



Introduction



In the mid-1990s, when genetically engineered (GE) seeds were first being planted commercially in North America, the biotechnology industry and its partners envisaged a world in which their crops would be widely accepted as the food of the future, providing a growing population with improved nutrition and farmers with more environmentally sustainable production options (Duvick 1995). To many environmentalists and others, however, the new seeds represented a troubling development. Some critics focused on the way that genetic engineering, along with new interpretations of intellectual property law, reinforced the trend towards oligopolies in the global food system while reducing the ability of farmers to use and save locally adapted seed varieties (Kloppenborg 1988; Shiva 1993). Others raised ethical concerns about the species crosses taking place in the engineering of plants and animals (Kneen 1999). The possibility of food safety and environmental hazards associated with GE organisms (GEOs) was also widely voiced by critics (Rissler and Mellon 1996).



The differences in perspective between the proponents of GEOs and their critics were part of a protracted struggle over the adoption of these organisms in the global agricultural and food system that began with the development of the first genetically engineered plants in the 1980s and continues to this day. This dispute has taken place in a host of fora, including farm meetings, protests against “Frankenfoods” at supermarkets, scientific meetings concerned with assessing the risks of GEOs, World Trade Organization (WTO) deliberations, and the stock exchanges of the world, where investors have had to decide whether or not to gamble on the agbiotech industry.

Although not obvious to observers, one of the issues at the heart of this wide-ranging dispute has been the very definition of the organisms in question. The terms “genetic engineering,” “genetic modification,” “transgenesis,” and “biotechnology” have all featured centrally in the debate, and they are often assumed to carry the same meaning. However, these terms have not

always been defined in the same way, as I explain in detail in later chapters. The use of one term over another has depended on various factors, including perceptions of how risky the new organisms actually are.

Because of the politicized nature of language in this field, it is important that I clarify my choice of terminology before going any farther. I use the terms “genetically engineered organisms” (or the *products* of genetic engineering) and “transgenic organisms” in the way that has become most widely accepted in recent years: these are organisms whose DNA has been purposefully altered in a way that does not occur naturally by mating or natural recombination. I also employ the term “genetically modified organism” (GMO) as a synonym for GEO, but restrict its use to discussions on policy deliberations from which it emerged as a regulatory category. I use “biotechnology” or simply “biotech” as a descriptor for the industry that employs genetic engineering, along with other tools, for agriculture (agbiotech) or other purposes, such as the development of GE pharmaceuticals.

Given the ambitions of the acolytes of genetic engineering for a revolution in global agriculture, their efforts appear to have resulted in mixed success to date. Between 1995 and 2005, the area planted in transgenic seeds grew from a small number of test plots to 90 million hectares (James 2005). This is an enormous achievement for the champions of GE seeds. However, in 2005, 94 percent of the area devoted to these crops was found in only five countries: the United States (55 percent), Argentina (19 percent), Brazil (10 percent), Canada (6 percent), and China (4 percent). Only sixteen other countries were growing GE crops on a commercial basis, with most growing on less than 100,000 hectares (James 2005).

Elsewhere in the world, the dawn of the twenty-first century brought with it a great deal of skepticism towards GEOs. An effective ban existed on the introduction of new GE crops and foods (other than those no longer containing novel DNA) in member states of the European Union (EU) from 1999 to 2004, and bans on specific GEOs remain in place in some EU countries (Pew Initiative on Food and Biotechnology 2005). In 2001, several countries, including Sri Lanka, Croatia, and Bolivia, considered banning engineered organisms altogether. A year later, three African states rejected food aid from the United States because it contains GEOs (Villar 2002; Vint 2002). One outcome of global skepticism towards GEOs is that a number of states, including Japan, Australia, and member states of the EU, developed laws that require the labelling and/or traceability of GEOs from field to plate. Another outcome is that many of the world’s largest food manufacturers, including Coca-Cola and PepsiCo subsidiaries in China, have committed to producing foods without GE ingredients (Greenpeace 2005a). These are all signs that GE crops and foods have not received the global acceptance hoped for by the biotech industry but, instead, face major roadblocks; the revolution remains far from assured.

This book presents an analysis of the global politics of agricultural biotechnology through an in-depth examination of one particular forum that has been a central site of political struggle. This is a forum where the dispute over GEOs took a specific set of twists and turns in the late 1990s and early 2000s that continues to have major implications for politics of agbiotech and related fields today: the negotiation of the Cartagena Protocol on Biosafety.

The Cartagena Protocol on Biosafety

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD) is an international treaty governing trade in living GEOs (known under the protocol as living modified organisms, or LMOs). This treaty is intended to protect the environments of importing countries from GEOs that could harm their environment. For example, a country with salt marshes supporting rare species of wildlife would want to know if a variety of wheat has been genetically engineered to be salt-tolerant, in order to protect against the possibility of the grain successfully invading the wildlife habitat. This protocol allows importing countries to demand such information and to block imports of the GEOs if they deem potential risks too severe or unmanageable, or if there is insufficient scientific knowledge to carry out a satisfactory risk assessment (CBD 2000a). The Cartagena Protocol, which has been ratified (or acceded to) by more than 130 countries, came into effect in September 2003 (CBD 2006a). At the time of this writing, there have been three Conferences of the Parties serving as the Meetings of the Parties to the Protocol (COP-MOPs) to work on its implementation. The first took place in Kuala Lumpur, Malaysia, in 2004. The second meeting was in Montreal, Canada, in 2005, and the third took place in Curitiba, Brazil, in early 2006.

The negotiation of the protocol occurred between 1996 and 2000, although talks actually began as early as 1990, when, in the lead-up to the Rio Earth Summit of 1992, it was proposed that biotechnology be referred to in the CBD. After vigorous debate, the article was included in the final text of that treaty. Among other things, Article 19 of the CBD called on parties to the convention to consider “the need for and modalities of a protocol ... for the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity” (UNEP 1992, Article 19.3). In 1996, following further debate, negotiations to create a protocol to meet these ends were set into motion under the CBD.

From the moment that it was first raised in international policy circles, the idea that the products of biotechnology should be given special attention in international law was strongly contested by countries such as the United States that were developing GEOs for export, and European countries

such as Germany and the UK that saw international biosafety guidelines, rather than legally binding regulations, as the way forward. The call for a protocol was also strongly resisted by biotechnology industry organizations from North America, Europe, and Japan. Opposition from these quarters continued during the negotiation of the Cartagena Protocol. The name given to this protocol refers to the city in Colombia where negotiations were expected to be completed in February 1999. That final negotiations actually took place far from Cartagena, in Montreal almost a full year later, is a testimony to the challenges that faced the states and activist groups advocating strong, legally binding rules to govern trade in GEOs.

At the Cartagena meetings, a group of six nations named the Miami Group and chaired by Canada scuttled the talks at the last minute by stating that the emerging consensus around trade restrictions on LMOs was not in anyone's best interest (Chasek 1999). As late as one o'clock in the morning of 29 January 2000, this was still the position of the United States and Canada, in particular. However, for reasons that I explore in this book, just before five o'clock (CBD 2003, 13), after a night of intense negotiations, Canadian representatives, along with those of the United States and their other allies, gave in to a compromise protocol that they believed was weighted against their domestic biotechnology industry's interests.

The Cartagena Protocol breaks new ground in global environmental politics, and that it was completed and agreed to by international consensus surprised even many of those who participated in its negotiation. As one Canadian official put it,

A large number of countries, like the small island states that never felt that the protocol would come into effect, but wanted it, have been stunned because it is there ... On the other hand, among the larger developed countries, and certainly among the Miami Group, you've got stunned disbelief that it ever came into effect; because they did all of their preparations on the premise that it would never happen. (Interview #1)¹

The Cartagena Protocol is significant on many fronts. Particularly interesting with regards to environmental politics is that this multilateral environmental agreement (MEA) treats an entire class of new and unproven technologies in a *precautionary* manner.

Most multilateral environmental treaties are created in hindsight, after there is clear evidence that certain practices or industrial products, for example, are damaging the environment. By contrast, GEOs are relatively new and the extent to which they represent a serious safety hazard, either to the environment or human health, is still not clear. Furthermore, they have actually been promoted, as one representative of a public-interest civil society organization (CSO) active in the biosafety talks noted, as the "next

economic basis for human existence on the planet” (Interview #2). (Instead of the term non-government organizations, or NGOs, I use the term “civil society organizations,” or CSOs, to refer to all those voluntary organizations that exist between the individual and the state; see Chapter 1 for background on this conceptualization of civil society). That an international regulatory tool was negotiated before the widespread dispersal of genetically engineered organisms, and before clear evidence of the hazards they represent as a class of technologies, speaks to the unique political dynamics of this field.

The rules set out in the Cartagena Protocol for the import and export of these organisms are also unique when it comes to international norms for environmental regulation. The final text includes several clauses that empower states to make precautionary decisions on GEOs. For example, Article 10.6 of the protocol states:

Lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity ... shall not prevent that Party from taking a decision, as appropriate, with regard to the import of the living modified organism. (CBD 2000a)

That the Cartagena Protocol was developed with foresight and that it includes text supporting precautionary import decision making are two significant developments in the field of environmental politics. These developments are widely seen as part of an attempt, at the international level, to operationalize the precautionary principle in the field of genetic engineering.

The precautionary principle, as iterated in the Cartagena Protocol, has its legal origins in the German concept of *Vorsorgeprinzip*, which expresses the belief that society should seek to avoid environmental problems by careful forward-looking planning that blocks the flow of potentially harmful activities (Jordan and O’Riordan 1999, 4). However, precaution as a policy tool is not a German concept only. In the English-speaking world, concepts akin to the precautionary principle are found in such basic health care adages as “First, do no harm” and “An ounce of prevention is worth a pound of cure” (Raffensperger and Tickner 1999, 1). Before its evolution in Germany and then the EU in the 1990s, elements of a precautionary approach could be found in numerous North American laws, including the 1970 US National Environmental Policy Act, which institutionalized environmental impact assessment procedures for federally funded projects (Kleiss 2003).

That the final Cartagena Protocol text contains clauses that operationalize a precautionary approach towards GEOs at the international level – albeit

without mentioning the phrase “precautionary principle” itself – was considered a surprising victory for the environmental CSOs that participated in the talks (Dawkins 2000a). It was a surprising victory, because the biotechnology industry, along with the US and Canadian governments and others, had worked through the 1980s and into the 1990s to establish a very different way of understanding GEOs and how they should be dealt with in regulatory policy. Even though these countries had earlier legal experience with precaution as an overarching approach to environmental issues, by the early 1990s they had chosen to frame most GEOs as minimally risky to the environment and human health, and as *substantially equivalent* to other crops and foods already in the international marketplace. An international protocol designed to allow precautionary decision making on LMO imports is clearly at odds with this equivalency framing.

The creation of an international legal instrument that allows for precautionary action on genetically engineered organisms raises important questions: Why do we have a protocol that singles out LMOs for special regulatory treatment? How were clauses that allow for precautionary decision making on LMOs, in advance of their import, embedded in the Cartagena Protocol on Biosafety? And what does the Biosafety Protocol, with its precautionary clauses, mean for the biotechnology revolution that was expected to change the face of modern agriculture? These questions are the central focus of this book. A secondary focus is on my home country’s – Canada’s – place in the global politics of biosafety.

Canada played an important role in the evolution of the Cartagena Protocol. On the one hand, from its inception in 1992, Canada had been seen as a key supporter of the Convention on Biological Diversity. As evidence of this relationship, Montreal was appointed as the home of the secretariat for the convention at the first Conference of the Parties to the CBD (COP-1) in 1995. On the other hand, in the late 1990s and early 2000s, Canada was third only to the United States and Argentina in the uptake of genetically engineered seeds in agricultural production (James 2001). Because of a perceived domestic economic interest in exporting GE crops grown in this country, combined with a grain trader’s fears that even shipments with minimal GE content might be caught in new regulatory nets enabled by a strong protocol, Canada chaired the Miami Group. This negotiating group sought to minimize the potential impact of the protocol on the international grain trade. By taking this stance, many countries and activists felt that Canada had shifted from being a strong supporter of the CBD to being one of the principle opponents of a protocol negotiated under the auspices of that very convention. Such suspicions were apparently verified when Canada’s position on biosafety, along with those of other Miami Group countries, was instrumental in precipitating the collapse of the talks in Cartagena in 1999.

Fortunately, the episode in Cartagena did not represent the end of the biosafety talks, and a similar collapse did not take place in January 2000 in Montreal. How did Canada justify its stances on biosafety in both Cartagena and Montreal, given its seemingly divided interests in the issue? Why was the compromise reached in Montreal acceptable to representatives of the Canadian government, along with other GEO-exporting countries, when a compromise had evidently not been possible a year earlier? And what, if anything, does the new precautionary treaty mean for the politics of GEO use in Canadian agriculture?

To address the two sets of questions raised above on the development and implications of a precautionary Cartagena Protocol in general and on the Canadian place in global GE politics, one needs to have a sense of where to begin looking for answers. This is where political theory offers direction. A theoretical framework helps illuminate certain features of the political landscape for scrutiny, although inevitably backgrounding others. The problem is that the adoption of one theoretical lens over another, or even a hybrid among several, involves a bit of a chicken-and-egg conundrum: in choosing what to focus on, one must have already made some educated guesses about which features of the political landscape could benefit from illumination.

Theory

My initial investigations into this field suggested that there were at least three factors at play in the politics of GEO regulation and trade. First, economic interests, such as Canada's interests as a wheat and canola exporter, looked to be important in shaping a national position on GEO trade. The position of most other countries of the world as primarily GEO importers in the mid-1990s, which entailed a different set of economic interests, appeared to be equally relevant to their domestic policies on GEO trade. However, economic interests on their own did not appear sufficient to explain GEO policies. If GEOs were inherently risky for human health and the environment, as some activists were suggesting, the Canadian government would have a hard time justifying commercial production, let alone export, of these products. Conversely, if there were no grounds upon which the safety of GEOs could be called into question, any movement to limit their trade would never have reached the proportions it had. So scientific knowledge, and its interpretation by the public and politicians, appeared to be a second factor influencing GEO policies. A third factor also came to the fore: cultural values, and their definition in institutions and norms of regulation, appeared to play an important role in the politics of GEO trade. This factor surfaced in the differences emerging between Europe and North America in the late 1990s on how to regulate the exact same GE foods.

Before beginning this research, then, I knew that policies on GEOs were likely influenced by at least these three factors: scientific knowledge, economic interests, and norms of governance. To understand the internationalization of agricultural biotechnology and its regulation, I would want to draw on a theoretical tradition, or traditions, that would help me examine, at a minimum, how these three factors interacted at the global level.

I first looked to the international relations literature. The dominant theoretical tradition in this field for examining environmental issues, neo-institutionalist regime theory, focuses on the international dynamics of establishing global regulatory rules and norms. Regime theory did prove useful, for example, in interpreting the influence of already established norms of governance on subsequent international institutions. However, as I explain in Chapter 1, I found this approach wanting in many other ways. Regime theory was particularly weak when it came to theorizing the relationships between knowledge and interests in establishing regulatory norms in the first place. In contrast, I found those scholars who had the most to offer on the relationships between interests, knowledge, and norms drew either on the theoretical insights of Antonio Gramsci (1891-1937) or Michel Foucault (1926-84) in their work.

One example of scholarship that draws on the work of Gramsci is Purdue's study of biotechnology and the global institutionalization of new norms of intellectual property rights to living materials through the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement of the WTO (Purdue 1995). A second example is the work of Levy and Egan (2003), who develop Gramscian concepts for the purpose of examining the way that corporations and other political actors interacted in the formation of the international climate change regime. Of the many political scientists who work with Foucault's ideas, Wright and Litfin's studies were particularly inspiring. Wright (1994) looks at the relations of power that led to the creation of American and British regulatory policies for genetic engineering in the 1970s and early 1980s, while Litfin (1994) examines the way that the Montreal Protocol on Substances That Deplete the Ozone Layer came into existence amid divergent understandings of the ozone-depletion problem, competing commercial interests, and a range of possible regulatory responses. These studies and others provided guidance as I developed my own hybrid theoretical approach to the politics of biosafety, rooted in the theories of Gramsci and Foucault.

Both Gramsci and Foucault offer political philosophies that appear daunting to the uninitiated. However, the reward of being able to illuminate contemporary problems through concepts they introduced makes up for the challenges presented by their texts. This is why in Chapter 1 I go into some depth in explaining, as accessibly as I can, the contributions of both theorists to understanding environmental politics. In general terms, Gramsci

and Foucault are useful to a study of the global politics of agricultural biotechnology and the environment because both of these thinkers are highly attuned to the power of ideas in politics, and clearly it was ideas – whether ideas about the economic importance (or threat) of GEOs, ideas about the nature and risks of GEOs, or ideas about how to govern such risks – that I had first set out to examine in order to shed light on the politics of biosafety. Equally important, both theorists are interested in the way that ideas, whether conceptualized as ideologies or discourses, are embedded *within* social relations. To put it simply, both argue that ideas don't just appear out of thin air; they arise from, are acted upon in, and help give shape to specific material, social, and political arrangements. While there are significant differences between Gramsci and Foucault, together these two thinkers offer a variety of tools for interpreting the way that knowledge, interests, and norms (along with other factors) helped shape the Cartagena Protocol, and how this protocol, in turn, has affected the wider politics of genetic engineering and the environment.

Gramsci's specific contributions to this work include his notions of "hegemony" and "historical bloc." While each of these concepts is distinctive, their commonality is that they were formulated to describe relations of power that are reinforced across different areas of social and political engagement, particularly the realms of material capabilities (including economic forces), organizations (including institutions), and ideas. I use these two concepts to help elucidate the formidable relationships among the biotechnology industry, governments, and civil society that formed around the biotechnology revolution in its North American heartland, and to illustrate the various levels on which these relationships had to take hold in order to be successful.

Foucault's contributions to this work include his theorization of power and resistance in "discourse," as well as the political dynamics of "governmentality" and "biopower." Most simply, "discourses" refer to ingrained (yet always still contested) patterns of thought and action, and the power that accompanies these normalized patterns for defining possible futures. "Governmentality" indicates a specific set of discourses regarding the practice of modern governance, while "biopower" refers to the particular forms that governance of people and other living beings have taken in the industrialized West over the past two centuries or so.

I develop each of these three concepts in the early chapters of this book to help me dig more deeply into the assumptions and practices that underlie debates over the risks of genetic engineering than mainstream approaches to international relations would allow. Notably, the works of both Gramsci and Foucault exemplify the importance of grounding political theory in historical, real-world struggles and in day-to-day relations of power. In retrospect, it is clear that this was the approach I had adopted in this research.

Synopsis

The argument I develop through the six empirical chapters of this book is that the Cartagena Protocol on Biosafety was enabled by, and further embedded, an emergent discourse of precaution in the field of agricultural biotechnology at the international level in the late 1990s and early 2000s. This precautionary discourse is gradually supplanting the discourse of “risk” in international policy fora, the discourse that had been promoted by the proponents of genetically engineered organisms since the early 1980s. The risk discourse holds that the potential harms of GEOs could be easily characterized and calculated, and that any hazards associated with GEOs could be easily managed. Because the precautionary discourse presupposes that the risks of GEOs are not necessarily easily understood and managed, the institutionalization of this alternate framing of GEOs at the international level occurred in the face of stiff resistance from countries such as Canada and the United States that had become, through the 1980s and 1990s, deeply enmeshed in the biotech revolution led by the agri-chemical industry. That these countries assented to the Cartagena Protocol in 2000 represented a major concession by proponents of genetic engineering towards their critics, a concession that continues to have impacts on the biotech revolution in agriculture and in other areas of environmental governance.

At the same time, it is important to recognize that a precautionary approach to GEO governance, in terms of day-to-day regulatory practice, is not yet universally accepted as the norm. The positions of the US, Canadian, and Argentine governments in their 2003 WTO trade dispute demonstrates the continued existence of the risk framing of GEOs (although one that has subtly shifted from the position those countries might have taken three years earlier, as I explain in Chapter 7) (WTO 2006). It is also important to recognize that a precautionary protocol was not simply a victory for the critics of GEOs; the institutionalization of “precaution” in the Cartagena Protocol came at a price.

Following Foucault’s characterization of discourse, the precautionary discourse can be understood as a dispersed set of practices and truth claims about genetic engineering, and about how GEOs should be dealt with in governmental regulation and by industry, that is grounded in a particular social and political context. As a discourse, precaution does reflect the precautionary principle in that it reinforces practices designed to anticipate, assess, and prevent problems that may be caused by GEOs in the environment, even when full scientific evidence of those harms may be lacking. But the way precaution is framed in the Cartagena Protocol has other productive effects, not all of which sit as well with critics of GEOs. Consider the following three examples. First, given its origins in the earlier risk discourse, many of the actors operating within the precautionary discourse still assume that eventually all environmental risks will be predictable and

manageable. Although a large number of GEO critics who argued for a precautionary response to GEOs in the protocol negotiations would challenge these assumptions, the precautionary elements of the Cartagena Protocol text do not clearly back one side or the other on this issue. Second, the precautionary discourse institutionalized in the Cartagena Protocol does not appear to accept the notion that the full range of potential ethical, environmental, human health, social, and economic implications of GEOs ought to be part of precautionary decision making, even though many of the initial advocates of precaution saw these as fundamentally interrelated risks of genetic engineering. Third, because of the protocol's relationship to international trade agreements, its iteration of precaution must be seen to uphold the view that proactive actions taken to prevent harm in the face of uncertainty must still represent the "least trade restrictive" option, along with conforming to other standards of trade law. Among its repercussions, this framing rules out blanket bans on GEOs on the basis of precaution such as that enacted in Upper Austria in 2003 (Anonymous 2005b).

Emerging from earlier debates about the hazards, risks, and uncertainties of genetic engineering, this specific precautionary response to the genetic engineering issue crystallized during the late 1990s as a compromise among divergent ways of framing the genetic engineering issue. The negotiation of the Cartagena Protocol was the focal point of this process. As a result, I term this particular regulatory narrative the "Cartagena" discourse of precaution.

What is interesting about the negotiation of the Cartagena Protocol is that here the precautionary response was not simply a force coming from outside the negotiations to shape perceptions of the issue, as Litfin (1994) sees precautionary discourse in relation to the international negotiations on ozone depletion. In this case, precaution entered the debate as a way of framing the issue on the part of certain key actors and, eventually, the widespread adoption of this discourse resulted in a critical shift in the negotiation dynamic by late 1999 and early 2000. At the same time, however, many of the elements of the Cartagena discourse of precaution – a discourse that by now has had wide-ranging effects even outside the realm of GEOs – were actually shaped through the negotiation process among representatives from nation-states and civil society. While it is true that by Foucault's definition discourse is necessarily the product of political struggle and negotiation through the medium of language, it is rare that one can actually trace the micro-politics of discourse formation through the positions and counter-positions taken in a specific conversation, and that one can relate these shifting positions to domestic political struggles as well as to the dynamics internal to government and intergovernmental relations.

Chapters 1 through 6 are the result of a fine-grained analysis of biosafety protocol negotiation documents and other policy documents, as well as interviews and first-hand written accounts of the negotiations. I also draw

on previous studies of the politics of agricultural biotechnology. I am particularly indebted to Charles (2001) for his book *Lords of the Harvest*, to Krimsky (1991) for *Biotechnics and Society*, to Wright (1994) for her monograph *Molecular Politics*, and to Gupta's (1999, 2000a, 2000b, and 2000c) research on the Cartagena Protocol.

I undertook twenty-six interviews for this book, most between one and two hours long. I also sifted through more than sixty first-hand accounts of the Cartagena Protocol's negotiation. The majority of these can be found in an excellent anthology that features chapters written by participants in the biosafety negotiations edited by Bail, Falkner, and Marquard (2002). I have treated these written accounts in much the same way as my interviews, since they represent first-hand (as well as politicized and often contradictory) memoirs of the negotiation process. Most of the interviews, along with the chapters in the Bail, Falkner, and Marquard volume, were written or recorded within the first two-and-a-half years after the Cartagena Protocol's negotiation, rather than at the time of the negotiation itself.

Political theorists recognize that discursive politics can be fully appreciated only at the micro-analytical level (Darier 1999). At the same time, Gramsci and Foucault would argue that the researcher must also be aware of the larger historical webs within which these details are situated. In an attempt to achieve both of these ends, I trace the micro-politics of biosafety in the context of macro-trends in the field of biotechnology and environmental governance.

Chapter 1 lays out the theoretical framework adopted in this study. I begin by considering the strengths and limitations of mainstream approaches to international relations. I then explain how I employ Gramscian and Foucauldian concepts in this study of the politics of agbiotech.

Chapters 2 and 3 present an overview of the global politics of agricultural biotechnology in the 1980s and 1990s and are organized by the Gramscian conceptualization of politics as involving three sets of relations of force: the material, organizational, and ideational. Chapter 2 highlights activities in the material and organizational arenas. Drawing largely on Canadian examples, it documents the emergence of what I call the "biotech bloc" within the agriculture and food system. This historical bloc, which first coalesced in the late 1970s and early 1980s, involves a set of alliances among molecular biologists, agri-chemical corporations, and the US, Canadian, and Argentine governments. These actors had all set their sights on the genetic engineering revolution in agriculture and worked together, over the ensuing decades, to make this global revolution a reality.

Chapter 3 presents a detailed examination of the ideational politics of biotechnology and its regulation. In this chapter, I trace the way that four particular sets of ideas organize the politics of agricultural biotechnology.

These are ideas of the gene, the environment, liberalism, and risk. I begin by examining each idea independently and then turn to consider where they intersect, with attention to the ways that they shaped, through the late 1980s and early 1990s, specific debates about the regulation of the hazards and risks associated with the products of genetic engineering. In Canada, the risk discourse was mobilized in limited regulatory overviews that allowed authorities to approve the commercial introduction of plants with novel traits to the environment while also ensuring the public that these plants had undergone comprehensive assessments of their risks. In the EU and several other jurisdictions, however, more complex understandings of the possible risks of genetically modified organisms led to slightly different regulatory systems that would eventually create the space for an alternate discourse of regulation rooted in precaution.

Chapters 4 through 6 trace the development of the biosafety issue and the subsequent negotiation of a protocol on biosafety under the CBD. These chapters tell the story of the gradual emergence, mobilization, and entrenchment of the discourse of precaution in the field of genetic engineering through this international regulatory instrument, and the material, organizational, and ideational dynamics that made this possible. I argue that the institutionalization of this emergent discourse took place over four distinctive discursive shifts. These shifts were actively spearheaded by the leadership of specific GEO critics from both the North and the South but depended on the confluence of various forces to be realized.

The first discursive moment took place during the meetings of the Intergovernmental Negotiating Committee for a Convention on Biological Diversity (INCCBD) in the late 1980s and early 1990s. During this period, biosafety came to be defined as an issue worthy of specific attention by the CBD. A second moment occurred between late 1994 and early 1995, when it came to be accepted that a biosafety instrument would focus narrowly on GEOs, and not on a wider class of "novel" organisms that could include those produced through traditional breeding. These developments were soon followed by the third moment: the acceptance that the field of biosafety required a legally binding international regulatory framework, rather than a voluntary one. The final discursive moment occurred between late 1998 and early 2000, towards the end of the protocol negotiations. This is when the operational language of the Cartagena Protocol came to reflect the specific precautionary framing of biosafety outlined above. The first three discursive moments are discussed in Chapter 4, while the final one is the subject of Chapters 5 and 6.

Chapters 5 and 6 discuss those aspects of the Cartagena Protocol negotiations that are most relevant to demonstrating the evolution and impact of the discourse of precaution through these talks. These include the debates

about the definition of “living modified organisms” and the role of advance informed agreement, risk assessment, and scientific uncertainty, as well as socio-economic considerations in LMO import decisions. I also discuss the creation of separate import procedures and documentation requirements for bulk shipments of living GEOs for food, feed, or processing, as well as the debates over the relationship between the protocol and other international agreements. (These chapters do not cover all aspects of the protocol’s negotiation. For example, compliance issues and debates over liability and redress, as important as they are to the future of the protocol, are not addressed. Readers seeking a negotiating history of the entire Cartagena Protocol should consult Mackenzie et al. 2003 and CBD 2003.)

Chapter 5 begins with an examination of initial positions on the central issues related to the emergence of a precautionary protocol held by key negotiating groups, demonstrating how those positions emerged in the context of material, institutional, and ideational relations of force. The latter half of the chapter focuses on the development of the Canadian position, showing how it was shaped by domestic factors and by Canada’s chairing of the Miami Group from 1998 to 2000. Chapter 6 follows the key debates through the final stages of negotiation, from Cartagena in February 1999 to Montreal in January 2000, showing how each of these issues was concluded in the final text.

Chapter 7 examines the implications of the Cartagena Protocol, with its precautionary framing, for the politics of agricultural biotechnology, and environmental politics more broadly, from 2000 to 2006. I pay attention to both international and Canadian implications. This chapter also examines how the protocol has evolved in the first three years since its implementation, including in particular the evolution of the debate over documentation requirements for bulk shipments of living GEOs. The book concludes with observations on the implications of this empirical study for the theoretical framework employed.

A great deal has been written on the benefits and drawbacks, real and potential, of genetically engineered crops for both the North and the South. While this literature informs my work, the intention here is not to summarize what others have written. Rather, this book examines where genetically engineered organisms have come from, how they came to assume a major position in the global agricultural system, and how political institutions, first in the United States and Canada, and eventually internationally, came to respond to these new technologies in ways that may be as unique as the modified organisms themselves.



1 Theorizing International Environmental Diplomacy

Regime Theory and Its Limitations

How does one begin to assess an international agreement such as the Cartagena Protocol on Biosafety? Most political scientists turn to neo-institutionalist regime theory to help make sense of multilateral environmental treaty making and its implications. Neo-institutionalists are interested in investigating the forms of cooperation that arise among nation-states in an increasingly interdependent global political and economic order. In the context of transborder environmental issues, this cooperation is evident in the development of new environmental regimes. Some scholars define regimes narrowly as a set of norms or rules specified by a multilateral legal instrument (Porter and Brown 1996, 20). However, it is more common to see the concept defined broadly to encompass, as Levy and his colleagues (1995, 274) put it, a set of “principles, norms, rules, decision-making procedures and programs that govern the interaction of actors in specific issue areas.” Significantly, this broader definition sees a regime as more than an institution: it is a form of governance as well as a common set of understandings of a problem and how it is best solved. This definition also does not restrict the development and administration of environmental regimes to the actions of nation-states. As Levy and Newell (2002, 85) point out, regimes are theorized to comprise “networks of actors, routines, principles, and rules, simultaneously constituting and disciplining their subjects, constraining and enabling patterns of behavior.” Neo-institutionalist research tends to focus on the ways in which regimes take shape in the context of interstate politics, how they evolve, and how they influence one another and the actions of nation-states (e.g., O. Young 1997, 2002; Oberthür 2001). There is also a growing literature attempting to assess the effectiveness of international regimes.

Regimes are not restricted to norms and routines that have been formally institutionalized at the international level. In theory, then, regime analysts should be interested in the norms of environmental governance that emerged

in industrial and state practice in various parts of the world before these become codified in international law. In practice, however, researchers in this field tend to focus on formal multilateral environmental agreements (MEAs), possibly because these MEAs provide tidy case studies of truly global environmental regimes (e.g., Haas, Keohane, and Levy 1993; O. Young 2001; Mitchell 2002; and Hovi, Sprinz, and Underdal 2003).

Regime theory provides a useful starting point for an analysis of the Cartagena Protocol on Biosafety. This approach draws our attention to the role of international institutions, such as the United Nations Environment Programme (UNEP), the Convention on Biological Diversity, and their advisory bodies, in structuring the international GE regulatory agenda around the question of biosafety. Another important thread in neo-institutional writings on environmental MEAs examines the role of science in regime formation; this thread is also clearly relevant here. In the case of the Cartagena Protocol, scientific assessments of the GE issue were important in the generation of shared perspectives on this issue, and regime theorists such as Haas (1992) would encourage inquiry into the scientific debates over GEOs during the Cartagena Protocol negotiations to see whether and how shared understandings emerged. Despite these insights, however, neo-institutionalist writings on regimes have several limitations which are by now well recognized in the literature (for a review of some of the key limitations of regime theory, see Newell 2005). These limitations suggest the need for a more complex theoretical framework.

One key limitation of regime theory is the tendency of researchers in this field to focus narrowly on nation-states as the primary actors in global politics. This approach can lead one to lose sight of the political dynamics at the domestic and sectoral levels, where many of the issues and ideas that come to be contested internationally are first defined and shaped. In terms of the politics of agbiotech, in which consumer boycotts, scientific controversies, and industry product strategies can each be seen to be as important as state actions in defining the political terrain, a state-centred political theory is clearly misleading. In response to this issue, one current of thought in the regime literature has focused its attention on the role of non-governmental organizations (NGOs) in environmental politics. NGOs are variously defined to include a range of organizations, from the grassroots level to the international, engaged in advocacy on social and environmental issues (for an overview, see Betsill and Corell 2001). In keeping with the general orientation of regime theory, however, much of this literature remains trained on how NGOs contribute to international environmental policy-making processes. Betsill and Corell, for example, have developed a method for systematically measuring NGO "influence" in MEA negotiations (Betsill and Corell 2001; Corell and Betsill 2001). Although such methods offer useful tools, they

help reinforce the assumption that interstate relations (and the influence of other actors on them) are at the centre of global environmental politics.

Some analysts have tried to break with this assumption by focusing their attention on the theatre of “world civic politics” (a term introduced by Lipshutz) or “global civil society” (Wapner’s preferred term) (Lipshutz 1996; Wapner 1996). For example, Wapner (1996) argues that transnational environmental activist groups work to bring about change at the level of civil society (in terms of building alternative international institutions, consciousness raising, and impacts on consumer behaviour) as much as at the level of international policy making, and that there needs to be more attention given to the effects of these activities on the production of international environmental norms and practices. Jasanoff (1997, 579) has made a similar case about the work of NGOs at multiple levels in global environmental politics, from the provision of local knowledge to policy formulation, implementation, and technology transfer.

In general, the growing attention focused on environmental advocacy groups is important. The insights of Corell, Betsill, Jasanoff, and Wapner, among others, are particularly helpful when trying to understand the role of organizations such as Greenpeace, for example, in international biotech politics both inside and outside the negotiation of MEAs. Furthermore, the terminology employed by Wapner, in particular, suggests an important conceptual shift that I believe needs to be further developed.

As noted, the term NGO (which has its origins in UN parlance) is vague and used to refer to a wide range of groups active in environmental politics. Unfortunately, it is clear that many researchers who employ this term in the environmental politics literature are actually referring to a fairly narrow class of international environmental advocacy organizations – implicitly excluding many other organizations that are not environmentally oriented (such as faith-based organizations) or that have other agendas (e.g., educational institutions, community service clubs, trade organizations). Because these other organizations also play a strong role in determining the norms and values of a society, whether actively involved in shaping environmental policy or not, it is important to make room for them in any broadening of the conceptual terrain of global environmental politics. For these reasons (in addition to the fit with a Gramscian understanding of politics), instead of the term “NGO,” I adopt the descriptor of “civil society organization” (CSO) to refer to any of a wide range of organizations, rooted in voluntary participation, that function between the individual and the state. At the same time, I frequently qualify this term with the addition of an adjective, as in “industry” CSO or “environmentalist” CSO, to give a clearer sense of where specific CSOs are located in material and/or ideological terms.

Wapner's work, along with that of other researchers interested in the global impacts of environmental CSOs, offers an important contribution to a more comprehensive framing of environmental politics. In general, however, this approach to conceptualizing politics beyond the state has taken only one step where there remain others to be taken. In his move to document the activities of organizations such as Greenpeace, for example, Wapner sidesteps the disquieting fact that such advocacy groups may be particularly active on fronts other than international policy making because the official fora of international politics are all too often hijacked by business interests. In my view, Wapner is not really taking the bull by the horns. To do so would be to see that what is ultimately required is a wider, more historicist framing of global political dynamics.

In the environmental politics literature, those scholars most likely to attempt to contextualize interstate politics within broader social, economic, and political relationships tend to work within the historical materialist tradition of international political economy, and many draw, in particular, on the theoretical works of Gramsci (e.g., Purdue 1995; D. Humphreys 1996; Levy and Egan 2003). Gramscian historical materialism has its origins in Marxism and, like Marxism, sees social and political relationships as historically situated within class struggles over production. This approach differs from other strands of Marxism (which Gramsci terms "economism") in that it begins with Gramsci's insight that economic or technological circumstances do not themselves produce change, "they simply create a terrain more favorable to the dissemination of certain modes of thought, and certain ways of posing and resolving questions involving the entire subsequent development of national life" (Gramsci 1971, 184).¹ The actual path taken from technological innovation to political transformation is far from linear and predictable. Yet, Gramsci proposes, this path can be analyzed with the appropriate theoretical tools.

In the context of a study of genetic engineering politics, the Gramscian approach would suggest that while the advent of the techniques of genetic engineering provided new possibilities for agriculture, the biotechnology revolution that has been taking place in agriculture over the last twenty years is necessarily dependent on a host of supportive shifts across civil society, states, and the global order in order to become widespread and accepted as the new norm. Like that of Wapner, this approach emphasizes the centrality of civil society in politics, but Gramscians go beyond activist CSOs to consider a broader range of civil society actors. Like neo-institutionalists, Gramscians see the organization of state and interstate institutions as a critical form of political activity. However, this activity is conceptualized as being only one of three sets of "relations of force," the other two being the material and the ideational (Gramsci 1971, 181-84).

A second key limitation of regime theory is the epistemological stance found in neo-institutionalist writings. Like economic Marxists, most regime theorists are objectivist: a state's (or any other actor's) interests are assumed to be rooted in its material capabilities and/or position in the international system. This assumption is particularly problematic in the field of environmental politics, where actors develop their positions in relation to how they understand the issues at hand.

Haas' work on the role of science in environmental politics has contributed to a rethinking of objectivism in the neo-institutionalist literature. His studies of the Mediterranean Action Plan and the politics of ozone depletion and climate change all suggest that the international political consensus that develops around certain environmental regimes can be directly correlated to the development of scientific consensus on the issue among technical experts from the negotiating states – the “epistemic community” (Haas 1989, 1992). Although this approach is an important contribution, its weakness, as identified by Litfin (1994, 4), is that it still views scientific knowledge as somehow outside politics: knowledge remains divorced from power. A more comprehensive approach would recognize the importance of subjective perceptions of environmental issues in the formation of regimes while also acknowledging that these perceptions, and the scientific knowledge upon which they may be based, are themselves produced within power relations and reflect these origins in one way or another.

On this issue, the literature suggests at least two possible avenues for exploration. The Gramscian approach proposes that ways of understanding the world are actively produced within class relations in order to build and maintain consent for those relationships (or to challenge them). From this perspective, knowledge – including scientific knowledge – is both produced and productive within relationships that have material, ideational, and institutional dimensions. Another possibility is to pursue a Foucauldian analysis of knowledge as discourse, that is, as a system of interwoven truth claims embedded in social relations and material practices. This discursive approach is suggested by Litfin in her critique of Haas. Litfin (1994, 4) illustrates the way that an understanding of discursive power is applicable to controversies involving the interface between policy and the natural sciences. She notes that in such controversies, scientific knowledge is never simply a body of concrete and objective facts; it is deeply implicated in questions of framing and interpretation, and these are shaped in relation to perceived interests.

Scientific discourses are enormously powerful in the contemporary global order because it is within these webs of knowledge that most of us define ourselves and our world. With the politics of GEOs, we can see that “facts” that originated within the scientific disciplines of molecular biology

and ecology, in particular, have played a central role in political struggles over agbiotech. A Foucauldian approach would draw our attention to this phenomenon, focusing on the productive effects of discourses of genetic engineering and the forms of resistance that emerge in this context.

In sum, while regime theory offers a useful starting point, it does not pay enough attention to the complex relationships among the full cast of actors, material forces, and ideas that together shape an MEA such as the Cartagena Protocol. However, this discussion suggests that Gramsci and Foucault have a great deal to offer analyses of global environmental politics.

Gramsci's Relations of Force

At the centre of Gramsci's approach are his theories of hegemony, historical blocs, relations of force, and organic intellectuals. Mainstream international relations scholars look at hegemony in the international arena in terms of dominant states that guarantee regimes through economic or military power over others, or through the provision of public goods. For theorists who draw on Gramsci's work, such as Gill and Law (1989), global hegemony is never seen as having been achieved solely by a nation-state, narrowly construed, because hegemony must be achieved, first and foremost, in the sphere of civil society. Drawing on Hegel, Gramsci sees civil society as the arena of social engagement that exists above the individual and below the state, in and through which individuals form political identities. Murphy (1994, 31) calls civil society the realm where "I" becomes "we." It is in civil society that a leading class, or class fraction, initially constructs the values, programs, and ideologies that represent its own interests as the interests and values of society as a whole. (While many Gramscians see classes as being formed in relation to production, like structural Marxism, others emphasize the subjective dimensions of class formation in relation to ideas [Hall 1988]. I favour this latter interpretation, which allows for recognition of other types of identity-based social actors, such as social movements. These are not necessarily reducible to their position in the relations of production.) These ideologies allow for the building of alliances with other classes, political parties, social movements, important arms of governments, and so on. When the interests of these different actors and institutions converge on a strategic and coherent set of ideas, Gramsci uses the descriptor "historical bloc" (Gill and Law 1989). It is an historical bloc, in this view, and not simply the nation-state, that attempts to consolidate global hegemony.

An historical bloc is made possible when there is a convergence of the three sets of relations of force: first, the material forces of production; second, the relations of political forces through which the interests of one class fraction come to be accepted across that class, and eventually as the common interest of society in general; and third, the relations of military forces and other coercive actions taken by governmental institutions

(Gramsci 1971, 181-84). Those who want to change the status quo, as well as those who wish to preserve it, must develop strategies in each of these arenas of political activity as they engage in “wars of position” designed to gain influence across civil and political society (which, taken together, Gramsci characterizes as the “extended state”). This emphasis on three distinct sets of relations of force is tied with Gramsci’s observation that hegemony is dependent on both coercion and consent. Coercion may be exercised by the state or other institutions, while consent takes place in the realm of ideas.

Gramsci (1971, 350) stresses that the construction of consent involves an educational effort:

Every relationship of “hegemony” is necessarily an educational relationship and occurs not only within the nation, between the various forces of which the nation is composed, but in the international and world-wide field, between complexes of national and continental civilizations.

He terms “organic intellectuals” those individuals and groups, emerging from an historical bloc, who educate society on the need for change. The work of these agents involves framing transformations in a way that makes sense to the public at large. This work is necessary because people are rarely simply blind followers; as Rupert (1995, 26) puts it, they actively constitute their own internal relations with society and nature. The goal of hegemony formation is “to transcend a particular form of common sense and to create another which [is] closer in conception of the world of the leading group” (Gramsci 1971, 423). This effort to reshape common sense involves the introduction of a more homogenous, coherent, and systematic philosophy or “ideology,” with ideology defined not as a necessary product of material structures but as a set of ideas that serves to cement and unify activities across law, economic activity, art, and so on (Gramsci 1971, 348, 420, 331).

Contemporary political analysts have worked with Gramsci’s ideas in at least two distinct ways. Cox (1996), on the one hand, argues that global transformations in the political economy can be seen to depend on congruence among material capabilities, ideas, and institutions across the levels of civil society, state, and world order. Neo-liberal globalization, as such a global transformation, can be seen to be associated with the ascendancy of a new historical bloc since the early 1970s (Gill 1998). This “transnational historical bloc” is centred in countries belonging to the Organisation for Economic Co-operation and Development (OECD), and is led by the transnational capitalist class. At its material foundations, this class fraction is associated with the growing importance of the high technology and service sectors of the global economy, as well as with the increased power of

internationally mobile financial capital. In the ideological and institutional realms, the work of international institutions such as the OECD and the World Bank, and of planning groups such as the Trilateral Commission and the World Economic Forum, have been key to the universalization and consensual adoption of neo-liberal ideology across many sectors of society. Meanwhile, the WTO has emerged as the key coercive vehicle for transnational capital and its most willing state partner, the United States.

Levy and Egan (2003), on the other hand, show how Gramsci's ideas are useful for the study of corporate behaviour in a particular sector and issue area, such as the activities of US oil and automobile industries in response to international climate change negotiations. They liken efforts to establish hegemony to field stabilization within institutional theory. In an interpretation of Gramsci's relations of force suited to this scale, they note that hegemony within a given field requires supportive economic systems of production (including product and industrial strategies), organizational capacity (including links with other sectors, governments, and civil society), and discursive structures (to guide behaviour and lend legitimacy to activities). This analysis of the micro-politics of hegemony formation underscores the notion that effective hegemony necessarily involves compromise and accommodation on the part of leaders in order to generate consent from other participants in the bloc and in civil society more broadly. The resultant historical blocs are contingent and unstable, prone to change both from outside and from within.

Both the macro-level approach of Cox and Gill and the field-level analysis developed by Levy and Egan are consistent with Gramsci's framework. The differences in scale found in these two interpretations may be because of ambiguities in Gramsci's own writings on historical blocs. As Levy and Newell (2002) point out, Gramsci uses this term in two ways. It is sometimes used to refer to the alliances that come to be formed among social forces in each of the three political arenas in order to move a particular agenda of change forward. In other places, "historical bloc" describes the ultimate objective of these efforts: the complete alignment of material, organizational, and discursive formations that stabilize and reproduce relations of production and meaning.

Gramsci also uses his concept of hegemony in two distinct ways. In some cases, hegemony refers to the ability of a class fraction, through the active building of consent, to "gain the upper hand, to propagate itself throughout society" at the level of political forces, which he refers to as the level of the "ethico-political" (Gramsci 1971, 181). Elsewhere, he stresses that hegemony cannot exist simply as a relation of cultural or ideological influence: "It must also be economic, must necessarily be based on the decisive function exercised by the leading group in the decisive nucleus of economic activity" (Gramsci 1971, 211-12). These apparent contradictions in Gramsci's

concepts do not take away from their theoretical value. Rather, they emphasize the close interrelationships that exist among all three sets of relations of force in order for a change to become widespread. Hegemony is necessarily ethico-political, but it cannot be only that, especially not if a bloc that is working to establish its new conception of the good as the common good in a particular field hopes to entrench this view among all the important arms of the economy, civil society, state, and international order. And, only when this goal is reached will we see the emergence of a truly historical bloc that can reproduce and extend its own capacities.

International political economists working within the Gramscian theoretical framework emphasize the necessity of supportive ideas in the formation of hegemony at the international level. The focus in such work is on the way that ideologies are established to structure a political field in line with the interests of a group of actors, on how they are mobilized as resources by actors in global politics, and on how they act as a mooring around which otherwise disparate classes and groups achieve consensus on a common purpose. Ideologies, according to this Gramscian framing, are *embedded* in social relations, and strategically *employed* to generate consensus around a particular group's interests. These insights of Gramsci and his interlocutors regarding the function of ideologies are important, and the case of international biotech politics presented in subsequent chapters illustrates how ideas do indeed function in these ways. Foucault adds further depth to Gramsci's theorization of the formation and impact of ideas, by elaborating on the *discursive* power of ideas.

Foucault's Discourse

Like Gramsci, Foucault recognizes that interests and predispositions of networks of actors influence the accounts they construct of the world. Also like Gramsci, Foucault rejects the economic view that sees ideology as a simple product of material interests. Instead, Foucault would be particularly interested in Wynne's studies in the field of environmental policy formation, for example, which demonstrate how a wide variety of tacit social commitments (not just material interests but also disciplinary biases) can and do influence purportedly objective knowledge claims (Wynne 1994). Foucault identifies two main ways that ideas or, rather, "discourses" are embedded in social relations. First, he takes the poststructuralist linguistic turn by emphasizing that discourses are shaped through the shared medium of language. By adopting particular terms, metaphors, and modes of reasoning, networks of actors draw on the cultural narratives that give these linguistic forms meaning. Second, he emphasizes that embeddedness means that influence goes both ways. Discourses are tied to, and reinforced by, particular social and institutional practices that make them visceral in daily life (Foucault 1978, 97).

In addition to his insights on the social relations of discourse formation, Foucault also offers important observations on the effects of discourses. These effects are associated with the way that the shaping of discourse is a truth-claiming activity: discourses purport to describe reality in an authoritative and objective way. Because of their status as truth claims, discourses have a kind of agency, or normalizing power, in politics. This agency has two faces, one disciplinary, the other productive.

As disciplines, discourses restrict the boundaries of what makes sense, marginalizing actors who do not have the tools to participate in the debate on the terms that the discourse defines as acceptable and restricting avenues of credible resistance to the status quo. This disciplinary effect of scientific discourse has long been observed by analysts of environmental controversies (e.g., Wynne 1989; Shrader-Frechette 1991). In debates over genetic engineering, for example, those without technical expertise have limited power in both policy fora and the wider public sphere, even though they may have strong opinions on the matter and strong interests in the outcomes of deliberation.

Discursive truth claims are also productive, in that they define what *does* make sense, thereby *producing* new possibilities. In our example of scientific debates over GEOs, discourses empower certain actors, such as those with technical expertise, or those who are able to mobilize such expertise and arguments, even if these actors have little material or institutional power. (Although not all analysts frame such actions as discursive resistance, the ability to mobilize scientific knowledge claims has been widely recognized as central to the power of citizen's organizations in a broad range of environmental risk controversies. See Beck 1992; Richardson, Sherman, and Gismondi 1993; Irwin 1995; and Jasanoff 1997.) This characteristic of discourse means that actors routinely define themselves, their interests, and their perceptions of an issue in relation to dominant discursive frames. It also means that, rather than being silenced, certain forms of resistance are actually enabled within a discursive field. Examples in Chapters 2 and 3 demonstrate how the adoption of the scientific language of a permissive GE policy discourse organized around the notion of risk assessment, followed by a reinterpretation of this notion in a broader reading of GE risks, has enabled groups critical of the introduction of GEOs in farming to change the policy outcomes in at least two specific cases: the introduction of crops with pesticidal properties ("Bt" potatoes, engineered to produce a protein toxic to potato beetles), and the introduction of recombinant bovine growth hormone (rBGH) in Canada. Given these productive dynamics of discursive politics, Foucault stresses the inherent unpredictability of outcomes.

Foucault's keen insights into the nature of discursive power, and the action of this kind of dispersed "power/knowledge" in society, are best revealed

through his observations on two particular (and interrelated) sets of discourses and practices that are enormously relevant to the study of the emerging international genetic engineering regime: governmentality and biopower/biopolitics. (Foucault [1978] appears to use the terms “biopolitics” and “biopower” interchangeably.) Foucault uses the term “governmentality” to refer to the particular historical configuration of modern government that evolved in the eighteenth century. It was the product of two often conflicting tendencies. The first was a growing emphasis on the role of the state in governing human social life rather than simply governing territory (Rutherford 1999, 48). This *raison d'état* assumed that the state should develop a total knowledge of its resources and populations in order to maximize their productivity, thus bringing prosperity to the nation as a whole. At the same time, liberalism was emerging as a critique of state reason. Liberalism is typically understood as stressing the limits of governmental rationality and the rights of the individual to freedom from state control (49). While the ideology of liberalism does promote these values, Foucault argues that the discourse of liberalism did not actually undermine state reason. Rather, liberalism shifted its goals, centres of authority, and modes of application in a process that Foucault refers to as the “governmentalization of the state” (Foucault 1991).

In terms of ends, governmentality is intent on directing human conduct towards maximizing the public good. Because of this seemingly objective goal – framed as an object of truth that begs expert analysis and advice – governmentality involves a new relationship between knowledge and government. Institutions and expert bodies that are actively engaged in the study of society, political economy, public health, and ecology, among other areas – whether inside or outside the formal state apparatus – have taken on an important role in shaping the discourses of public life and population management within governmentality. Modes of administration are also diffuse and multi-layered. While the state maintains an active role, regulation is no longer its exclusive domain. There is also a critical role for what Rose and Miller (1992), drawing on Foucault, describe as “government at a distance”: the apparatuses, procedures, and tactics of government that are carried out by institutions that are formally at arm’s-length from the state, and the internalization of governmental norms by individuals in their daily activities. Because of its openness and complexity, governmentality is a highly unstable politico-epistemic configuration prone to change from within (Gordon 1991, 16).

I interpret Foucault’s concept of biopower as the manifestation of governmentality in the discursive field of human life. This term refers to the forms of power/knowledge concerned with fostering and administering human beings that first emerged in the eighteenth and nineteenth centuries. In

terms of social relations, biopower is bound up with the aspirations of industrial capital: "The investment of the body, its valorization, and the distributive management of its forces were at the time indispensable" (Foucault 1978, 141).

Foucault (1978, 140) refers to biopower as the "entry of life into history," the arrival of *life* as a distinct object of concern, with a wide range of accompanying knowledges and practices. Biopower involves administration of human beings by state and by non-state bodies, expertise, and "practices of the self," all intended to further the production and supervision of life across "two poles of development linked together by a whole intermediary cluster of relations" (140). At the one pole, the disciplines of medicine and nutrition, among others, focused on shaping the body of the individual – the production of a particular kind of human subject – to increase its utility and docility (139). At the opposite pole, the emergence of studies of population, agricultural productivity, living conditions, and biology focused on the supervision of the human being as object. Sex and reproduction sit at the pivot of the biopolitics axis. The biopower of sex is directed at organizing and regulating sexuality into a "concerted economic and political behaviour" (26).

Foucault's ideas, especially those about the power of discourse, have been employed by numerous researchers in studies of environmental policy (e.g., Litfin 1994; Wright 1994). However, this move often comes only after these scholars make an effort to clarify their position on what is perceived to be an absence of agency in Foucault's writings, the notion that, for Foucault, "power is everywhere and so ultimately nowhere" (Harstock 1990, 169-70). Litfin (1995, 253), for her part, argues that Foucault's analysis of power is actually incoherent without a conception of social agency, and so takes as a point of departure the interrelationship between discourse and agents. She argues that without agents promoting them, identifying with them, and struggling over them, discourses would not exist.

Litfin's is an important clarification, but it seems to take away from Foucault's observations on the strength of discursive power and the unpredictability of discursive politics. Wright's way of addressing this issue fits more closely with how I work with Foucault's insights here. She argues that policy analysts can take seriously Foucault's observations about the dispersal of power through discursive practices while still maintaining a voluntarist concept of agency. As Wright (1994, 14) puts it,

There is no reason not to assume that power may be expressed at the center as well as at the periphery, by agents as well as through institutions and discursive practices. The historical problem of revealing the processes through which power is diffused – from the center to the periphery and possibly vice versa – should not be foreclosed.

An Integrated Theoretical Approach

Both Gramsci and Foucault offer a great deal to an examination of the politics of genetic engineering and the Cartagena Protocol. However, there are significant differences between these two theorists that cannot be glossed over. For example, while both consider the central role of ideas in power relations, for Gramsci, the material dimensions of power relations remain the starting point for analysis. For Foucault, power has no “possessor,” and his works were written, in part, as a reaction to historical materialism and its fairly rigid notions of class-based power relations. Still, there are many ways that these theorists complement one another. There are even overlaps between their approaches and that of regime theory, such as on conceptualizations of governance.

Each of these three approaches would recognize that MEAs are about more than nation-states collectively determining how to govern the international environment. For its part, regime theory begins with the understanding that while regimes usually have institutional dimensions, they also have normative and cognitive dimensions, and that these are as likely to have been shaped by the participation of non-state actors as they are to have involved nation-states. Gramsci also emphasizes this kind of governance through his theory of the “extended state,” which includes both political and civil society, with the latter fundamentally important to the authority and stability of the former. A similar theory of governance, broadly conceived, is developed in Foucault’s concept of governmentality. Foucault stresses the role of non-governmental bodies, expertise, and disciplinary *savoirs* (originating both inside and outside the state) in establishing the norms of modern governmentality.

These shared observations on governance point to the need to examine the emergence of an MEA such as the Cartagena Protocol on Biosafety historically and contextually. This treaty needs to be studied as one element of a wider regime – the body of discourses, practices, and institutions that have come to constitute the field of genetic engineering governance across civil and political society – that is in the process of being constructed. How has this context shaped the Cartagena Protocol, and what are the protocol’s effects within this regime as a whole?

When neo-institutionalists study an emergent regime, they tend to focus on the mechanics of cooperation, and the development of shared understandings. While there certainly are elements of cooperation and consensus-formation in the field of biosafety that need to be documented, this field has also been a terrain of conflict and struggle among actors who hold widely divergent perspectives on the nature of the genetic engineering “problem” and how it might be solved. To gain a grasp of this field of both conflict and consensus, the Gramscian theorization of politics as a war of position engaged in by groups trying to normalize their own perspectives as hegemonic,

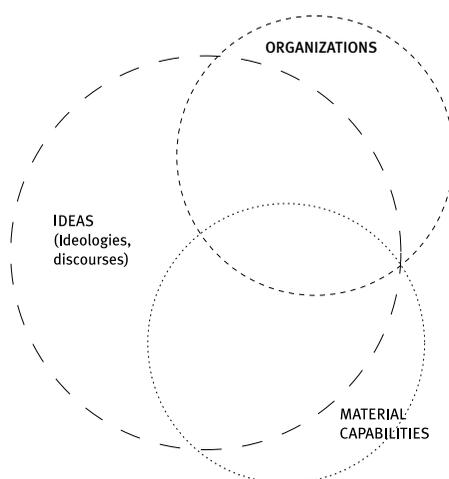
and needing to make accommodations in the process, offers a strong overarching conceptual frame.

This approach means trying to understand the politics of genetic engineering in terms of the three sets of relations of force, or arenas of political activity. Following Cox and Levy and Newell's interpretations of Gramsci, I refer to these three realms as material capabilities, organizations, and ideas. Each is a site of action, of alliances, and of struggle, through which actors with an interest in GE issues (including individuals, states, businesses, and environmental organizations) engage to build structures supportive of their interests. While conceptualized independently, these three sets of relations of force are closely interrelated, with the balance of one set of forces being, at any given time, potentially both a product of and productive in activities and struggles in the other two fields. Figure 1 depicts the three sets of relations of force as intersecting circles, with the realm of ideas (understood to function ideologically and/or discursively) larger than the other two circles. This size differential conveys the notion that for both Gramsci and Foucault, ideas represent the most important arena of modern political activity. Furthermore, for both of these theorists, it would be impossible to speak of material capabilities or organizations with any real political impact (power) that are not intrinsically linked to, made sense of within, and defended through ideational structures.

What does it mean to examine each of these three sets of relations of force, and how do the theoretical approaches I draw upon inform such an

Figure 1

Relations of force



examination? Material capabilities, for Gramscians, remain the foundation of national and global politics. To take material forces seriously as an arena of political engagement means to pay attention to the dynamics of finance, production, consumption, and the material dimensions of technological change. In this case, looking at material capabilities requires an analysis of the major productive actors in the field of agbiotech, from the academic researchers that developed the techniques of genetic engineering to the seed companies, farmers, food processors, distributors, and consumers who buy and sell GEOs. It also means examining the actions of those actors who actively reject GEOs and define themselves accordingly. The ways that these groups conduct themselves, in terms of the products they grow and market and how they interact with one another, create the material conditions around which struggles over the ideas and the organization of genetic engineering governance take place.

The second set of relations of force, of organization and institution building, is a central preoccupation of both regime theorists and Gramscian analysts. Regime theorists point to the need to study the way that states, under the influence of domestic pressures and international obligations, are able to negotiate shared norms on the question of biosafety. Their approach urges a focus on the development of scientific consensus, the formation of shared interests, and the role of international institutions in facilitating cooperation.

While the dynamics of interstate cooperation are important to study, Gramscians would argue for the need to look at these relationships in the context of social relations in the extended states that make up the international community. It is at the levels of civil society that alliances are first formed, where organic intellectuals initially exercise leadership, where concessions towards potentially divergent interests are made, and where consensus is generated. These alliances then help shape political society (the state) and eventually international treaties. By the time a country such as Canada enters international negotiations on an issue such as biosafety, its stance is not simply a national position; it is rooted in the social relations of biotechnology within Canada's state-civil society complex and has also already been influenced by transnational state and civil society networks.

When it comes to organizational relations of force, there is one role that Gramscians do recognize as being reserved for the nation-state, narrowly defined: coercion. Consensus may be developed in formal institutional negotiating fora, but states also use military or, as is more likely in the environmental field, trade pressures to bring other states into conformity with their positions on the best definition of an international regime. The role of coercion is often ignored by neo-institutionalists focused on the *negotiation* of consent, but it must be a part of the analysis of biosafety politics undertaken here.

Ideas are the third set of relations of force and arguably the most important. As with the other forms of political activity in this integrated framework, ideas need to be studied as sites of struggle that crystallize within the context of social and material relations, rather than being brought to politics from somewhere on the outside. This model theorizes ideational struggles in two ways in order to draw attention to two distinct aspects of the power of ideas. Following Gramsci, it is useful to think of some ideas as ideologies. While designed to represent a common interest, an ideology can be traced back to the interests (whether material or otherwise) of specific classes or groups in society, and to the ideological apparatus and organic intellectuals who gave it shape. At the same time, because they act as resources in the process of alliance formation and accommodation of otherwise disparate social groups, ideologies can genuinely come to reflect a plurality of interests.

This framework also adopts Foucault's insights on the discursive function of ideas. The distinctions and overlaps between the Gramscian concept of ideology and the Foucauldian notion of discourse are outlined in Table 1, which presents simplified definitions, along with key concepts related to the formation and effects of these two types of ideational forces.

It is clear that there is considerable overlap between the theoretical concepts of discourse and ideology, yet there are also important distinctions. Among the most important concepts that a Foucauldian analysis adds to a researcher's analytical toolbox is greater attention to the way discourses are embedded in language and conventions of truth (whether scientific or otherwise). Gramscians may recognize that ideas can have productive effects by legitimating certain courses of action, for example, but a discursive study of the normalizing effects of ideas as truth would look for more far-reaching impacts. It is also important to consider that among the impacts of a discourse is the way that interests, and the very self-perception of agents, are constructed and reinterpreted in a discursive context. This suggests a more complex relationship between knowledge, interests, and agency than the Gramscian reading of ideology. Furthermore, not only do powerful ideas require negotiation and consensus building, they offer loci of resistance. This relationship between power and resistance within discourse is important to explore and, once again, it is a direction that a Gramscian reading of ideology does not suggest on its own. Finally, because of the way debates over truth empower those groups able to mobilize technical expertise, and because of the internal logics of these truths, ideas are not as easily manipulated by specific groups in society as the Gramscian reading of ideology suggests, or as those who engage with them might hope.

Viewing the politics of ideas as discourses in the realm of agricultural biotechnology and the environment through a Foucauldian lens clearly adds directions of inquiry to a study of the power of ideologies in this field.

Table 1

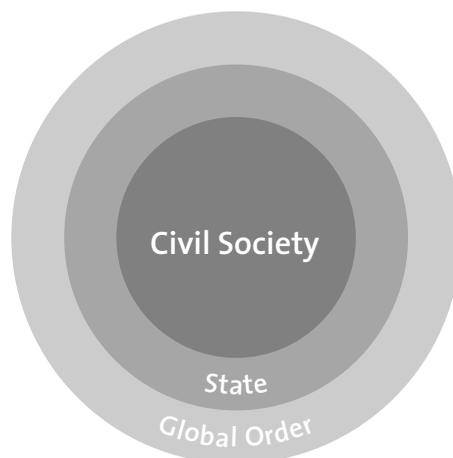
A comparison of Gramscian ideology and Foucauldian discourse

	Ideology	Discourse
Simplified definition	A coherent, systematic philosophy designed to be the new "common sense"	An ingrained pattern of talking, thinking, and doing held as truth
Formation	<ul style="list-style-type: none"> • Driven by specific agents • A manifestation of interests (material or otherwise) but not necessarily a product of material structures • The outcome of struggle and compromise • Eventually reflects a plurality of interests 	<ul style="list-style-type: none"> • Discourse/agency relationship not linear • Often defined by experts • Rooted in language, history, and culture • A product of contestation • Mutually constitutive with social and institutional practices
Effects	<ul style="list-style-type: none"> • Guides behaviour • Legitimizes certain activities • Unifies law, economic activity, and art • Enables consent and the formation of alliances 	<ul style="list-style-type: none"> • Produces specific outcomes by defining what makes sense • Disciplines actors and outcomes by marginalizing other ways of knowing and doing • Creates opportunities for resistance

Methodologically, this combined approach requires an analysis of the positions taken in the formation of the biosafety regime – in the Cartagena Protocol negotiations and outside it – and the social and material relations to which they are tied, the layers of meaning on which they depend to make sense, and the full range of their productive and disciplinary effects.

The term "historical bloc," as I use it here, refers to the functional units of allied social forces that form around a set of ideas in a specific field. An historical bloc is the product of hegemony construction on the part of a class or other social actor, rooted first and foremost in civil society, and necessarily allied with arms of the state. Once formed at the level of extended states, an historical bloc can be expected to continue working to build and maintain hegemony through both coercion and consent, with the latter involving the formation of a new "common sense." The centrality of civil society in an historical bloc, including norms, values, and expertise established at this level, as well as civil society's ideal relation to the state and the global order, are depicted in Figure 2. While the three levels are shaded, there are no firm boundaries between them. This is meant to indicate the

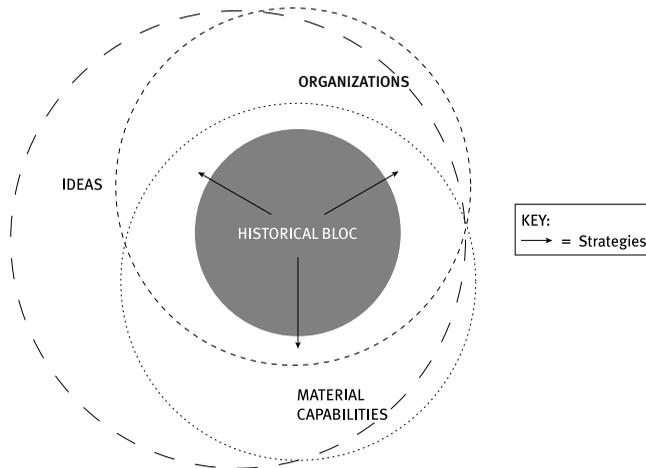
Figure 2

Historical bloc

close relationships that need to exist between the three levels for an historical bloc to be successfully established, or hegemonic. To achieve its hegemonic status, a great deal of consensus building and accommodation must also have taken place. As a result, the historical bloc that achieves global hegemony is never the same bloc, with exactly the same agenda, as that which began the process at the heart of civil society.

Another way of conceptualizing an historical bloc and its hegemonic ambitions, one that demonstrates more clearly the importance of the three sets of relations of force described above in its creation and maintenance, is presented in Figure 3. This diagram builds on Figure 1. The area at the intersection of the three concentric circles of relations of force in these two figures can be thought of as the material-ideational-institutional convergence that is necessary for an historical bloc to gain a foothold. In consolidating hegemony, whether at national or international levels, an historical bloc works to solidify and extend its alliances through strategic actions, eventually (if successful) expanding the area of overlap among the three circles, as Figure 3 illustrates. By definition, however, a hegemonic constellation, even if temporarily stable, is never fully consolidated and always remains contested from outside as well as from within. This is illustrated by the spaces that remain outside the hegemonic formation but within the political constellation as a whole.

Figure 3

Hegemonic relations of force

The Gramscian view of temporary, contested hegemony is not unlike what Foucault describes as a discursive constellation of power/knowledge. Both perspectives invoke pervasive structures that involve ways of thinking, talking, and doing that together define the world, objectively and subjectively, at a particular point in time. Foucault's description of governmentality and of biopower, I would suggest, can each be seen as descriptions of constellations that became hegemonic within their respective fields. Both Gramsci and Foucault point towards the need to conceptualize the field of biosafety, with its own internal political dynamics, as emergent within the context of already extant hegemonic/discursive constellations.

Gramscian scholarship would suggest that the genetic engineering industry emerged within an already hegemonic constellation centred on transnational capital and the ideology of neo-liberalism. This wider constellation can be expected to have influenced genetic engineering through material relations as well as through its particular conceptions of property rights, norms of acceptable (and unacceptable) government intervention, and assumptions about the inherent value of growth and liberalized trade. The institutions of neo-liberalism, such as the WTO and the OECD, need to be studied to see what roles they may have played in the development of agbiotech. Being hegemonic, the neo-liberal order is also necessarily contested and productive of its own resistance. One source of resistance is the

environmental movement. This resistance raises the question, how have the political dynamics of environmentalism, shaped in the context of neo-liberalism, affected politics in the field of biotech?

A Foucauldian analysis points towards the structures of biopower as a locus of dispersed power active in the genetic engineering field. This constellation is centred on discourses and practices of the governance of life. It brings together industrial capital, military interests, science, and practices of governmental administration and regulation. Biopower appears to have shaped the field of biotech on multiple fronts, from the engineering drive of molecular biology to the practices of environmental regulation that are employed in this field. Foucauldian scholarship also stresses the points of resistance within biopower related to practices of environmental management and to the quest of individuals to regain control over their own food and health, for example. How have each of these factors shaped the biopolitics of agbiotech?

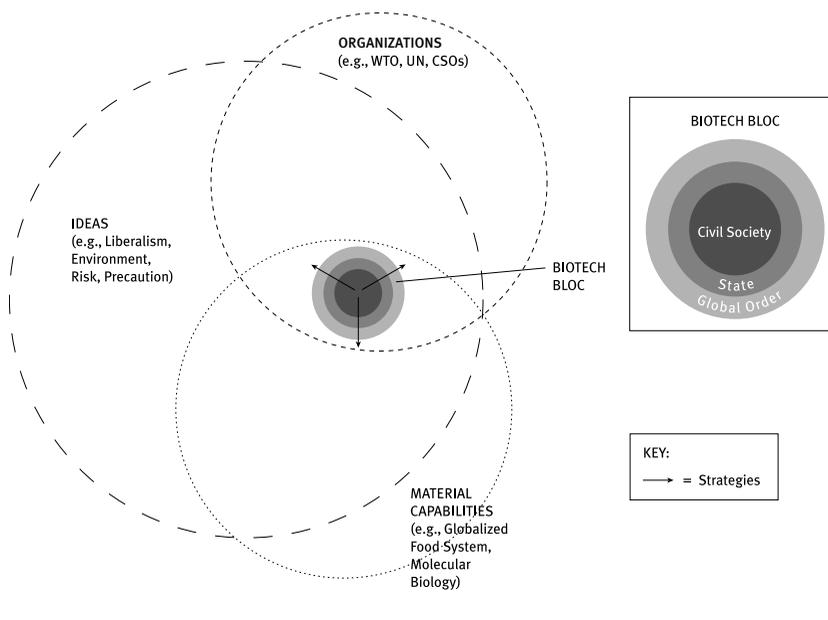
Insights gained from the study of these two hegemonic/discursive constellations are enormously useful in contextualizing the politics of biosafety and the Cartagena Protocol, and they are unpacked in Chapters 2 and 3. While I don't wish to obscure differences by suggesting that conceptualizations of biopower and the transnational historical bloc are inherently complementary in all respects, they do both point to related sets of ideas and practices that have likely been influential in shaping the politics of GE. Specifically, they point to the importance of liberalism (as an ideology and/or as a discourse), contemporary state-scientific-industrial relations in the West, and the politics of environmental resistance as key elements of the hegemonic/discursive order within which the biotech industry, and the politics of biosafety, emerged.

The integrated theoretical framework presented here is ambitious. It sets out to interpret the Cartagena Protocol on Biosafety as an MEA shaped within an emerging global regime of genetic engineering governance. This framework suggests looking at biotech governance and, indeed, at the agbiotech project itself, in the context of activities and debates that have taken place across three sets of relations of force. That these relations of force are not narrowly bounded by the field of biotechnology itself points to the need to examine these struggles in the context of the larger hegemonic/discursive constellations of the transnational historical bloc and biopower.

Figure 4 presents an overall conceptual map for this study. The object at the centre of our inquiry is the project of agbiotech and the actors, ideas, and institutions that came together to initially support this revolution in agriculture. The state and civil society complex (or nascent historical bloc) identified in this figure is what I describe in Chapter 2 as the biotech bloc. It is dependent on overlapping institutional, material, and ideational support structures for its existence, so it is located in the centre of the diagram where

Figure 4

Integrated conceptual map



such overlaps occur. At the same time, surrounding the biotech bloc is a wider array of institutions, material capabilities, and ideas, some of which support the bloc's ambitions and some of which do not. The relationships between wider relations of force and the biotech bloc (at the level of civil society, the state, and global order), and the strategies the biotech bloc developed to build support in each of these arenas of political activity, are worked out in the next two chapters. The larger question that really drives our interest here, that of the relationship between the three sets of relations of force, the biotech bloc, and the Cartagena Protocol itself, are developed in Chapters 4 through 7. One way of phrasing the query that this conceptual framework can help us answer is: What is the relationship between the regime that has enabled agbiotech to come into being, and the institution, norms, and discourses of the Cartagena Protocol on Biosafety?

Because of its hybrid nature, my theoretical framework raises important questions. First, is the distinction between the function of discourses and ideologies truly helpful in theorizing ideational politics, or am I simply splitting hairs in drawing out these distinctions? This is important given that some Gramscian scholars, such as Levy and Newell (2002), speak of ideologies and discourses as if these concepts are synonymous. Second, can this

framework really help make sense of a political event, such as the emergence of the Cartagena Protocol, in a way that any of the three theoretical traditions I draw from could not on its own?

Several questions are also raised by my integration of Foucault and Gramsci's ideas, since the differences between these theorists may be as important as what they share in common. For example, consider the issue of hegemony and change. Foucault's analysis of discursive politics emphasizes the inherent unpredictability of outcomes and thus the fluidity of politics. Gramsci acknowledges that change to hegemonic formations often arises from within a hegemonic formation, but his definitions of historical blocs and hegemony appear to suggest rigid structures with static leadership and overarching material goals. If we want to take the possibility of incremental (and unpredictable) change seriously, how would this affect the way we understand historical blocs and hegemony?

Another question concerns the conceptualization of resistance politics. Many Gramscians theorize political struggles in terms of hegemonic and "counter-hegemonic" forces (e.g., Hisano 2005). Foucault, on the other hand, characterizes normalization and resistance as inextricably linked. If Foucault's observations have merit, how might this affect an understanding of counter-hegemony?

A final question concerns the role of agency. Gramsci identifies organic intellectuals as political actors with a high degree of agency, understood as the power to consciously reformulate political life. Foucault, however, refuses to discuss agency in much of his work, focusing instead on webs of discursive power. These webs, in his view, are the truly pervasive forms of power in society, "yet, it is often the case that no one is there to have invented them, and few who can be said to have formulated them" (Foucault 1978, 95). How are we to reconcile these two understandings of power in a way that builds, rather than takes away from, the insights of both of these influential thinkers?

These questions cannot be answered at a solely theoretical level. So, I bring them along into the empirical chapters of this book, addressing them when the material offers relevant insights. I conclude Chapter 7 by showing how the case study presented in these pages actually allows us to bridge some of the theoretical differences between Gramsci and Foucault.