech.ic.ca/archives/engdoc/bh00224e.html, retrieved 06/09/20.

Table 13. Per Sector Participation of Community Associations to the 1998 Roundtable consultations for the Renewal of the Canadian Biotechnology Strategy.

Health (8)	**Consumers(3)**	**Women(4)**
The Roeher Institute Canadian Public Health Association	Consumer Association of Canada (Halifax, British Columbia and the National Food Committee) (3 participations)	Disabled Women's Network
Canadian Hemophilia Society	**Environment(3)**	The Feminist Alliance on Genetics & Reproductive Technology (2X)
Saskatchewan Association of Health Organizations	Saskatchewan Eco Network	Canadian Women's Health Network
National Council on Ethics in Human Research	B.C. Biotechnology Circle	**Religious (2)**
Canadian College of Medical Geneticists	Canadian Institute on Environmental Law and Politics	Canadian Conference of Catholic Bishops
Native Physician s Association in Canada	**Others (4)**	Canadian council of Churches
National Cancer Institute of Canada	Student Pugwash Society	
	Canadian Council on Animal Care	
	East End Food Cooperative Science Teachers	
	Association of Ontario,	