The International System and Its Environment
Modern Evolutionary, Physiological and Developmental Perspectives on Change in World Politics

Dissertation
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By
Sebastien Mainville, B.A., M.A.
Graduate Program in Political Science

The Ohio State University
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Dissertation Committee
Alexander Wendt, Chair
Alexander Thompson
Bear Braumoeller
Abstract

In this dissertation I critique the Darwinian perspective on the international system, an important set of assumptions that underlies the foundational claim that the international system is a competitive anarchy. The Darwinian perspective assumes that the international system is a population of states that simultaneously constitutes the primary security environment for individual states, and that the evolution of this population is governed by the logic of Darwinian competition. I challenge this perspective, which is widely shared across the paradigmatic divides of the International Relations (IR) discipline, by offering a complete redescription of the evolutionary origins, organization, structure, and development of the international system. To do so, I draw from three modern biological theory perspectives that have yet to get the attention of IR scholars: Major Evolutionary Transitions to Individuality (METI), Self-Producing Systems, and Developmental Systems Theory (DST). From these perspectives, I argue, the international system appears in the process of becoming an individual superorganism. This claim challenges a number of popular beliefs in IR, such as the belief that Darwinism legitimates Realism’s pessimistic take on the international system, that the international structure is at its most fundamental level an anarchy, and that the evolutionary origins of the international system give us straightforward answers to its present and future transformations. In addition to challenging these core assumptions of IR theory and others, the dissertation also subsumes some of the most important and puzzling contemporary phenomena in international politics under a single transformative logic: the decline of inter-state war; the growth of international cooperation, integration, and organization; the displacement of collective security threats from states to non-state actors and phenomena; the growing net benefits from statehood; the persistence, expansion, and entrenchment of the international system in the face of globalization challenges; and the relationship of mutual construction between the international system and globalization.
Dedication

For Luc

1953-2011
Acknowledgments

In the long process of completing this dissertation, I have incurred many debts, intellectual and personal, which I would like to acknowledge.

First, my intellectual gratitude goes to the members of my committee. I always derived some pride in referring to them as my tripod, for the balance their intersecting perspectives provided. Their open-mindedness is true to the spirit of the IR group at OSU. Bear Braumoeller has forced me more than anyone to substantiate my claims and to justify my logic more rigorously. I greatly benefited from Alex Thompson’s dissecting mind and from his remarkable ability to grasp exactly where I was trying to go and to help me get there more efficiently. And most importantly, there is no way I can fully express my gratitude to Alex Wendt, who has been an outstanding adviser and role model, patient and encouraging, but also always challenging in that Socratic way. He has been a constant reminder of the truth of Michael Polanyi’s claim that Great Mind and Great Beings are intimately related. Under his supervision, I have learned much ‘more than I can tell.’ All of the shortcomings of this dissertation are only mine to bear.

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Like Molière’s Bourgeois Gentleman, Sun Tzu may have been writing about academic research ‘without knowing it’ when he wrote that in war, “the line between disorder and order lies in logistics.”¹ For helping me manage all sorts of logistical sources of ‘friction,’ especially as my supply lines stretched the 700-plus miles separating Columbus from Montreal, I owe a heavy debt to Rick Herrmann, our Department Chair, Bear Braumoeller, our Director of Graduate Studies, and particularly Courtney Sanders, our Graduate Program Coordinator. In the same vein, I would particularly especially like to thank the people and organizations who have made it possible to write the dissertation from my outpost in Montreal: Vincent Pouliot (again!), the Department of Political Science at McGill University, and the Centre for International Peace and Security Studies (CIPSS) offered me an office and a stimulating intellectual environment where I wrote most of the pages that follow. Finally, because like a soldier, a graduate student ‘marches on his stomach,’ I would like to acknowledge the Fonds de Recherche du Québec – Société et Culture (FQRSC), and the Department of Political Science and the Graduate School at the Ohio State University for their financial support at different stages of the project.

I owe my greatest debt, however, to my loved ones. Without their affection and support the whole enterprise would have been meaningless. Tout d’abord ma maman, Lisette, qui ne m’a jamais laissé oublier qui je suis et d’où je viens, et qui m’a constamment rappelé l’importance de chercher un équilibre dans ma vie. Sans toi je ne serais pas la personne que je suis. Puis mon frère, Guillaume, sur qui je peux toujours compter, et le seul avec qui je peux partager cette façon d’être particulière qui est la nôtre depuis aussi longtemps que je me souvienne.

¹ Sun Tzu 1993: 78.
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Last but not least, I want to dedicate this dissertation to my father Luc. He has had an influence on every parcel of the person that I have become. He made me believe that I had strengths in me that I never suspected and that the only dreams worth dreaming are those that seem impossible. He was a father figure in every sense of the term, and I owe him both the will to tackle an ambitious and unconventional dissertation project and the discipline to see it through and do it my way. While he left us too early to take an active part in this dissertation, the journey began much earlier than that, on his shoulders.

Montreal, June 2016.

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2 With a nod to Dr. Seuss.
Vita

2007 .......................... B.A. Political Science (With Distinction), Concordia University

2009 .......................... M.A. Political Science (Dean’s Honours List), McGill University

2009 ........................................ University Fellowship, The Ohio State University

2010-12 ............................ Graduate Assistantship, The Ohio State University

2012 ........................................ M.A. Political Science, The Ohio State University

2012-13 ............................. Graduate Instructor, The Ohio State University

2013-16 ................................................. FQRSC Doctoral Fellow

2013-16 ........................................ Pre-Doctoral Fellow, CIPSS, McGill University

Field of Study

Major Field: Political Science
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Introduction

“Let us then assume that crises are a necessary precondition for the emergence of novel theories and ask next how scientists respond to their existence. Part of the answer, as obvious as it is important, can be discovered by noting first what scientists never do when confronted by even severe and prolonged anomalies. Though they may begin to lose faith and then to consider alternatives, they do not renounce the paradigm that has led them into crisis. They do not, that is, treat anomalies as counterinstances, though in the vocabulary of philosophy of science that is what they are.... Once it has achieved the status of paradigm, a scientific theory is declared invalid only if an alternate candidate is available to take its place.... The act of judgment that leads scientists to reject a previously accepted theory is always based upon more than a comparison of that theory with the world. The decision to reject one paradigm is always simultaneously the decision to accept another, and the judgment leading to that decision involves the comparison of both paradigms with nature and with each other.”

- Thomas S. Kuhn

This dissertation is an inquiry into the character and transformation of the international system, which arguably constitutes the most important object in the ontology of international politics.\footnote{Kuhn 1962: 77.}{\footnote{“A theory’s ontology consists of the real-world structures (things, entities) and processes posited by the theory and invoked in the theory’s explanations.” Dessler 1989: 445.}} What is the international system? How does it...
change? While these questions have a highly theoretical character, they nonetheless have political and practical urgency. These fundamental theoretical questions need to be addressed in order to gain a better understanding of contemporary and future international political dynamics in the globalization era, at a time when the state systemic form of global political organization is in the midst of a complex and puzzling mix of changes and continuities. Indeed, globalization’s effects will depend on the kind of system the international system is. To understand the contemporary and future impact of globalization, thus, we should begin by inquiring into the theories we use to think about the international system.

As it turns out, there is not much variation in the way we think about the international system in IR. Almost all IR theories, across paradigmatic divides, assume that the international system is, at its core, a competitive anarchy. Almost no one disagrees with this assumption, not even, I will argue, scholars pushing for the study of hierarchy. Underlying international anarchy is another set of assumptions that pictures the international system as a Darwinian population that simultaneously constitutes states’ primary security environment. Unsurprisingly, IR scholars have, whether implicitly or explicitly, applied a Darwinian framework when studying the transformation of the international system, assuming that the international system evolves primarily through a selection process driven by inter-state competition. This Darwinian frame has served to legitimate Realism’s pessimistic and tragic take on international relations. It has also led us to downplay and sometimes ignore important trends
towards more cooperative and peaceful international relations that, I will argue, are not ephemeral glimpses of false hope, but have the potential to constitute major structural transformations of the international system, with far reaching consequences for world politics.

In this dissertation, I critique this hegemonic way of thinking about the international system by targeting the Darwinian assumptions that legitimate it. I highlight three major problems with a Darwinian perspective on international system transformation. First, traditional evolutionary perspectives on international system transformation cannot provide us with insights about the future of the international system under globalization. This is because evolutionary theory’s explanatory structure – which gives the primary causal role to the environment and exogenizes this environment vis-à-vis the evolving system – makes it backward-looking and notoriously “blind to the future.” Second, exogenizing the environment from the system robs an evolutionary perspective of the ability to grasp how the international system’s own activities actually produce many of the most important globalization phenomena that appear to challenge it. And finally, a Darwinian perspective on the international system contains an implicit bias towards conflict, and thus, legitimates Realism’s pessimistic outlook on the international system, leading us to overlook the far reaching structural implications of key trends towards a pacified, cooperative, integrated and organized international system.
While I share the goals of existing critiques of the anarchy problematic, such as Richard Ashley, John Ruggie, and Alexander Wendt, unlike them I do not borrow mainly from social theory. Instead, I combat fire with fire, so to speak, and challenge Darwinian assumptions with critical resources from contemporary biological theory. The result of my inquiry is a complete redescription of the international system, from the perspective of modern evolutionary, physiological and developmental biological theories, that not only enables us to think about some of the most important recent transformations in the international system, which the Darwinian perspective obscures, but that also provides us with intellectual tools to think about the transformative potential of the contemporary international system and thus, its probable future.

My central claim is that the international system appears to be in the midst of what modern evolutionary biologists call a Major Evolutionary Transition to Individuality, or METI. METIs are critical junctures in evolutionary history during which individuals which were previously independent and competing succeed in reducing conflict and fostering cooperation to such a high degree that they de-Darwinize their relations and become a new collective individual or agent. The international system, which IR scholars typically think about as the population of individual states, is becoming an individual in its own right. In other words, the structure is becoming an agent. The decline of inter-state war, the growth of cooperation, integration and organization, and the growing net benefits associated to recognized statehood, suggest that the environment constituted by inter-state relations has de-Darwinized. Selection pressures have
been displaced from individual states to the international system as a whole, which, as a cooperative, integrated, and organized unity, now faces its own set of challenges from its environment: nuclear proliferation, global terrorism, global warming, to name a few. The international system METI has important and far reaching consequences for the way we think about the international system and its transformation.

**Structure of the argument**

What is the international system? How does it change? I answer the first question by challenging the dominant Darwinian view of the international system, which pictures the international system as an environment posing competitive constraints and opportunities for individual states. In contrast to the more traditional Darwinian worldview that underpins this picture, in which states-as-organisms are depicted as competing under conditions of Darwinian selection, I propose that the international system is in the process of becoming an individual. More specifically, I argue that the international system is an emerging superorganism, a collection of organisms that possesses the functional organization of a single organism and that is itself, as a whole, the object of selection pressures. Like an organism, I argue, the international system is a self-producing (or autopoietic) system, that is, a closed network in which components (sovereign states) and processes (international practices) are primarily oriented towards the reproduction of the closed network that produces them. Being self-
produced, thus, the international system exhibits a remarkable degree of autonomy from its environment, which has the effect of making it particularly resistant to fundamental transformations.

My answer to the second question flows from my answer to the first. If the international system is becoming an individual superorganism, then ‘development,’ and not ‘evolution,’ will characterize its future transformations. While a modern evolutionary perspective, METI theory, tells us how the international system has been put on the tracks to individuality, a developmental perspective will be needed to tell us where those tracks will take the system in the future.

The dissertation challenges three influential and widespread beliefs about the character and evolution of the international system: that a Darwinian evolutionary perspective on the international system supports Realism’s pessimistic outlook on international politics; that the international system has a fundamentally anarchic structure; and, that insights into the evolutionary origins of the contemporary international system will give us straightforward answers about its future. Contra these beliefs, I argue that Darwinian mechanisms can explain the pacification and growing cooperation, integration, and organization of international politics, phenomena that are traditionally associated with Liberalism and Constructivism; that international anarchy is actually made possible by a more fundamental hierarchic structure; and that once we take into account the most recent evolutionary transition in the international system, we
are forced to accept that development, not evolution will give us answer about its future.

I have divided the dissertation in three major parts. In Part A – Evolution – I challenge the belief that a Darwinian evolutionary perspective necessarily supports Realism’s pessimistic view about the international system. In fact, I argue that we can use the best and latest thinking in Darwinian evolutionary theory to build a parsimonious account of the contemporary decline of inter-state war, the simultaneous growth of inter-state cooperation, integration, and organization, and the growing net benefits from statehood, all phenomena that are typically associated to Liberalism and Constructivism and that Realism has struggled to account for. More specifically, I argue that the international system appears to be in the midst of an important structural transformation that modern evolutionary biologists call a Major Evolutionary Transition to Individuality (METI). The international system, which we traditionally understand as a Darwinian population and environment, is in the process of de-Darwinizing its ‘internal,’ inter-state relations, and natural selection processes are being displaced to the level of the whole system’s ‘external’ relation with its environment. METI theory not only offers a parsimonious account of these important international political trends, but it changes the way we have been thinking about the ontology of the international system in a fundamental way. Indeed, Liberal and Constructivists accounts have, with few exceptions, interpreted these trends via the traditional prism of the international system as a population of individual states and environment for individual states. If we
accept the METI hypothesis, however, this means that the international system is more than a population and environment: it is becoming an individual in its own right. The structure is becoming an agent.

However, since this folk biological and commonsensical assumptions about the nature of real individuality make it exceedingly difficult for us to think about the international system as an individual or agent, I preface this argument with a discussion of how contemporary biologists think about the question of individuality today. Biologists locate individuality at all levels of the hierarchy of the living, from prokaryotes to whole forests via termite colonies and the whole human “superorganism,” which is itself a community in which bacteria dramatically outnumber genetically human cells. From a biological standpoint, I conclude, there is no a priori reason why the international system could not be an individual.

In Part B – Organization and Structure – I address the follow up question “What kind of individual is the international system becoming?” I argue that the international system can be understood as a superorganism, a collection of states-as-organisms that together possesses the functional organization of a single organism and that is itself the object of selection pressures. Using a physiological approach, the theory of self-producing systems, I redescribe the international system as a self-producing (or autopoietic) system. I argue that the key organizing principle that constitutes the international system a self-producing system is the international institution of sovereignty, which constitutes
a closed network of self-production in which states, via exclusionary “international practices,” are actively engaged in the reproduction of the self-production network that produces them. International sovereignty (re)produces itself.

Using the logic of self-producing systems helps me describe further the emergence of key mechanisms – system cognition, immune reaction, and the control of reproduction – that contribute to the further de-Darwinization of the international system. It also enables me to show that international anarchy and sovereign equality are made possible by an ontologically more fundamental global hierarchy (stratificatory differentiation) between sovereign states and other non-recognized political entities in global politics.

The shift in perspective that this argument implies is not limited to the international system but actually bears important implications for how we think about individual states as well. The redescription of international anarchy, as resting on an ontologically more fundamental hierarchical structure, sheds a new light on our understanding of the individual state’s corporate interests.\textsuperscript{5} Indeed, it suggests that a state’s corporate interests are not only defined by its position in the international system, but also to a large extent by the position of the international system itself in its own environment. In other words, because modern states share a common interest in the reproduction of their position atop global politics, an element of “class solidarity” is embedded in their core interests.

\textsuperscript{5} Cf. Wendt 1999.
This should be seen as creating a greater potential for cooperation in the system, especially if and when the structure of the system itself is threatened, and as a plausible explanation for the overwhelming inter-state cooperation over global nuclear terrorism and piracy.

In Part C – Development - having defined the international system as an individual superorganism characterized by self-producing organization, I come back to the question of change, and ask the follow up question: if the international system is becoming an individual, how will it further change? In other words, if the international system has been put on the tracks of individuality, where will those tracks lead it? There, I challenge the widespread assumption that an evolutionary perspective on the origins of the international system offers direct answers to an understanding the future of the international system. Evolutionary explanations are about change in a population via differential turnover in the individuals that constitute this population. When it comes to studying change in individuals over the course of their lifecycle, however, biologists use an alternative approach, development. The two perspectives on change are different at all levels, from their unit of analysis to their expectations about change. If the international system is becoming an individual in its own right, it therefore follows that a developmental perspective that makes the changing individual its unit of analysis is likely to prove more useful. Having justified its necessity, I thus introduce the first ‘developmental’ model of change in IR. While development is well-theorized as a distinct

\[\text{Spruyt 1994.}\]
perspective on change in biology and psychology, for a number of reasons this has not been the case in IR, where we often refer to evolution and development as synonyms, sometimes in the same sentence. There, I will describe the important differences between the two perspectives and explain how they yield dramatically different expectations about the transformative potential of the international system in relation to globalization. I will argue that while an evolutionary perspective expects globalization to lead to fundamental transformations, a developmental perspective leads us to expect these transformations to follow a conservative process whereby changes in international practices serve to insulate the fundamental self-producing organization of sovereignty from direct challenge.

Outline of the introduction

My goal in this introduction is to lay the empirical and conceptual grounds for the evolutionary, physiological and developmental perspectives on the international system I will unfold in the dissertation. To that end, the rest of this introduction is divided into four sections. In the first section, I begin by justifying the importance of asking questions about the ontology of the international system in the globalization era. There, I describe a number apparently conflicting and so far only loosely connected contemporary international political trends that I tie together with the three biological perspectives I introduce in this dissertation. In the second section, I identify an important source of our confusion about the relation between the international system and globalization, the Darwinian
perspective, a set of assumptions about the ontology of the international system. This perspective, I argue, has contributed to obscuring important emerging structures and dynamics that characterize contemporary international politics. In the third section, I discuss the philosophical and methodological approach that I take in this dissertation. And in the final section, I outline and summarize the arguments and chapters of the dissertation.

The international system in question

The international system – the distinct realm created by the interaction of the 193 plus mutually exclusive, territorial ‘states’ that organize the globe politically – plays a central, foundational and legitimating role in and for the discipline of International Relations (IR). The idea that the interactions and relations occurring ‘between’ states differ fundamentally from the dynamics occurring ‘inside’ states means that ‘the system’ must figure in the analysis in some way, either as an independent, dependent or control variable, and that elucidating ‘international’ phenomena requires specialized knowledge over which the IR scientific discipline has special competence. A routine consideration in most works of IR is thus to consider the effects of ‘the system’ on important international phenomenon such as war, cooperation, alliance formation, arms races, norm diffusion, etc. As Bear Braumoeller puts it, “the main advantage to thinking systemically about the problems of IR is that the international system is

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7 This is Waltz’s thesis Waltz 1959. For a critical discussion see Walker 1993.
a system, and it acts like one.... The systemic nature of international politics creates analytical problems that are difficult to resolve at best and intractable at worst.” “In short,” he concludes, “no amount of sophistry, deft wielding of assumptions, or outright hand-waving can provide an adequate substitute for actually including the entire system, or at least its major actors, in the analysis.”

Indeed, as many graduate students in IR find out, if the international system does not figure somewhere in your research project, there will be a lingering suspicion that your work does not belong to IR but to comparative politics.

Beyond its explanatory importance, the international system also constitutes the disciplinary boundaries of IR: the international system carves out a distinct domain of inquiry, an ‘inter-national’ that differs in kind (though not always in degree) from other domains of social life. By establishing and justifying the IR discipline’s special competence over ‘international’ phenomena, the anarchic international system thus performs a foundational and legitimating role for IR as a scientific discipline. The international system is ‘our’ system and the fate of our discipline, in its current form, is intertwined with it.

*Transformations and continuities in contemporary world politics*

What is the contemporary status and future of the international system? Contemporary international politics offer a puzzling blend of transformations and continuities that, taken as a whole, has thus far eluded IR theory. On the one hand, in light of a number of dramatic contemporary changes that appear to

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8 Braumoeller 2010: 159.
undermine state sovereignty, such as globalization and the transnational processes and flows that constitute it, nuclear proliferation and the specters of nuclear terrorism, global warming, and global epidemics, among others developments, the future of the international system constitutes one of the most important problems in and for the discipline.

As James Rosenau puts it, “the notion of ‘international relations’ seems obsolete when so many of the interactions that presently sustain world politics do not unfold directly between nations or states.”10 Jens Bartelson concurs with this assessment: “if the state ever really became obsolete as some theorists of International Relations imagine, this would spell the end not only of their domain of inquiry, but also of their intellectual autonomy vis-à-vis adjacent disciplines.”11 And yet, despite the fact that a small library could be filled with works on the ‘state of the state’ in the globalization era, there is very little agreement on what is going on and the cacophony of views is astonishing. “Will the state die? Is the state dying? Is it perhaps already dead? Despite many arguments back and forth” Ringmar notes, “it has been excruciatingly difficult to settle this issue in a conclusive fashion. Regardless of which position we take there seems to be ample empirical evidence in our support.”12 It seems indeed that for each observer’s claim that a fundamental transformation of the state system is underway we can find another’s suggestion that these changes are illusory and that the sovereign state remains alive, well, and unchanged. A cursory review of the most salient

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10 Rosenau 1989: 3.
claims on each side of the debate reveals the bewildering variety of positions on these questions. This is a literature that, as Kalevi Holsti puts it, “is far too vast and undisciplined to warrant any sort of generalization.”

_Challenges to the international system._ Notwithstanding this diversity, two main contending discourses can be discerned. On the one hand, many observers argue that the sovereign state is under siege, challenged on all sides by the forces of economic globalization and other contemporary global processes, such as the rise of humanitarian norms, the spread of nuclear weapons, the rise of non-state violence, and global warming, to name just a few. Under the weight of these pressures, the state is ‘losing control,’ ‘defective,’ ‘declining,’ ‘retreating,’ ‘obsolete,’ and even ‘ending.’ Despite these serious challenges, however, a number of observations – the universal expansion of the state form, the strength of territorial sovereignty norms and the fact that statehood remains the ultimate aspiration of most non-state actors today – suggest that the state remains alive and well. These observations are puzzling from the perspective of the globalization theorists, who, relying on rough evolutionary frameworks privileging exogenous environmental pressures, are forced to admit that, given the magnitude of the transformation that have occurred in the environment of the system, it _should_ have changed more deeply than it has. After painstakingly testing a number of propositions about the contemporary state of the state in the face of globalization, Norrin Ripsman and TV Paul conclude that “none of the

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13 Holsti 2004: 5.
14 For general reviews, see Evans 1997; Kahler 2000; Sassen 2006; Deudney 1995; Ohmae 1995; Strange 1996; Van Creveld 1999.
dominant international theoretical perspectives seem fully able to capture the current state of the world with respect to globalization.”\textsuperscript{15} 

Perceptions that the survival of the international system is threatened are not entirely new. Revolutionary Great Powers have periodically threatened the ‘repose’ of other powers and smaller states in the international system.\textsuperscript{16} In their times, Napoleonic France and Hitlerite Germany were seen by balance-of-power statesmen and scholars as formidable threats to the survival of the international system.\textsuperscript{17} As Robert Jervis and Randall Schweller have suggested, the revisionist state has been a key driver of international politics, and determining true revisionists from merely insecure status quo defenders, a quintessential challenge of statecraft.\textsuperscript{18} 

Following the end of the Second World War, announcements of the impending demise of the sovereign state system were renewed by the advent of nuclear weapons. Indeed, in the early stages of the nuclear revolution, an impressive collection of observers, including some of the founders of modern IR, such as Hans Morgenthau, John Herz and Kenneth Boulding, strongly believed that nuclear weapons had stripped away the state’s ability to secure itself by its own means, thereby making it obsolete from a security-functional perspective.\textsuperscript{19} As

\textsuperscript{15} Ripsman and Paul 2010: 177.
\textsuperscript{17} Mitzen 2013.
\textsuperscript{18} Schweller 1998.
\textsuperscript{19} Herz 1959; Morgenthau 1964; Boulding 1962; For reviews, see Deudney 1995. The Realists’ visions of world government are reviewed in Scheuerman 2011. Also see Speer 1968; Rosecrance 1981; Kaplan 1983.
recently as the 1980s, these ideas were echoed by prominent figures such as Ronald Reagan and Mikhail Gorbachev.\textsuperscript{20}

In the words of Daniel Deudney, “nuclear weapons fundamentally challenge the real-state because they deny the possibility that a political order of less than universal scope can monopolize violence capability within its territory.”\textsuperscript{21} The major change, as Thomas Schelling puts it, is that, while before the bomb, armies had to be defeated on the field, after the bomb, punishment of the enemy population could be carried out without achieving prior military victory.\textsuperscript{22} In the face of nuclear weapons against which one cannot defend, a number of scholars believed that states had lost their monopoly over the means to coerce their own populations. “Nuclear weapons,” Deudney concludes, “are to the real-state what gunpowder was to the medieval fief: a technology that renders it militarily inviable.”\textsuperscript{23}

Today, this sense of urgency about global reform has been marginalized in IR and security policy circles. But while contemporary references to a ‘nuclear taboo’ and a ‘tradition of nuclear non-use’ suggest that nuclear weapons have been ‘normalized’ in the public imagination, that ‘we have learned to stop worrying and love the bomb,’\textsuperscript{24} recent worries about the possibility of nuclear use by rogue states and terrorist organizations have renewed scholars’ and policymakers’ fears

\textsuperscript{20} Deudney and Ikenberry 1991/92.
\textsuperscript{21} Deudney 1995: 214.
\textsuperscript{22} Schelling 1962.
\textsuperscript{23} Deudney 1995: 214.
\textsuperscript{24} Tannenwald 2002; Paul 2009. On the history of political and strategic thought about nuclear weapons see Freedman 2003.
and their interest in the implications of nuclear weapons for the viability of the state. The main worry is now that, unlike what we have come to expect from nuclear-armed states, rogue states and terrorists cannot be similarly deterred and cannot be expected to exercise similar restraint were they to acquire nuclear weapons.\textsuperscript{25} Notwithstanding the question whether terrorists can be deterred or not and whether ‘rogue’ nuclear states would even have incentives to use or give away their nuclear weapons to terrorist organizations in the first place, as US President George W. Bush assumed the Iraqi dictator Saddam Hussein was likely to do in 2003, it is easy to imagine how the actual use of nuclear weapons by a terrorist group would shake the collective belief in the state’s ability to protect its population that underpins the state’s authority.\textsuperscript{26}

The most influential contemporary discourses about the impending demise of the state, however, point to how the myriad processes associated to the phenomenon of globalization undermine the state’s ability to control cross-border exchanges and perform traditional security and welfare functions. In a nutshell, “globalization renders territorial boundaries irrelevant – or in the more cautious versions which have become increasingly prominent, less significant” and “nullifies the cultural, political and technical boundaries that defined distinct worlds, isolated some social relations from world markets, and inhibited communications.”\textsuperscript{27}

\textsuperscript{25} For a critique of this widespread assumption, see Trager and Zagorcheva 2005/6.
\textsuperscript{26} Mendelsohn 2005.
\textsuperscript{27} Shaw 2000.
In the economic realm, investment, industrial production, information and consumption flows are seen as increasingly cutting across, rather than being contained by, the borders of the international political map. The state, the great ‘territorial container,’ appears to be leaking.\textsuperscript{28} This literature is immense and I can only cite a few suggestive examples, such as Susan Strange’s suggestion that “the impersonal forces of world markets, integrated over the postwar period more by private enterprise in finance, industry and trade than by the cooperative decisions of governments, are now more powerful than the states to whom ultimate political authority over society and economy is supposed to belong.” “Where states were once the masters of markets,” she concludes, “now it is the markets which, on many crucial issues, are the masters over the governments of states.”\textsuperscript{29} Kenichi Ohmae concurs that these developments “have raised troubling questions about the relevance – and effectiveness – of nation states as meaningful aggregates in terms of which to think about, much less manage, economic activity.”\textsuperscript{30} Saskia Sassen goes further and argues that “today, the major dynamics at work in the global economy carry the capacity to undo the particular form of the intersection of sovereignty and territory embedded in the modern state and the modern state system.”\textsuperscript{31} As Robert Gilpin notes, “in a highly

\textsuperscript{28} Agnew 1994.
\textsuperscript{29} Strange 1996: 4.
\textsuperscript{30} Ohmae 1995: viii.
\textsuperscript{31} Sassen 2006: 5.
integrated global economy, the nation-state, according to some, has become anachronistic and is in retreat.”

In the security realm, observers note the rise and/or return of violent non-state actors – pirates, mercenaries, private military companies and terrorists. While they have always been around, their greater ability to exploit the globalization of the means of communication and transportation to enhance the reach, organization and funding of their operations, combined with their increasingly greater access to small arms, explosives and, potentially, nuclear weapons, have made it increasingly possible for them to challenge states and increasingly costly for states to fight and defeat them.

The state’s difficulties controlling non-state actors is evidenced by the growth in the number of so-called ‘ungoverned spaces,’ areas where the state lacks ‘effective’ sovereignty, enabling other actors and forms of governance to emerge and compete with the state, and in many cases, establish alternative authority structures. In 2006, the World Bank estimated that the number of states lacking effective sovereignty had climbed from 17 to 26 in the three years since the previous report in 2003. Data from the latest Failed State Index report

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33 Thomson 1994; also see Percy 2007.
34 Singer 2003.
36 The concept of ‘ungoverned space’ is contested. Many authors prefer the concept of ‘alternative authority and governance structures,’ to denote the state-centered bias (the implication that the absence of state means the absence of authority/governance) inherent to the former concept. See Clunan 2010. Ungoverned spaces are not necessarily territorial. Threats from cyberspace are also increasingly seen as eluding state control and presenting a fundamental challenge for the state. See Palan et al. 2001.
37 DeYoung 2006.
(2013) reveals that 59 out of 193 states are ‘failing’ or are considered to have ‘failed.’\textsuperscript{38} At the moment of this writing, the international community is engaged in a ‘long’ struggle to fight ISIS, a non-state Islamic group based in a large ungoverned territory that spans significant portions of Syria and Iraq. This new campaign occurs after more than 13 years of struggle against a variety of sub-state actors over the control of the Iraqi state following the defeat and overthrow of Saddam Hussein’s regime. Meanwhile, the situation is not much rosier in Afghanistan where the central government and NATO forces continue to struggle, more than 15 years after overthrowing the Taliban regime, to control non-urban areas.

Meanwhile, changes in the state system’s natural environment, such as global warming, have so far eluded comprehensive interstate cooperation.\textsuperscript{39} Yet, it is not very difficult to imagine the effect a series of cataclysms produced by global warming would have on the legitimacy of the state and the state systemic form of global political organization.

Finally, in the normative-legal realm, the rise of global cosmopolitan discourse has generated pressures to give individuals status in international law, which are generally seen as challenging its state-centric foundation, and therefore, state sovereignty.\textsuperscript{40} Two discourses about global cosmopolitanism can be discerned. A more moderate discourse suggests that the spread of humanitarian norms has

\textsuperscript{38} Failed States Index 2013.
\textsuperscript{39} For a short review, see the following introduction to the symposium on ‘Global Environmental Change and the Nation-State’ in the journal \textit{Global Environmental Politics}. Biermann and Dingwerth 2004.
\textsuperscript{40} Coplin 1965; Krisch 2010.
constrained the state’s ability to pursue traditional coercive policies, such as war, by limiting the purposes and means of state violence.\textsuperscript{41} A more radical discourse, however, sees global cosmopolitanism as displacing the state as the fundamental unit of world politics.\textsuperscript{42} “The national constellation,” Michael Zürn suggests, “that is the convergence of resources, recognition and the realization of governance goals in one political organization – the nation state –, seems to be in a process of transformation into a post-national constellation. The nation state is no longer the only site of authority and the normativity that accompanies it.”\textsuperscript{43}

The crisis in state authority. Compounding (and perhaps as a result of) these adverse trends, which are purportedly undermining the state’s ability to perform key security and welfare functions, a number of observers have diagnosed a corresponding crisis in the state’s authority and ability to mobilize the loyalties of its citizens.\textsuperscript{44} Strange argues that the state “can no longer make the exceptional claims and demands that it once did” and that “it is becoming, once more and as in the past, just one source of authority among several, with limited powers and resources.”\textsuperscript{45} Globalization and the delegitimation of war, by constraining the state’s capacity to perform key functions deeply attached to its identity, have undermined state authority. “The globalization debate involves legitimacy issues of the deepest sort, because it is fundamentally about identity, that is, about who should (and who is competent to) have the authority to act and make decisions in

\textsuperscript{41} Simmons 2009. Goldstein et al. 2001.
\textsuperscript{42} Dunoff and Trachtman 2009.
\textsuperscript{43} Zürn 1999.
\textsuperscript{44} Lipschutz 2000.
\textsuperscript{45} Strange 1996: 73.
global and local economic affairs.” 46 “The loyalty given to the state is, in general, no different in degree from the loyalty given to the employer. Apart from professional soldiers, people in stable political societies do not expect to have to sacrifice their lives for anyone – except perhaps their families.” 47 Martin Van Creveld, the great military historian, echoes this view: “The devil’s bargain that was struck in the seventeenth century, and in which the state offered its citizens much improved day-to-day security in return for their willingness to sacrifice themselves on its behalf if called upon, may be coming to an end.” 48

Globalization theorists argue that these fundamental transformations in the environment of states are happening at such a rapid pace that they have outstripped the ability of comparatively slow and cumbersome states to adapt to and manage these processes. Strange thus believes that we are in the midst of a ‘Great Transformation’ occurring at an unprecedented pace and of a magnitude only matched by the demise of feudalism:

“That all or nearly all states should undergo substantial changes of roughly the same kind within the same short period of time is really a new phenomenon. Even the last big change in Europe, from states based on a feudal system of agricultural production to states based on a capitalist system of industrial production, was spread over two or three centuries. It did not take place as quickly or as evenly as the changes recently experienced by the vast majority of states over the last twenty or so years.” 49

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48 Van Creveld 1999: 408.
The universal expansion and entrenchment of the international system. Despite the calls of the Cassandras, remarkable elements of continuity in the international system provide a sharp and puzzling contrast with the claims about the obsolescence of the state system. Indeed, since 1945, in spite of all of these challenges, the state system has expanded to become universal and territorial sovereignty norms have become so entrenched that state borders appear permanently fixed. With the international community’s recognition of the independence of Palau in 1994, the international system, which is today composed of more than 193 states, has become truly global in scope.50 “We live in the world’s first global system of states: no polities or peoples lie outside its reach.”51 The global spread of the sovereign state system from its European origins has been the product of the successive waves of decolonization and the demise of the Soviet Union. These ‘critical junctures’ have not led to the emergence of new forms of political organization that could rival the sovereign state, but have instead contributed to the reproduction and expansion of the state system. The European Union (EU) appears to be an exception, but it remains too early to tell, as the future of the EU remains, like that of the state system itself, in question and intensely debated.52 It does not seem as if the universalization of the state is going to be reversed in the near future. Despite claims about the emergence of alternative forms of governance below the state, the recognition of

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50 The independence of Palau marked the completion of the United Nations’ Trusteeship Council’s mandate. From that point onward, there is no piece of territory on the globe’s surface that does not belong to a state or that is not subject to an inter-state treaty.
51 Reus-Smit 2013: 2.
52 Caporaso 1996; Howorth 2010.
their statehood by the international community remains the ultimate aspiration of stateless peoples, such as Palestinians, Chechens and Kurds.\footnote{Coggins 2014.}

Indeed, the claim that the territorial containers are being submerged remains indiscernible on the international political map, which has remained extremely stable since the flurry of state creation that followed the demise of the Soviet Union. Since the end of the Second World War, state death as a result of conquest has become extremely low, with South Vietnam representing the only exception.\footnote{I exclude cases of non-violent state death (e.g. the Soviet Union and Yugoslavia). Fazal 2007.} Countries like Japan, Germany, Kuwait and Iraq have experienced complete military defeat, foreign military occupation, and have since had their full sovereignty restored. Meanwhile, territorial sovereignty is almost always upheld, even in the puzzling case of the weak African states who have inherited ‘artificial’ borders from colonialism.\footnote{Jackson and Rosberg 1982; Jackson 1993.} Territorial sovereignty norms have become so entrenched that war, which for centuries had represented the main engine of international political change,\footnote{Gilpin 1981.} has virtually ceased to lead to territorial change. If before 1945, 80 percent of wars had led to territorial change, between 1945 and 1975, only 30 percent of wars have involved territorial change, and between 1975 and 2000, there has not been a single case of war leading to territorial change.\footnote{Zacher 2001.} States are more ‘solid’ than ever from that standpoint.\footnote{Ibid.} Since 2000, Kosovo and the ongoing crisis in the Ukraine (and particularly Russia’s annexation of Crimea) represent notable exceptions to this trend. Whether they signal a new trend

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\footnote{Coggins 2014.}
\footnote{I exclude cases of non-violent state death (e.g. the Soviet Union and Yugoslavia). Fazal 2007.}
\footnote{Jackson and Rosberg 1982; Jackson 1993.}
\footnote{Gilpin 1981.}
\footnote{Zacher 2001.}
\footnote{Ibid.}
remains to be seen, but the fact that they have generated so much controversy over whether they are setting new precedents illustrates their exceptional character in the contemporary era.

Finally, but most crucially, individual states have probably been safer than they have ever been. Inter-state war, the main driver of international politics for centuries, appears to be on the verge of disappearing completely. The environment constituted by inter-state relations appears to have become particularly benign, in sharp contrast with the harsh conflictual environment Realism leads us to expect. While inter-state wars of all magnitudes have significantly declined over the course of the last couple of centuries, and particularly since 1945, the most striking observation is the complete absence of wars opposing major states in the sixty-two years since the end of the Korean War (1950-53).59 War and the balance of power have given way to multilateralism as the expected way of dealing with security matters, with the use of force increasingly channeled both in law and practice through the United Nations (UN) Security Council.60

Not only has the international environment become particularly safe, but growing international cooperation and organization has also increased the net benefits from statehood and the resources available to states, such as international assistance and loans.61 Thus, rather than constituting a threatening environment

60 Thompson 2009; Pouliot 2011.
61 Fazal and Griffith 2014.
for individual states, making their lives “solitary, poor, nasty, brutish, and short.”\textsuperscript{62} Membership in the contemporary international system seems more aptly described as a ‘club good,’ carrying privileges that can significantly increase their well-being and security.\textsuperscript{63} In this context, typical security concerns have largely shifted from individual states fearing other states in the international environment to the international community’s collective apprehensions about violent non-state actors and other threats and risks lying outside the boundaries of the international system itself, such as poverty, diseases, radicalism and climate change, to name a few.\textsuperscript{64}

\textit{System-environment endogeneity}. In between these two extremes, many have also observed that the relationship between the state system and some of these globalizing processes is complex and to a significant degree endogenous. For instance, Linda Weiss argues that the assumption that globalization processes have their origins in technological developments in the means of communication and transportation is misguided. She suggests that the term ‘internationalization’ replace globalization to denote how adaptive states have actually led many of the transformations that constitute globalization.

“So-called ‘globalization’ needs to be viewed as a politically rather than technologically induced phenomenon. It is political, first, in the general sense that the opening up of capital markets has occurred as a direct result of governments, either willingly or

\textsuperscript{63} Here and in the rest of this dissertation, by ‘state’ I am strictly referring to the corporate actor and its government. The case of Somaliland illustrates how what benefits the state does not necessarily benefit its population.
\textsuperscript{64} Krasner 2004; Fearon and Laitin 2004.
unwillingly, ceding to pressure from financial interests, seeking to prevent international crises, and eschewing implementation of effective controls. But it is political also in the more specific sense discussed here: that a number of states are seeking directly to promote and encourage rather than constrain the internationalization of corporate activity in trade, investment and production. From this perspective, the internationalization of capital may not merely restrict policy choices, but expand them as well.”

These new policy instruments, Weiss argues, have in many cases strengthened rather than weakened states capacity vis-à-vis their economic environment. “To the extent that states are seeking to adapt and reconstitute themselves in these ways, they can perhaps best be seen as ‘catalytic.’... Catalytic states seek to achieve their goals less by relying on their own resources than by assuming a dominant role in coalitions of states, transnational institutions and private-sector groups.” Thus, “far from relinquishing their distinctive goals and identity, states are increasingly using collaborative power arrangements to create more real control over their economies (and indeed over security).”

The positive relationship that has been observed between greater exposure to foreign trade and the larger size of governments supports these arguments.

A paradigm in crisis

The best evidence of the persistence of the state, however, is perhaps the difficulty we have in imagining a world after the state. Given the magnitude and

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65 Weiss 1998: 208. Also see Haggard and Kaufman 1992; and Boyer and Drache 1996.
66 Weiss 1998: 209. As Ripsman and Paul point out, these arguments echo Karl Polanyi’s ‘double movement’: the side-effects of the expansion of markets have been met by corresponding state responses to protect society from dislocation, thereby strengthening the state in the process. Ripsman and Paul 2010; Polanyi 2001.
rapidity of contemporary changes in the sovereign state system’s ‘environment,’ the sovereign state and its practices decidedly have an anachronistic air. Yet, while we sense the apparent disorder and corresponding ‘funk de siècle’\textsuperscript{68} malaise, this does not mean that we can easily think about ‘post-international politics,’ as James Rosenau encouraged us to do.\textsuperscript{69} Randall Schweller, whose previous work represented a fine example of problem-solving science, ‘refining but not refuting’ Waltzian structural realism,\textsuperscript{70} recently threw his hands up in despair and declared the demise of the international system and international politics as we know them. The international system, he argues, is descending into an ‘Age of Entropy’ in which “chaos and randomness abound” and “the story of world politics unfolds without coherence, unfettered by classic balance-of-power politics, a plotless postmodern work starring a menagerie of wildly incongruent themes and protagonists, as if divinely plucked from different historical ages and placed in a time machine set for the third millennium.”\textsuperscript{71} Unlike Schweller, however, few IR theorists have elected to embrace chaos. For the most part, IR scholars have elected to continue assuming the unproblematic existence of the sovereign state in practice, working ‘from’ the state and thereby making it even more difficult to think critically ‘about’ it.\textsuperscript{72} “In most instances, the existence of a system of more or less distinct territorial units as the foundation for human

\textsuperscript{68} See Ikenberry 1995.
\textsuperscript{69} Rosenau 1989.
\textsuperscript{70} See Schweller 1997. His refinements of Waltz are developed in two widely cited books. See Schweller 1998; Schweller 2006.
\textsuperscript{71} Schweller 2010.
\textsuperscript{72} Cederman and Daase 2003.
governance is not even questioned.”\textsuperscript{73} We are not alone to do that, as \textit{thinking from} the state is a phenomenon we encounter across the social sciences, an intellectual habit that Ulrich Beck calls ‘methodological nationalism’ and John Agnew, the “territorial trap.”\textsuperscript{74}

Admittedly, the IR discipline is today about much more than the relations among states. IR scholars have been increasingly interested in relations occurring within and across state boundaries and in studying complex relations involving both state and non-state actors of different types.\textsuperscript{75} To a great extent this is a reflection of the various trends I have discussed in this section. Yet, these works have not challenged the fundamental picture of the international system, but merely enriched it by grafting new actors, institutions and processes to its basic structure. Absent a reevaluation of the fundamental categories we use to think about world politics, however, the shift in IR scholars’ attention to these new areas of research does not necessarily mean that the discipline has escaped its crisis, but may only represent one of its symptoms.

Science, except in rare revolutionary moments, is \textit{normally} a fundamentally conservative practice, as the epigraph from Thomas Kuhn at the beginning of this chapter suggests. We become invested in our theories and have difficulty giving up on them in the face of disconfirming evidence. This is not necessarily irrational. Theoretical ‘paradigms’ perform a necessary role in the formulation of

\textsuperscript{73} Murphy 1996: 81.  
\textsuperscript{74} Agnew 1994; Beck 2000.  
\textsuperscript{75} Raustiala and Victor 2004.
scientific problems and of their solutions. They also offer a common language and common standards that enable communication across the scientific community. As such, they have intrinsic value and are worth defending, up to a point.

These observations about the role and importance of theory are even more relevant in a scientific discipline like International Relations (IR), where units and structures, being social facts, are fundamentally unobservable outside of their symbolic representations. This is particularly true in the case of the international system. Indeed, judging by the appearances, the international system lacks the tangible markings that make it possible for us to think we can ‘see’ the state. It has no armies, no capitol, bureaucracy, central bank, flag, or passport, and no clearly demarcated border on a map. This does not mean that the international system does not have reality and that it cannot produce effects that we can see. Most IR theories posit the international system as existing and as having effects on states and other actors. Theorizing the international system and its effects, however, requires us to imagine the international system in the first place. It follows, then, that how we imagine the international system plays a very important role, not only for IR theory, but also for international political practice.

At some point, however, a paradigm’s blind spots can become greater than the areas it illuminates, signaling that it has become time to move on. In a way, this is unavoidable. Paradigms offer simplified pictures of a complex world and, as

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76 See Wendt 1999: ch. 2.
such, are bound to accumulate puzzling anomalies over time. Puzzle-solving is the stuff of normal scientific activity. Puzzles call for theoretical refinements, and as long as they can be solved without contradicting core assumptions, changes in the paradigm constitute a form of scientific progress.\footnote{On progressive and degenerative problemshifts, see Lakatos 1970.} We know a paradigm has probably reached the end of its useful life, however, when it has become better at identifying puzzles than it is at addressing them on its own theoretical terms. These periods of ‘crises,’ during which unsolved puzzles become nagging anomalies and ‘ad hoc’ theoretical refinements begin diluting the core assumptions of the paradigm, call for a new paradigm.

Paradigm shifts, however, are not easy for anyone involved. The old paradigm offers well-marked tracks to follow and has become the commonsensical way of looking at the world. The paradigm is presented and taught in textbook accounts, and the contested, debated and deeply problematic character of assumptions elided or presented in a way that makes the paradigm’s triumph appear inevitable. How and why this occurs can be explained by a variety of psychological and sociological reasons, not the least of which is the fact that some of the initial success of the paradigm in capturing the scientific community’s imagination generally came from its compatibility with other entrenched, commonsensical and/or theoretical ways of looking at the world. Ptolemy’s earth-centric picture of the universe, for instance, held much more commonsensical appeal than Copernicus’ heliocentric view. Not only was it compatible with religious doctrine, but it was also remarkably successful at predicting the location
of stars, which explains why it has remained a useful instrument of navigation to this day. But perhaps most importantly, the Ptolemaic picture was closer to our everyday experience of the world. Indeed, it does not seem to us at all like the earth is moving around the sun, quite the contrary; from our earthly perspective, it is the sun that appears to rise and set in the course of a day.\textsuperscript{78}

In many instances, thus, scientific progress has necessitated moving away from our everyday intuitions, often in dramatic ways. The revolution in our worldview that flows from quantum mechanics, for instance, turns almost everything we think we know about the world on its head.\textsuperscript{79} Later in this introduction, I will show how new biological theories have thoroughly challenged the way we think about human individuality, among other things, enabling us to significantly expand our imagination. This is the power of good scientific theories: by constructing an ontology that is at odds with our everyday experience of the world, they enable us to penetrate beyond appearances to isolate the hidden mechanisms generating these appearances.

Nagging, inconclusive empirical debates should thus call for the reevaluation of shared background concepts and theories. The history of science tells us that paradigmatic crises will not find resolution from within the confines of the paradigm itself. In times of crisis, paradigms are better at raising puzzles than they are at solving them.\textsuperscript{80} The dominant response to crisis in IR has been to go

\textsuperscript{78} Kuhn 1957.
\textsuperscript{79} See Wendt 2015.
\textsuperscript{80} Kuhn 1962.
on as if the monumental questions about the status of our fundamental units of analysis were not even being asked. As a result, we find ourselves in an uncomfortable position where the central and legitimating piece of our scientific ontology might be fundamentally changing under our nose and we may very well be the last ones to know.

Considering the importance of the international system for the legitimacy of our discipline, we should be devoting more time and resources to understanding its character and its transformative potential in the face of contemporary changes. Why we do not is an interesting puzzle in its own right. Indeed, as Strange points out,

“paradoxically (or perhaps understandably), the ... view that human society is undergoing major structural changes that also affect the place and function of states in their relations with each other is more evident among scholars who are not specialists in international relations.... It almost seems as though the resistance of writers on international relations comes from their vested interest in an academic discipline which would hardly exist as a separate specialism if states were shown to be less dominant than they used to be.”81

This resistance is unfortunate from the perspective of IR as a discipline, I think, because the international system is probably the most distinctive concept in our repertoire. Other social scientific disciplines, beside IR, write about the state, war, peace and cooperation. It has also been said that IR is a ‘borrowing discipline’ that has not really produced original theory, and there is much truth to

that. Yet if there is a genuinely ‘IR’ concept it is the international system. IR is the scientific discipline that specializes in the study of the international system and associated phenomena. This time of crisis is thus ripe for questioning the ontology of the international system. Developing a theory of the international system that could help us and the other social sciences comprehend its transformative potential in the face of the forces of globalization represents perhaps the greatest contribution we could make to the interdisciplinary conversation about the effects of globalization.

The Darwinian perspective on the international system

But where should we begin? As Wendt suggests, a long-standing assumption in philosophy is that when debates persist for a long time without progress, one should look for what the different positions share in common. In this dissertation, I take this approach and target a widely shared set of assumptions about the ontology of the international system in IR: the Darwinian perspective on the international system, in which the ‘anarchic’ international system is viewed simultaneously as a population of individual states that simultaneously constitutes these states’ primary security environment. While there is much disagreement about the future of the international system, most IR scholars share this ontology of the international system. This conception of the international system, however, rests to a large extent on a number of traditional

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82 Jervis 1989.
83 See Wendt 2015: 2, 29.
and commonsensical assumptions about the nature of real individuality in world politics which have the effect of limiting the kind of structures and agents we can see.

Problematizing the dominant ontology of the international system is a promising starting point. Because the effect of an environmental stimulus depends on the constitution of the system it is said to affect, understanding the contemporary and future impact of globalization on the transformation of the international system requires us to inquire into the character of the international system. At the same time, knowing how the international system changes will tell us a number of interesting things about what the international system is.

In recent decades, many IR scholars have turned to evolutionary biology in order to frame these questions of ontology. A particularly common approach has been to frame the international system in Darwinian terms, as an anarchic population of state individuals that simultaneously constitutes these states’ primary security environment. In what remains the most influential typology of international system change, Gilpin frames the question of ‘systems change’ – change in the kind of entities that populate the international system – as “why one or another type of entity is best suited for a particular historical environment.” The two most-influential accounts of systems change, Charles Tilly’s and Hendrik Spruyt’s, propose similar evolutionary models in which the sovereign state was ultimately selected through military and economic competition, the terms of

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85 Gilpin 1981, 41.
which were transformed by exogenous changes in military technology and the volume of trade, respectively.  

As Ann Florini notes, “most accounts of the formation of states and the European state system are, at least implicitly, theories of evolution by natural selection.”

Darwinism is widely assumed to support Realism’s pessimistic, tragic view of the international system as a fundamentally competitive and conflictual environment over which individual states only exert limited control. “Realism,” Bradley Thayer observes, “like the Darwinian view of the natural world, submits that international relations is a competitive and dangerous realm, where statesmen must strive to protect the interests of their state through an almost constant appraisal of their state’s power relative to others.” Darwinism thus “provides a firm scientific foundation for the realist argument that egoistic and dominating behavior is a result of human evolution.” Jennifer Sterling-Folker thus concurs that “the very ontology to which all realist IR theory subscribes is Darwinian evolutionary biology.”

The international system as Darwinian population

In diachronic accounts of international system transformation, which seek to explain the emergence of states and subsequent changes in the system’s

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86 Tilly 1990; Spruyt 1994.
89 Thayer 2004: 11.
90 Thayer 2000: 150.
91 Sterling-Folker 2002: 79.
composition and behavioral patterns, the system is assumed to be analogous to a Darwinian population (of states) evolving primarily through competition and conflict. As its name suggests, IR is at its core about the interactions of states and the (inter-national) system that these interactions constitute. As Samuel Barkin and Bruce Cronin put it, “theoretical traditions that agree on little else all seem to concur that the defining feature of the modern international system is the division of the world into sovereign states.”92 Thus, the most widely and deeply taken for granted assumption of IR theory is that the structure of the international system is anarchic. The ‘anarchy problematic’93 that this assumption yields have framed many of the discipline’s core debates over the years. It has been so influential that, as Michael Barnett and Kathryn Sikkink rightly point out, “the study of international relations has largely concerned the study of states and the effects of anarchy on their foreign policies”94 Whether it is characterized as a ruthless ‘self-help’ environment,95 as an obstacle to sustained cooperation,96 as ‘what states make of it,’97 or as a ‘society,’98 the description of the international system as a horizontal, anarchic plane is itself rarely questioned;99 different ‘logics of anarchy,’ perhaps, but anarchy nonetheless.100

93 Ashley 1984.
95 Waltz 1979.
96 Oye 1986.
99 For the exception to this rule, see Donnelly 2009; Donnelly 2012. Also see the literature on emerging ontologies, practices, networks and processes. For a discussion, see Jackson and Nexon 1999.
100 Buzan et al. 1993.
Even the recent literature identifying, describing and explaining important hierarchical relations in IR,\textsuperscript{101} which at first sight appears to challenge the assumption of anarchy, continues to take preexisting states as its starting point. The constitution of international hierarchies is almost universally interpreted through an individualist-statist ontology in which states are assumed to have an existence that is prior and independent from the hierarchical relations that they contract into.\textsuperscript{102} Anarchy, in other words, is assumed to come before whatever hierarchy exists in the system, hence titles like “Hierarchy \textit{under} Anarchy”\textsuperscript{103} and “Hierarchy \textit{in} Anarchy.”\textsuperscript{104}

For Neorealists, Neoliberals, and most English School and Social Constructivists scholars, the state is taken to be, to use Ashley’s apt formulation, “ontologically prior to the international system.”\textsuperscript{105} As Kenneth Waltz defines them, “international-political systems, like economic markets, are individualist in origin, spontaneously generated, and unintended.”\textsuperscript{106} “International structures,” he writes, “are defined in terms of the primary political units of an era, be they city states, empires, or nations.”\textsuperscript{107} Neoliberals do not challenge this picture of the international system as an economic market, although they see more room for


\textsuperscript{102} Wendt 1987.

\textsuperscript{103} Wendt and Friedheim 1995.

\textsuperscript{104} Donnelly 2006.

\textsuperscript{105} Ashley 1984: 240.

\textsuperscript{106} Waltz 1979: 91.

\textsuperscript{107} Ibid: 91.
cooperation and institutionalization within that market.\textsuperscript{108} Analytical Liberalism makes this individualist take on the system even clearer by insisting that the formation of state preferences takes analytical precedence over system-level analysis.\textsuperscript{109}

The English School and most mainstream Constructivists also share this individualist ontology of anarchy. Like Neorealism, the English School posits that, in the words of its founder Hedley Bull, “the starting point of international relations is the existence of states, or independent political communities each of which possesses a government and asserts sovereignty in relation to a particular portion of the earth’s surface and a particular segment of the human population.”\textsuperscript{110} The state is the more fundamental entity in the state-system-society triad. In Bull’s theorization, thus, an international system emerges when preexisting states need to take each other into account in their interactions,\textsuperscript{111} and an international society, when states in a system agree to observe common rules of coexistence out of shared interest; states in a system form a society when they ‘contract’ into one.\textsuperscript{112}

Mainstream Constructivists also buy into this ontology of the international system. While in “The Agent-Structure Problem,” Wendt had critiqued the individualist ontology of the state system and suggested theorizing “directly about the generative structures of the world and domestic political-economy

\textsuperscript{108} Keohane 1984.
\textsuperscript{109} Moravcsik 1997.
\textsuperscript{110} Bull 1977: 8.
\textsuperscript{111} Ibid: 9.
\textsuperscript{112} Bull and Watson 1984.
which constitute states as particular kinds of agents with certain causal powers and interests,”¹¹³ in “Anarchy is What States Make of It,” and later in *Social Theory of International Politics*, he leaves the ‘corporate identity’ of the ‘essential state’ unproblematic in order to focus on variation in the role identities states can take in different ‘cultures of anarchy.’¹¹⁴

Wendt’s theorization provides the clearest statement of the assumption that the international system is a Darwinian population. At the level of states’ role identities as ‘enemy, rival or friends,’ ‘anarchy is what states make of it.’¹¹⁵ Alter and Ego, however, enter the process of social construction of their ‘role’ identities already fully constituted at the level of their ontologically more fundamental ‘corporate’ identity, a distinction that underpins the argument that ‘states are people too.’¹¹⁶ Thus, “the state is pre-social relative to other states in the same way that the human body is pre-social. Both are constituted by self-organizing internal structures, the one social, the other biological.”¹¹⁷ “Sovereignty,” he concludes, “is intrinsic to the state, not contingent.”¹¹⁸

*The international system as Darwinian environment*

In synchronic accounts of international politics and foreign policy, on the other hand, the international system is assumed to be analogous to a Darwinian environment, setting constraints on state action by punishing or rewarding

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¹¹³ Wendt 1987: 344.
¹¹⁴ Wendt 1987, 1992, 1999; for a critique along those lines see Cederman and Daase 2003.
¹¹⁶ Wendt 1999: ch.5; Wendt 2004.
¹¹⁸ Ibid: 209.
different types of state behaviors.\textsuperscript{119} The international system is generally understood, analytically, as an anarchy that constitutes the primary security environment for individual states. “The units of greatest of greatest capability,” Waltz writes, “set the scene of action for others as well as for themselves.”\textsuperscript{120} As David Dessler observes, Neorealism’s international “structure is an environment in which action takes place. Structure means the ‘setting’ or ‘context’ in which action unfolds.”\textsuperscript{121}

The intentions and behavior of other states are generally considered to be most consequential to the life of the state, the anarchic character of this environment is assumed to bias the system towards competition, and the states that populate it are assumed to tend towards selfishness. “Internationally,” Waltz writes, “the environment of states’ action, or the structure of their system, is set by the fact that some states prefer survival over other ends obtainable in the short run and act with relative efficiency to achieve that end.”\textsuperscript{122} Realists view the environment constituted by inter-state relations in Darwinian terms, as a struggle for survival. “Realism,” Thayer observes, “like the Darwinian view of the natural world, submits that international relations is a competitive and dangerous realm, where statesmen must strive to protect the interests of their state through an almost constant appraisal of their state’s power relative to others.”\textsuperscript{123}

\textsuperscript{119} Waltz 1979. For a discussion of the assumption that the international system is a Darwinian environment, see Dessler 1989; Sterling-Folker 1997; and Thayer 2004.
\textsuperscript{120} Waltz 1979: 72.
\textsuperscript{121} Dessler 1989: 466.
\textsuperscript{122} Waltz 1979: 92–93.
\textsuperscript{123} Thayer 2004: 11.
As I will explain in greater detail in my critique of evolutionary IR in chapter 4, two distinguishing features of Darwinism are the primary role assigned to the (exogenous) environment in determining the selection of individuals and those individuals’ lack of agency in selection. The Darwinian perspective assumes that the costs and benefits of a given form of political organization have exogenous determinants (technological, economic, normative or other). Following a change in these exogenous factors, maladapted organizations are expected to “fall by the wayside” and to be replaced by better adapted ones.\textsuperscript{124} Over time, organizations that are better adapted to the new set of environmental demands should represent a greater share of the overall population.

For environmental selection to retain explanatory primacy, however, Darwinism must assume that individual-level variation, although necessary, is somewhat ‘random,’ in the sense of being undirected towards long-term fitness. Natural selection has the last word on evolution and is thus said to be the creative force behind evolution (there is no intelligent designer in the Heavens or on the ground). The “endless forms most beautiful and wonderful” of the living realm were produced gradually, through blind and bad/good luck, without an intelligent designer. This was the essence of Darwin’s controversial challenge to religious doctrine.\textsuperscript{125}

\textsuperscript{124}Waltz 1979.
\textsuperscript{125}For a discussion of the importance of design without a designer in Darwinism, see Dennett 1996.
Similarly, IR theory conceptualizes states as “passive receptors of an international structure ... such that they have no choice but to adapt and conform to its constraining logic.”\textsuperscript{126} The international system is the primary selection environment for the state. Waltz, for instance, assigns causal primacy of the international environment by making minimal assumptions about states’ capacity to learn systemic lessons: states can “do any fool thing,” he assumes, but “they are likely to be rewarded for behavior that is responsive to structural pressures and punished for behavior that is not.”\textsuperscript{127} Rational learning is not a foundational assumption about the nature of evolutionary units, but an outcome of selection processes. “The acid test of most realist theories is not whether states conform to realpolitik principles,” Peter Feaver notes, “but whether those states that do not conform are worse off than those that do.”\textsuperscript{128} As Waltz puts it:

“Competitive systems are regulated, so to speak, by the ‘rationality’ of the more successful competitors. What does rationality mean? It means only that some do better than others – whether through intelligence, skill, hard work, or dumb luck... The orderliness is in the outcome and not necessarily in the inputs. Those who survive share certain characteristics. Those who go bankrupt lack them. Competition spurs the actors to accommodate their ways to the socially most acceptable and successful practices. Socialization and competition are two aspects of a process by which the variety of behaviors and of outcomes is reduced. (...) Where selection according to consequences rules, patterns emerge and endure without anyone arranging the parts to form patterns or striving to maintain them. The acts and the relations of parties may be regulated through the accommodations they mutually make. Order

\textsuperscript{126} Hobson 2000: 9.
\textsuperscript{127} Waltz 1997: 915.
\textsuperscript{128} Feaver 2001: 166.
may prevail without an orderer; adjustments may be made without
an adjuster; tasks may be allocated without an allocator.”\textsuperscript{129}

The analogy with microeconomics is instructive. The international system has
often been compared to the conditions that are assumed to operate under
oligopolistic competition, whose dynamics are, in turn, often compared to those
of Darwinian environments. Under oligopolistic competition, firms are forced by
the competitive logic of the system to be price takers, not price setters as they can
be in the rare cases where they succeed in forming cartel arrangements. “Where
selection according to consequences rules, patterns emerge and endure without
anyone arranging the parts to form patterns or striving to maintain them.”\textsuperscript{130} In
IR, international order, balance or insecurity are said to occur without an
orderer, balancer, or aggressor. Waltz and Jervis have thus shown how security
competition dynamics can occur in anarchic system solely composed of status
quo-seeking states preferring cooperation.\textsuperscript{131}

\textit{Darwinism and Realism}

While IR scholars overwhelmingly agree on the anarchic and Darwinian
character of the international system, there is disagreement about the
consequences of anarchy. Liberal and Constructivist IR perspectives on the
international system environment believe that this environment, although
fundamentally biased towards competition and conflict, can to some extent be
modified by states. Indeed, these perspectives have pointed out and sought to

\textsuperscript{129} Waltz 1979: 77. Emphasis added.
\textsuperscript{130} Ibid: 77.
explain the growing inter-state cooperation, integration and organization in the international system. In an era devoid of inter-state wars and characterized by growing international cooperation, integration, and organization, Realism has lost important ground to its Liberal and Constructivist critics.

One of Realism’s more successful defenses when confronted with these anomalies has been to appeal to the fundamental and enduring character of Darwinian dynamics in the international system, both at the level of human dispositions and the dynamics of the international environment. Darwinism is widely believed to support the Realist claim that egoism, fear and the drive for domination continue to lurk underneath the social construction of peace and cooperation, waiting to be reactivated by the next power shift.

Surprisingly, despite having proverbially thrown ‘everything but the kitchen sink’ at Realism, Liberals and Constructivists have not challenged the Realists’ take on the fundamental structure of the international system and their claim that Darwinian dynamics regulate that level. Liberals, English School scholars and Mainstream Constructivists have largely accepted the claim that at the most fundamental level, once we strip states of their outer layers of attributes and identities, the international system is at its core a Darwinian population and environment. Robert Keohane thus argues for the role of international regimes in making international cooperation possible, but acknowledges that “sovereignty and self-help mean that the principles and rules of international regimes will
necessarily be weaker than in domestic society.” Wendt argues even more explicitly that the fact that states are essentially self-organized entities (state organisms) means that the international system is at its most fundamental level biased towards selfishness. Although international regimes and whole cultures of anarchy can grow and spread in the international ‘environment,’ this environment remains fundamentally Darwinian, and thus, continues to impose competitive selection pressures on these processes. Indeed, it seems as if IR scholars have conceded Darwin to the Realists.

*Should we turn to Lamarck?*

Rather than challenging the Realism’s claim to Darwin, some scholars, most recently Lilach Gilady and Matthew Hoffman, have suggested a return to Lamarck, a predecessor of Darwin whose theory of evolution via the inheritance of acquired characteristics has long been discredited as biologically wrong, but whose progressive view of evolution and emphasis on learning, they claim, may constitute a better metaphor for normative evolution than natural selection.

While Lamarckian ideas are appealing for Liberals and Constructivists, I argue that they should not so readily turn to Lamarck and concede Darwin to the Realists, because taking a Lamarckian turn risks being self-defeating, adds little marginal value, and it is ultimately unnecessary. Leaving Darwin to the Realists and returning to Lamarck plays right into Realism’s traditional hegemonic,

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133 Wendt 1999.
134 Gilady and Hoffman 2013. Also see Wendt 1999.
legitimation strategy, which, as its name suggests, has been to cast itself as being more scientific and having greater insights into political reality. Indeed, while Darwin’s theory of evolution by natural selection is widely seen as “the greatest intellectual revolution experienced by mankind” and as having “single-handedly effected the secularization of science,” Lamarck, on the other hand, is “one of those wonderful footnotes in historical trivia – the person who got evolution wrong,” as Gilady and Hoffman themselves readily admit.136

While Gilady and Hoffman are right to suggest that social scientists “are not bound by biological validity ..., but rather by the leverage that such a framework can provide,” unfortunately the value added of a contemporary turn to Lamarck is likely to be comparatively limited.137 It is precisely the fact that there are many affinities between Lamarckian ideas and modern social theory that reduces the purchase of Lamarckism. Lamarckian ideas, which have already been around for more than 200 years, have already had an early influence on many of the founders of modern social theory, Émile Durkheim, Auguste Comte, Karl Marx and Jean Piaget to only name a few, who recognized the affinities between Lamarck’s progressive vision of evolution and the importance of learning and socialization in social relations.138 Since Lamarckian ideas are already embedded in many of the ideas that are foundational to IR Liberalism and Constructivism, turning to Lamarck risks reinventing the wheel.

137 Ibid: 308.
Finally, and most importantly, conceding Darwin to the Realists and turning to Lamarck is unnecessary: a Darwinian perspective on international relations, I will argue, does not necessarily support Realism’s conflictual view of international politics. In chapter 2, I will critically challenge the claim that Darwinism belongs to a single perspective on IR by demonstrating how some of the most influential recent developments in evolutionary theory, which challenge traditional Darwinism in many respect while remaining Darwinian at their core, are in fact consistent with contemporary international political trends towards a more peaceful, cooperative, integrated, and organized international system, phenomena that are traditionally understood in Liberal and/or Constructivist terms. Because these contemporary developments in evolutionary theory have yet to draw the attention of IR theorists and social scientists in general, unlike older Darwinian and Lamarckian ideas, they promise fresh insights into the transformation of the international system.

Problems with the Darwinian perspective on the international system and globalization

When it comes to the question of international system transformation in the globalization era, two phenomena are in need of explanation: the expansion and entrenchment of the international system in the face of unprecedented transformations and challenges in the international system’s environment since 1945, and the fact that key so-called ‘environmental’ challenges to the
international system are to a significant extent products of the international system’s own activities and therefore, endogenous to the system.

The dominant Darwinian evolutionary perspective on the international system effectively raises the international-system-under-globalization puzzle. Because it assigns causal primacy to environmental selection and treats the environment as exogenous to the system, a traditional evolutionary perspective leads us to expect dramatic changes in the international system’s environment to prompt corresponding changes in the system itself. Indeed, because it assumes that states are structurally trapped in international competition dynamics, the Darwinian perspective expects states to “race to the bottom,” and therefore, to be unable to control environmental parameters and to become products of globalization pressures. The persistence, expansion, and consolidation of the international system under such circumstances are thus puzzling for the dominant Darwinian evolutionary perspective; while it effectively raises the puzzle, the Darwinian perspective cannot provide theory-consistent solutions.

As I will argue in greater detail in chapter 5, an evolutionary perspective that privileges the causal role of the system’s environment and that exogenizes this same environment necessarily offers limited insights when dramatic environmental transformations are not followed by corresponding changes in the system under study. What is more, the explanatory structure of Darwinian evolution makes it backward-looking and unable to offer insights into the future of an evolving system. By exogenizing and privileging the causal role of the
environment, and assuming that the evolving system itself is a passive object of evolution, evolutionary theory can say very little about the transformative potential and likely future transformations of the international system. Finally, for the same reasons, the Darwinian evolutionary perspective on the international system is unable to grasp how the international system is productive of some of the globalization phenomena that appear to challenge it.

**Philosophy and approach of the dissertation**

This dissertation takes an unusual approach by joining two long-standing but very distinct efforts to understand the character of the international system and its historical transformations: Critical IR and Evolutionary IR.\footnote{Ringmar 1996; Bartelson 1998; Walker 1993.} My purpose in exposing the dominance of the anarchy problematic and its underlying Darwinian assumptions is critical. Critical theory, as Robert Cox defines it, seeks “to become clearly aware of the perspective which gives rise to theorising, and its relation to other perspectives” in order “to open up the possibility of choosing a different valid perspective from which the problematic becomes one of creating an alternative world.”\footnote{Cox 1981: 128.} Like Cox, Ashley and Ruggie, I am also interested in problematizing the reproduction of the international system and in highlighting its contingent character.\footnote{Ashley 1984; Ruggie 1983.} I do so by targeting the dominant Darwinian frame through which IR scholars think about the international system and by...
challenging the underlying assumptions that contribute to give it an air of inevitability, in spite of the mounting empirical anomalies I have pointed out earlier. My goal is thus to expose how the concepts and theories we employ to think about states and the international system produce important blind spots that have not only limited our understanding of international politics, but that have also had pernicious performative effects on international political practice. In doing so, I share Critical IR’s interest in exposing the power structures and relations that influence our theoretical perspectives on the international system, such as how the Darwinian ontology of the international system legitimates Realism and the particular kind of attitude towards international relations it justifies, as well as how this perspective precludes us from considering other interpretations for contemporary phenomena.

My approach significantly diverges from previous critical theories of the international system, however, in that I do not draw primarily from the humanities or social theory. Instead, I follow a rather unorthodox approach, and borrow from some of the latest research in biological theory and from contemporary debates in the philosophy of biology. I am obviously not the first to use biological theory to make sense of the international system. After all, my main target is the IR literature that has sought to elucidate international political change through a Darwinian evolutionary perspective inspired by biological theory. However, my approach significantly differs from existing applications of biological theory in that, rather than borrowing from popular textbook

accounts and treating biology as a settled field, I engage the latest contemporary *debates* in biological theory, paying close attention to emerging perspectives that challenge more traditional accounts. I thus use the best and latest biological thinking to unsettle key biological metaphors that IR scholars have, often unknowingly, been taking for granted for decades.

My combination of critical theory and biological theory forms an unusual ‘pincer movement’ that promises to unlock previously foreclosed theoretical possibilities and offer a new structural foundation from which we can ask contemporarily relevant questions about the contemporary status and future transformations of the international system. From a critical perspective, however, this can seem a rather strange move, given that the use biological notions to describe social phenomena are typically seen as the ultimate form of reification of the social.143 Employing biological theory for a critical purpose can seem paradoxical, to say the least, and thus begs justification.

I believe that contemporary biological theory can play a critical role in social theory once we recognize two facts. First, while IR has borrowed from biological theory as if it was monolithic, it is in fact a highly debated field in where almost everything, from the proper level of natural selection to the nature of biological individuality, is the object of ongoing contestations and debates. Treating biological theory as a debated field enables the kind of perspective taking that is at the heart of the critical project. The recent research on symbiotic associations

143 Neumann 2004.
and METIs, which I will use in chapter 2 to critique the dominant Darwinian narrative about the international system, are challenging many widely held biological assumptions that we implicitly make in IR – notably on the nature of biological individuality and on the importance and role of cooperation in evolution. As this dissertation will serve to demonstrate, the belief that biology is substantialist (and thus, that its theories reify the social) and that it privileges a Realist reading of the international system is to a large extent the reflection of the outdated state of our understanding of biological theory. Treating biological theory as a contested and debated field enables us to think about international system transformation critically and provides us with new concepts, mechanisms and theories that enrich our capacity to describe international political phenomena.

Second, most modern biological theories are not “substantialist,” as Iver Neumann’s critique of Wendt’s “State as Person” argument suggests. In fact, modern biological theory is one of the sciences that is the most consistent with processual/relational philosophy. Evolution, autopoiesis, and development, which I use to describe the international system in the dissertation, are all processes that biological theory understands as ontologically prior to the entities that they produce.

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145 On the distinction between substantialist and processual/relational ontologies, see Jackson and Nexon 1999.
Substantialism and processualism

In order to create space for critical theory and the use of biological metaphors, I adopt a processual ontology of the international system.\textsuperscript{146} The evolutionary, physiological and developmental biological theories that I apply to the case of the international system are all fundamentally processual in character, and a critical theory of international system transformation only becomes possible if we adopt a permissive ontology that enables the theorization of a wider range of possible paths of transformation of the existing order. However, while all ontological choices necessarily constrain the range of questions we can ask, not all ontological choices are equally constraining.\textsuperscript{147} Processual ontologies are more permissive, from a critical standpoint, because they assume that change is the default condition in the world and seek to account for the configurations of processes that produce stable entities in the face of other destabilizing processes. In a processual ontology of the international system, the state and the state system are always in the process of ‘becoming’ rather than ‘being.’\textsuperscript{148} Processualism is thus consistent with a critical theory that “does not take institutions and social and power relations for granted but calls them into question by concerning itself with their origins and how and whether they might be in the process of changing.”\textsuperscript{149}

\textsuperscript{147} Wendt 1999: ch.2.
\textsuperscript{148} Rescher 1996.
\textsuperscript{149} Cox 1981: 129.
A processual ontology can be contrasted with the traditional ontology of the international system that I have described above, which takes the stable existence of its fundamental units for granted. As my earlier discussion makes clear, the anarchy problematic clearly rests on substantialist assumptions: the focus is on the actions and interactions of pre-existing states whose fundamental characteristics stand outside of process. The account of change that this perspective permits is limited, as Patrick Jackson and Daniel Nexon point out, by the distinction it must make between the ‘primary’ and ‘secondary characteristics’ of an entity in order to account for change in this entity. Primary characteristics are the invariant characteristics that make an entity what it is (Wendt’s corporate identity, the ‘essential state’). Secondary characteristics can vary among different tokens of the same entity (Wendt’s role identities). In the anarchy problematic, these secondary characteristics are the variables (capabilities, interests, role identities) that vary as the result of interaction processes. Primary characteristics, on the other hand, are not modified by these interactions; a state remains a state, even as it acquires or loses capabilities, as its interests shift from revisionist to status quo, or as it moves from thinking of itself as an enemy to a rival to a friend. By assuming primary characteristics that stand outside of process, substantialist accounts have great difficulty accounting for fundamental changes in the entity itself.

150 See Jackson and Nexon 1999: 296. Their discussion is based on Rescher 1996.
151 Wendt 1999: ch.5.
152 Ibid.
Because a processual perspective shifts the explanatory task from explaining how
the secondary characteristics of ontologically fixed entities change to explaining
how configurations of processes produce relatively stable entities, the choice of a
processual ontology is consistent with my critical goal. Indeed, it enables us to
think about states and the state system as contingent on their successful
(re)production. In other words, a processual perspective highlights all the ‘work’
that it takes to keep these contested entities in existence.

In Neorealism, for instance, the only possible path to a fundamental
transformation of the international system is the conquest of the system by a
single actor as a result of the failure of the balance-of-power mechanism. What
about the possibility of social revolution, as a result of the delegitimation of the
state and the state system? Can crises of legitimacy be addressed by theories that
are built on an ‘essential state’? If the state has a material existence prior to
process, what role can legitimacy play?

Questions about state legitimacy drop out to a large extent from the picture that
the anarchy problematic paints. Without legitimacy, however, states and their
‘capabilities’ quickly disintegrate. As every dictator should know, no state can last
for very long on force and coercion alone, if only because force and coercion
necessitate the work of real people, soldiers and policemen. If every coercer has
to be coerced, then where does the coercion chain begin? Regimes that fear for
their survival may go to great lengths to maintain the support of their ‘coercers of

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153 See Hui 2005; also see Cederman and Girardin 2010 for an agent-based simulation of this path
to systems change.
last resort,’ but even praetorian guards can rebel if their support does not ultimately rest on some degree of legitimacy.

Theories couched in terms of ontologically primitive states cannot capture the importance of legitimacy for the state. Yet, challenges to its legitimacy are precisely the kind of ‘threats’ the state system currently experiences. Terrorists detonating a nuclear weapon in New York City, for instance, would not threaten the United States and other states in the international system with the prospect of conquest. Rather, such an event actually threatens the United States and other states at the level of their legitimating discourse, more specifically their claim to a monopoly on violence and their capacity to protect their population. Similarly, states’ repeated failure to cooperate over the issue of global warming will undoubtedly present a severe challenge to the legitimacy of the state systemic form in the event globally rising temperatures produce important cataclysms. The prospect of de-legitimation, not the conquest of the international system by a coalition of revisionist ‘wolves’ and ‘jackals,’ represents the most serious kind of threat that the system faces today.154

Viewing states and the international system as the products of processes of self-production of metapolitical authority, as I will propose in chapter 3, restores the importance of legitimacy and enables us to consider legitimacy crisis, delegitimation and revolution as potential avenues for change. This is not to say that delegitimation is easy to accomplish. As I will argue in greater detail later,

being self-producing systems, the state and the international system are organized so as to reproduce their authority and maintain their autonomy. Indeed, even though it is rooted in a processual ontology, the story I tell in this dissertation is about their remarkable autonomy, ability to persist, and the conservative nature of their transformation.

**Empirical strategy**

While my goal in this dissertation is primarily critical, this dissertation also has a significant empirical component. In fact, my critical argument begins with and builds on an empirical story, albeit an unconventional one. The central claim on which the dissertation builds takes the form of a working hypothesis, whose empirical plausibility I evaluate in chapter 2: the international system appears to be in the midst of an important structural transformation that evolutionary biologists call a Major Evolutionary Transition to Individuality (METI). In a nutshell, METIs are critical junctures in evolutionary history during which previously independent and competing individuals manage to suppress conflict and foster such a high degree of cooperation among them that they effectively ‘de-Darwinize’ their relations to form a new, higher-level, collective individual (or agent).

I argue that major trends in the international system since 1945 are consistent with the hypothesis that the international system is experiencing a METI. The decline of inter-state war, dramatic growth of international cooperation, organization and integration, growing benefits of statehood, and growing
importance of extra-systemic threats and risks relative to state-based ones are all consistent with an METI. In the language of METI theory, these trends suggest that inter-state relations are ‘de-Darwinizing,’ which does not mean that Darwinian selection dynamics are completely disappearing, but rather that they are increasingly being displaced to a higher level.\textsuperscript{155} While, at the level of inter-state relations, multilateral cooperation is becoming the norm, Darwinian selection dynamics are shifting to the level of the interactions between the international system as a collective agent and its own environment. The international system can thus increasingly be understood through the metaphor of ‘superorganisms’ like social insect colonies. Like the social insects living in a colony, states, buffered in the increasingly solidary, cooperative, predictable and mutually supportive ‘internal’ environment that the contemporary international ‘superorganism’ provides, increasingly work together to identify, manage and combat threats lying outside the system’s boundaries, such as terrorism, poverty, diseases, and global warming.

Because this is a first pass at a big, important question, I cannot give definitive answers to all the empirical questions that the METI hypothesis raises. While I will show that several important empirical observations in the contemporary international system are consistent with the occurrence of a METI, I cannot make a definitive argument about the historical location and causes of this transition. What is more, note that I am not arguing that these international political trends

\textsuperscript{155} The term ‘de-Darwinizing’ is from Godfrey-Smith 2009.
are caused by the METI or that they cause the METI: what I am arguing is that these trends, together, are a METI. My argument is a constitutive argument.\textsuperscript{156}

In addition to the plausibility test of the METI hypothesis in Part A (chapter 2), my empirical claim should be evaluated on the basis of the plausibility and potential fruitfulness of the physiological (Part B, chapters 3 and 4) and developmental (Part C, chapters 5 and 6) descriptions whose formulation it makes possible. Indeed, the plausibility of any chapter of this dissertation should be assessed in light of the others, since each chapter represents one aspect of the overall picture of international system transformation.

Beyond its empirical claims, I want to stress the path breaking role this dissertation plays. This dissertation can be regarded as a playing a “forward-looking” role vis-à-vis IR scientific practice, “by describing and exploring whole new kinds of theoretical structure, at a stage when these theoretical structures cannot yet be brought into much contact with empirical methods.”\textsuperscript{157} The rigorous empirical testing of a hypothesis is meaningless until we have formulated the hypothesis and established that it is both plausible and potentially fruitful to our understanding of international politics, and thus, worth testing in the first place.

\textsuperscript{156} Wendt 1998.
\textsuperscript{157} Godfrey-Smith 2001: 284.
Problematizing redescription

The most important contribution that this dissertation makes to IR is to offer a problematizing redescription of the international system. Problematizing redescriptions, which Ian Shapiro defines as a “two-step venture that starts when one shows that the accepted way of characterizing a piece of political reality fails to capture an important feature of what stands in need of explanation or justification” and that consists in offering “a recharacterization that speaks to the inadequacies in the prior account.” Problematizing redescription plays an important role in social scientific inquiry because of the fact that all observation is theory-laden. As I will show in this dissertation, problematizing individuality makes it possible to fundamentally rethink the character of the international system. Beyond their empirical plausibility, my arguments should thus be judged for their heuristic and critical value.

The METI hypothesis has a number of important implications for our thinking about the international system, international political dynamics and the future of global governance. First, since the anarchic international system has constituted the last obstacle in the movement towards a global society described by sociobiologists such as Edward O. Wilson, the de-Darwinization of the international system should enable further global social and economic integration. Second, we should thus expect the international system to exercise more agency in the face of exogenous processes, such as globalization, than what

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159 Wilson 1975.
traditional Darwinian perspectives have led us to anticipate, and as a result, to be particularly resilient and difficult to steer. As I will explain later, with each successive METI the new higher-level entity has had a tendency to display greater control over its environment. Third, we will need new frameworks to understand contemporary international system dynamics. Just as we currently think from the perspective of the individual state and its international environment (i.e. in terms of domestic versus international politics) we will need theories that makes sense of the interactions and processes of boundary production between the international system superorganism and its own environment. The application of the physiological perspective to the case of the international system in Part B, for example, it will enable me to expand our understanding of the international system’s structure, to include an important vertical dimension, namely the boundary between the international system and its own environment. It will enable me to recast international anarchy as the apex of a more fundamentally stratified structure based on the production of status distinctions between states and non-states actors, which will, in turn, enable me to rethink the state’s corporate interests, to include “class” interests about the position of the international system in its environment.

Fourth, because any METI is a process that is never fully completed, we will need to think about how the emerging international system individual adapts conservatively to challenges within and without. And finally, if the international system is indeed in the process of becoming an individual, we will also need new theoretical perspectives on its contemporary and future transformations. More
specifically, we will need to think about the international system’s ‘development’ (change in single individuals over the course of their lifecycle) to complement our understanding of its ‘evolution’ (change in populations through turnover in their individual members).

The developmental perspective that I propose in Part C is the first elaboration of development as a distinct perspective on change in an IR context. For a number of reasons, unlike evolutionary ideas, the insights of developmental biology have been virtually ignored in IR.160 While the word ‘development’ is used quite frequently in IR texts, it has not been explicitly theorized as a general perspective on system change in IR. Typically, it is used as a synonym for change and even, sometimes, evolution.161 In modern biology, however, evolution and development are distinct perspectives, with very different units of analysis, concepts, mechanisms, and theories.

The developmental perspective that I propose has much to offer to IR, especially on the issue of international system change where it offers theoretically-consistent solutions to the problems that plague existing evolutionary perspective. Because it endogenizes the relationship between the developing system and its environment, which mutually construct each other in the course of developmental cycles, thinking developmentally about international system transformation enables me to account for the growing endogeneity observed

160 See discussion in chapter 5.
161 One exception is Alex Wendt’s world state argument which briefly discusses development, in Wendt 2003.
between the international system and its environment, an important piece of the globalization puzzle. Also, while the fact that the international system has thrived in the face of environmental challenges is anomalous from a traditional evolutionary perspective, cases of conservative adaptation fall squarely within the explanatory domain of a developmental perspective. Finally, developmental concepts like structural determinism and norms of reaction capture how a system’s organization and structure constrain the range of normal transformations a system is capable of, thus enabling us to formulate some insights into the future transformation of a system.

Outline of the chapters

This dissertation does not follow the typical structure of IR dissertations, where one or two chapters are dedicated to theoretical discussion and the remaining chapters address various empirical tests and cases. Instead, the three major parts of this dissertation – titled “Evolution,” “Organization and structure,” and “Development” – are respectively structured around the three complementary biological theoretical perspectives – evolutionary, physiological and developmental – through which I challenge the dominant Darwinian perspective. Each perspective adds a different piece of the overall puzzle: modern evolution and METI theory (Part A, chapter 2) tell us how the contemporary international system was put on tracks towards individuality; physiology and the theory of self-producing systems (Part B, chapters 3 and 4), how the international system
maintains itself on those tracks; and development and developmental systems theory (Part C, chapters 5 and 6), where those tracks can lead the international system in the future.

What is the international system? How does it change? Part A – Evolution – gives an answer to the first question from a modern evolutionary perspective. In chapter 2, I argue that recent international political trends suggest that the international system is undergoing a METI and becoming an individual. In Part B – Organization and structure – I ask the follow up question: what kind of individual is the international system becoming? There I go beyond traditional/commonsensical approaches and evolutionary approaches to individuality and take a physiological, structural approach. In chapter 3, I describe the logic of self-producing systems. In chapter 4, I investigate the organizing principles and the de-Darwinization mechanisms that sustain the new international system individual in the face of Darwinian pressures without and within that threaten to undermine cooperation, integration and organization. In Part C – Development – I answer the second question: if the international system is an individual, it means that its contemporary and future transformations will be better understood in developmental terms. An evolutionary perspective can show how individuals emerge, but since it is about change in populations of individuals it tells us comparatively little about how any given individual, once constituted, will change over time. This is the domain of development, which is the study of changes in single individuals, in close and mutual interaction with their environment, over the course of their lifecycle. In chapter 5, I discuss the
structure of evolutionary theory and show how it cannot help us grasp the particular blend of transformations and continuities in the contemporary international system. In chapter 6, I introduce development as an alternative perspective on change that is not only the logical extension of the arguments I make in chapters 2 to 4, but that also promises to elucidate the very problems traditional evolutionary frameworks struggle with.
Part A

Evolution
The Major Evolutionary Transition to Individuality in the international system

This chapter presents the working hypothesis on which the rest of this dissertation will develop. I will argue that the international system appears to be in the midst of an important structural transformation that modern evolutionary biologists call a Major Evolutionary Transition to Individuality (METI). METIs are critical junctures in the evolutionary history of a population where its constituent individuals, which were formerly engaged in Darwinian competition, succeed in suppressing conflict among them and in achieving such a high degree of cooperation that they effectively become a new, collective individual that becomes itself the new object of Darwinian selection pressures. The upshot of this argument is that the international system, which IR scholars traditionally understand as a Darwinian population and environment, is increasingly becoming a Darwinian individual in its own right. In other words, the structure is becoming an agent.

The chapter proceeds as follows. First, I discuss the question of individuality, its importance, how we typically think about it in IR, and how biologists and philosophers of biology are in the process of revolutionizing how we think about
individuals. In the second section, I introduce METIs, how they challenge traditional Darwinism, their stages, and their consequences. In the third, I formulate the working hypothesis that the international system is in the midst of a METI and deduce observable implications of this hypothesis. I then argue for the plausibility of this working hypothesis by describing important trends in the international system that are consistent with a METI: the decline of inter-state violence, the increase in cooperation, integration, and organization, and evidence that natural selection pressures are increasingly being displaced from individual states to the level of the international system’s interactions with its own environment. I conclude with a discussion of some of the most important implications of the argument I make in this chapter.

The international system and the problem of individuality

Before I can argue that the international system is becoming an individual (or agent), I have to dispel the widespread and deeply held belief that it cannot be one. The Darwinian perspective on the international system – the international system is a population of states that simultaneously constitutes these states’ primary security environment – enjoys prima facie plausibility in large part because it is consistent with taken-for-granted assumptions about the nature of real individuality in international politics. These assumptions are influenced by the experiential and traditional philosophical understanding of individuals as
discrete, indivisible, and spatiotemporally continuous beings.\textsuperscript{162} This understanding of individuality is, itself, embodied in the belief that singular organisms, which we typically assume human beings are, are the paradigmatic biological individuals. In most accounts of international relations, individual human beings thus generally constitute ‘real individuals,’ state individuals are ‘useful fictions,’ and the international system is merely an environment that is the contingent by-product of the interactions of these more or less real individuals. In a nutshell, as we move away from individual human beings and towards social aggregates, we believe individuality is less and less real. Of course we routinely treat the state as a unitary actor, but as Wendt points out, when we bother to problematize its actorhood, we typically defend the assumption as a methodological convenience.\textsuperscript{163} The international system, on the other hand, is generally conceptualized as nothing more than an externality and (almost) never as an individual, real or usefully fictitious, in its own right.\textsuperscript{164} James Mayall echoes the general sentiment when he writes that the international system “has no concrete physical existence” since “its boundaries cannot be demarcated even in principle – what on earth could lie beyond the boundaries of the international system – and one certainly cannot go there.\textsuperscript{165}

\textsuperscript{162} Hull 1978.
\textsuperscript{163} For the most in-depth discussion of state personhood, see Wendt 2004.
\textsuperscript{164} One notable exception is Wendt’s (2003) world state argument.
\textsuperscript{165} Mayall 1990: 7. Emphasis added.
In IR, the question of individuality – what is an individual?\textsuperscript{166} – appears to have been settled without really ever being asked. In some areas of biology and philosophy, however, the question of individuality has become one of the most hotly debated problems and has for all means and purposes replaced more traditional debates about the status of organisms.\textsuperscript{167} In these disciplines, the concept of “individual” has risen to become an “essentially contested”\textsuperscript{168} concept.\textsuperscript{169} In IR, however, while we are comfortable with the methodological individualism vs. holism debate,\textsuperscript{170} the problem of individuality itself is not a familiar question. Indeed, in IR it is somewhat buried under the intimately related issues of agency and identity, which have received the bulk of the attention. In this dissertation, I pose the question of individuality about the international system – is the international system an individual? – using biological theory debates to inform a first consideration in an IR context.

What is an individual? Much of our intuition about the nature of real individuality originates in folk biology. For a long time, commonsense about individuality was for the most part supported by biological theory, which was itself founded on the concept of organism. We have tended to assume that individuals are organisms, but not any organisms; only familiar vertebrates like humans, horses, and cats are individuals. These assumptions about individuality have been so widespread and intuitive that in IR, the nature of individuality has

\textsuperscript{166} Clark 2010.
\textsuperscript{167} Pradeu 2010: 256.
\textsuperscript{168} Gallie 1955.
\textsuperscript{170} Wendt 1987, 1999.
rarely been questioned. In fact, it has already been figured out without being formulated as a question. The question individuality, however, should matter to IR scholars, for important reasons.

First, the question of individuality has direct import for the question of identity, because the question of individuality precedes it ontologically. How we treat the question of identity depends on how we previously answer the question of individuality, in the sense that only individuals can be the bearers of an identity in the fullest sense. In IR, then, a major reason why so much attention has been devoted to the identity of political actors from individual human actors up to the state, but not the identity of the international system itself, resides in the discipline’s tacit assumptions about individuality. In IR, we assume that human beings are real individuals and that states can be usefully seen as individuals (because as I will discuss later they are implicitly assumed to be like organisms), but the international system itself is definitely not an individual.171

Second, the problem of individuality parallels the problem of identity. The terms of the two problems (indivisibility, distinctness, continuity) are similar.172 In other words, what social theorists call the problem of identity, biological theorists call the problem of individuality. How is the Self/individual distinguished from the Other/environment (and how do the former develop in interaction with the latter)? How is identity/individuality maintained across changing contexts/environments over time?

171 One notable exception is Wendt 2003.  
172 See Bartelson 1998.
The question of identity, as constructivists have shown, underpins the attribution of interests and beliefs, the engine of most IR theories. The concept of identity has anchored much IR scholarship in the last 30 years and constitutes the cornerstone of the debates between rationalists and constructivists. Since individuality is the necessary foundation of identity, the recent revolution in the way biologists think about individuality should be of great interest to many IR scholars, and not only to scholars specializing on questions of identity.

Third, the question of individuality is intimately tied to the agent-structure problem and to the related, more practical and operational matter of determining what should be the proper units and levels of analysis (or images) of international phenomena.\textsuperscript{173} Individuality enables agency because the continuous existence of a purposeful entity over time is a prerequisite for what we typically understand as agency.\textsuperscript{174}

Finally, and most importantly, addressing the problem of individuality is important in IR because we already make (admittedly tacit) assumptions about the nature of individuality and these assumptions have been foundational to the way we think about human beings, the state, the international system, and international political dynamics. In the ontology of international politics, only individual human beings are seen as real individuals. Of course many IR scholars working from a systemic perspective assume that states act as if they are

\textsuperscript{173} On the agent-structure problem, see Wendt 1987 and Dessler 1989; on the levels-of-analysis problem, see Waltz 1959 and Singer 1961.
\textsuperscript{174} For a discussion of the terms of agency in IR see Mitzen 2006, 2013.
individuals, but they generally defend this move as mere convenience. As Eric Ringmar puts it:

“Although the state can be described in many different ways, when viewed from the outside – as one entity among others in world politics – it is almost invariably talked about in anthropomorphic terms. It is seen as an ‘actor’ or a ‘person’; it is a ‘someone’ or a ‘subject’ to whom intentions, memories, rights and obligations are attached. Yet it is far from clear in what sense states can be thought of in analogy with human beings. This fact is also often acknowledged by International Relations scholars who invoke the anthropomorphic vocabulary only after making a standard apology. The comparison between the state and a person is a ‘mere metaphor’, we are told, which ‘should not be taken literally’ (Buzan et al. 1993: 112; Gilpin 1986: 318-319). Having prefaced their analyses in this fashion, the same scholars then go on to rely on the same vocabulary as one of the most fundamental – and in practice irreplaceable – assumptions of their research.”

Indeed, when comes the time to investigate the particular actions of these state ‘individuals’ (the domain of theories of foreign policy), IR scholars typically move away from the assumption of state individuality and favor more pluralistic approaches, in which close attention is paid to the bureaucratic, organizational, institutional, economic/sectoral structure of the state, its foreign policy system, and the various human individuals at different levels (and their beliefs and interests) that embody the state. In the end, we all believe that “that which we call ‘the state’ is only a loose set of ordered preferences, an enormous aggregation of individual preference schedules which always be contingent upon day-to-day politicking.” While this has been an object of debate for a long time, today,

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175 Ringmar 1996: 443.
176 Ibid: 442.
most Liberal and Realist scholars, and most of those that fall in between, lean somewhere closer to the pluralist view of the state. Indeed, if there was a time when ‘Classical’ Realists espoused a certain organicism about the state, modern Realists, since Waltz, have instead taken state individuality to be only a useful assumption in the building of a systemic theory of international politics. The extent to which even the Realists are not too serious about state individuality has been made particularly clear in the controversy over the status of realist research on foreign policy (Neoclassical Realism), which unpacks the state and the foreign policy process. Jeffrey Legro and Andrew Moravcsik critiqued so-called ‘Neoclassical’ Realist explanations\(^\text{177}\) for sharing many assumptions with Analytical Liberalism, an approach that privileges the ontologically prior role and agency of domestic actors in the formulation and conduct of foreign policy.\(^\text{178}\) This lack of distinctiveness from its main competitor, they argued, made the Realist research program less distinctive and ultimately, degenerative.\(^\text{179}\)

The international system, however, not the individual state, is the ‘entity’ that interests me in this dissertation, and there, we find even greater consensus among IR scholars: the international system is almost never seen as an individual in its own right. The international system is an environment, an anarchy and/or a society; it is a structure, not an agent in any shape or form. Recently many have argued that the international system has important hierarchical elements, but none of these arguments go as far as suggesting that the international system is

\(^{177}\) Rose 1998; Ripsman, Lobell and Taliaferro 2009.  
\(^{178}\) Legro and Moravcsik 1999; for the Realists’ response, see Feaver et al. 2000.  
\(^{179}\) Also see Vasquez 1997.
an individual or constitutes an agent. States contract into hierarchical arrangements, but at a more fundamental ontological level, they form an anarchy. In the rare occasions that the international system is reflected upon as an agent, it is in the context of the possibility of a ‘world state,’ which shows the limits on our ability to think about individuality or agency beyond the state.\textsuperscript{180}

\textit{New biological perspectives on individuality}

In this chapter I will present evolutionary arguments suggesting that the international system is in the midst of a transition to individuality. Arguing that the international system is becoming an individual amounts to saying that \textit{the structure is becoming an agent}. Because this claim appears wildly inconsistent with what we generally understand by ‘individual’ and ‘agent,’ my goal in this section is to convey the wild variety of forms individuality can take at the biological level: from a biological standpoint, there are no a priori reasons to reject the METI hypothesis. Because IR assumptions about the character of real individuality are rooted in biological assumptions, what biologists are saying matters.

Our model of individuality in IR is the human organism, a view that is supported by a number of traditional, commonsensical and until recently biological assumptions about the nature of individuals, notably their discreteness, indivisibility, (genetic) homogeneity and spatiotemporal continuity.\textsuperscript{181} Such an understanding of individuality admittedly makes it difficult to conceive of the

\textsuperscript{180} See Wendt 2003.
\textsuperscript{181} Hull 1978.
international system as an individual, since the farther we move away from individual human beings, the more implausible individuality becomes. In IR theory, individual human beings are thus generally assumed to be the ‘real’ individuals, state individuals are at most ‘useful fictions,’ and the international system itself is merely the contingent by-product of the interactions of these individuals. The international system is generally conceptualized as an environment; as nothing more than an externality and (almost) never as an individual, real or fictitious, in its own right. The exception appears to be the state, which we often anthropomorphize but whose individuality, in the rare cases it is problematized, we generally treat as mere methodological convenience.\textsuperscript{182} However, it is one thing to assume that states, with their deeply institutionalized governmental structures and well-defined and defended territorial boundaries, are \textit{like} individuals, but to speak of the anarchic international system itself as an individual seems to stretch the concept beyond its limits.

For a long time, biological theory reinforced the traditional/commonsensical view outlined above. Indeed, before the modern synthesis with genetics, Darwinism was decidedly organism-centered.\textsuperscript{183} The organism,

\begin{quote}
“this familiar skin-bound entity was taken by Darwin to be what natural selection ‘sees’ when it acts on a population. The biological individual (as organism) is the entity that population biologists
\end{quote}

\textsuperscript{182} Wendt 2004.
\textsuperscript{183} Bouchard and Huneman 2013, 1.
count. It is everyday deaths and births of such individuals that sum over large numbers to constitute the evolutionary process itself.\textsuperscript{184}

This ‘received view’ was first challenged by the modern, neo-Darwinian synthesis, which marked a decisive reductionist movement towards the gene and away from the organism as the fundamental unit of evolution. The reductionist view was popularized by Richard Dawkins’ ‘selfish-gene’ ontology, which proposed that organisms were not actually the real individuals of evolution, but merely ‘survival machines’ created by genes for their own selfish purposes.\textsuperscript{185} The shift to the gene, however, did not yet constitute a radical break with traditional intuitions about individuality; after all, reductionism only brings us closer to the indivisibility ideal implicit in our understanding of individuality.

The challenge from the more recent symbiotic revolution, however, has a genuinely radical character. The emerging paradigm of individuality in 21\textsuperscript{st} century biology is the symbiotic superorganism. Entities that were once thought to constitute paradigmatic cases of individuals are turning out to be heterogeneous groups, and seemingly clear cut cases of disaggregated collectives, individuals.\textsuperscript{186} The human organism, our traditional model of individuality, has been revealed to be a walking, symbiotic superorganism.\textsuperscript{187} Indeed, despite our intense feeling that we constitute a unitary Self, we are in fact not unitary at all. ‘Our’ existence actually depends on cooperative association with various species

\textsuperscript{184} Clarke 2010: 313.
\textsuperscript{186} Bouchard and Huneman 2013.
\textsuperscript{187} Wilson and Sober 1989 define a superorganism as a collection of organisms exhibiting the functional organization of a single organism.
of bacteria that outnumber genetically human cells ten to one. Wiping out these ‘friendly’ bacteria, for instance when a C. Difficile infection spreads after the prolonged use of anti-biotics, puts us at great risk of death. “We are actually complex communities that include follicle mites, skin and gut bacterial symbionts, and at a more basic level mitochondria.” These bacteria are not mere passengers of the human organism: for many ‘human’ behaviors like food and drug addictions, they are actually the drivers at the wheel. As the great scientist Lewis Thomas puts it, rather poetically, “the whole dear notion of one’s own Self – marvelous, old free-willed, free-enterprising, autonomous, independent, isolated island of a Self – is a myth.” The symbiotic revolution is hitting the scientific mainstream. The astonishing findings of the Human Microbiome Project (HMP), a collective effort to study the human symbiotic superorganism, for instance, have been published in some of the most influential scientific journals, such as Nature and Science, and featured in the popular media. As a group of prominent biologists put it rather bluntly: “For animals, as well as plants, there have never been individuals…. We are all lichens.”

Meanwhile, from the opposite direction, and closer to the case of the international system, biologists are discovering that apparently obvious cases of populations, and even ecosystems, actually constitute genuine biological

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188 Human Microbiome Project 2012.
189 Goodnight 2013, 37.
190 Alcock, Maley and Altipis 2014.
193 Gilbert et al. 2012, 336. Here ‘individual’ is meant in the traditional, commonsensical sense described above. Most lichens are the product of the symbiotic association of algae, bacteria and fungi.
individuals. One astonishing example is a clonal aspen grove named *Pando* (the Latin for ‘I spread’), which constitutes the largest individual organism on earth, weighing over six million tons and spanning an area nearly 40 hectares, with a single root system that is approximately 80,000 years old.\(^{194}\) Pando is a case where our intuitions, confirmed by common experience and informed by deeply rooted philosophical assumptions about the nature of individuality, misguide us. This is not only a case of proverbially missing the forest *for* the trees, but an instance where we should actually think about the forest *as* a tree. The emerging consensus among biologists is that cases that blur the contours of individuality, like the human superorganism and Pando the forest that is actually a tree, are not the exception but actually represent the norm among the living.\(^{195}\)

Have we been missing the (international system) forest for the (state) trees? Could we similarly think about the international system, not as a population of states but *as a state*? The emerging biological perspectives responsible for generating these new insights into the variety of individuality are thoroughly challenging traditional perspectives on the ontology of life and, I argue, make it possible to entertain these kinds of ideas. Indeed, privileging human individuality (unitary organism + consciousness) over other forms of individuality makes little sense if human beings are themselves heterogeneous, symbiotic associations. Similarly, the collective and segmented character of the international system should not prevent us, a priori, from considering its emerging individuality.

\(^{194}\) DeWoody et al. 2008.  
\(^{195}\) Gilbert et al. 2012.
The international system as a spatiotemporal individual

How can the international system, which as Mayall argues “has no concrete physical existence (and whose) boundaries cannot be demarcated even in principle,” be an individual in any meaningful way? In a sense, Mayall is exaggerating. It is actually not very difficult to argue that the international system is an individual in the spatiotemporal sense of being “unique, not only genetically speaking but also as a result of (its) particular history of interactions.” The international system is a spatiotemporally distinct individual in the sense that it has identifiable geohistorical origins and rests on a distinct set of norms that are themselves the product of a traceable historical process. While a majority of scholars locate its spatial origins in Europe, there is less agreement about the temporal origins of the system. The most commonly agreed upon date for the beginning of the state system is the Treaty of Westphalia (1648), which ended the Thirty Years’ War (1618-1648), though this is the subject of much debate. Martin Wight locates its beginnings in the Councils of the 15th century, Adam Watson in Westphalia (1648), Andreas Osiander in Utrecht (1713), and Harry Hinsley as recently as the Concert of Europe of the 1820s. From these origins in Europe, the interaction of the European ‘international society’ with its outside, from the polities of Islam and East Asia, to those of Africa and the Americas, as it grew to become global in scope, has been well-documented, notably by the English

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School. In other words, because of its unique spatiotemporal location and history of interactions with its environment, the modern state system can be seen as distinct from other state systems in history, such as the Greek city-state system and the East Asian state system.

The fact that the international system can be described as an individual from a spatiotemporal perspective on individuality is a good sign, but even if we admit that the international system is an individual in this sense, it still pales in this respect in comparison with the individual state. Indeed, this understanding of individuality falls short of the kind of individuality we have in mind when we think of agency.

*Theoretical perspectives on individuality*

Biologists have been able to revise their understanding of the individuality of human beings, clonal aspen groves, and termite colonies, for the simple reason that they have let their best theories challenge commonsensical views on individuals. Progressive scientific theories produce ontologies that do not necessarily correspond with the world as we experience it. Heliocentrism continues to run against the grain of our common experience, which incorrectly suggests to us that it is the sun that is actually moving above our heads, and indeed, to this day, Ptolemaic astronomy remains closer to how we experience the skies than the Copernican worldview (which explains why it remains useful in

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navigation). Yet, however useful, Ptolemaic astronomy is wrong. Good scientific theories should enable us to “see” beyond the limits of our perceptual horizon.

There are three main modern theoretical perspectives on individuality in biological theory: evolution, physiology, and development. Evolutionary perspectives on individuality apply the triad of variation, selection and inheritance to elucidate change in populations of individuals via turnover in their membership. Physiological perspectives on individuality turn to the organization of individuals and how this organization constitutes and reproduces the individual’s identity over time, even as it experiences sometimes complete turnover in its constituent materials and/or as it changes environments. Finally, developmental perspectives on individuality highlight the dynamic process through which an individual and its environment transform one another over the course of the individual’s lifecycle. From a commonsensical and experiential perspective, cases like the human symbiotic superorganism and Pando, the forest that is really a tree, are deeply puzzling notions; but from modern evolutionary, physiological and developmental perspectives, not so much. In this dissertation, I use the concepts and theories of each to describe the evolution, organization, and development of the emerging international system individual.

*Evolutionary individuality*

In this chapter, I begin my problematizing redescription of the international system with evolutionary theory. The evolutionary argument I will develop here plays a crucial role for the rest of the dissertation because it provides the main
motivation for the complementary physiological perspective of Part B and the developmental perspective of Part C. Evolution is a good starting point, if only because it is the most important and successful biological theory. As Theodosius Dobzhansky famously put it, “nothing in biology makes sense except in the light of evolution.” It is thus unsurprising that evolutionary theory has been in the last few decades the most widely used approach to individuality in biological theory.

The theoretical device that enables us to discern individuals in the evolutionary perspective is natural selection. Evolutionary individuals are “units of selection;” they are the entities on which natural selection operates. In other words, in order to constitute an evolutionary individual, the candidate has to be a member of a population composed of other entities that reproduce and die at different rates. Individuals are objects of natural selection, but they do not evolve; only populations evolve.

As Richard Lewontin summarizes it, evolution by natural selection operates in any population in which there is variation, inheritance and differential reproduction/survival. When these three phenomena occur in a population, Darwinian selection will be at work. Populations that exhibit these features are

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204 This distinction will become particularly important in the next chapter, where I will introduce development, the approach to change appropriate to the study of change in individuals over the course of their lifecycle.
205 Lewontin 1970.
Darwinian populations, and the members of these populations are Darwinian individuals.

Evolution by natural selection is ‘survival of the fittest,’ a phrase coined by Herbert Spencer that Darwin later espoused as a better characterization of what he had in mind. But what do we mean by evolutionary fitness? In evolutionary biology, fitness is usually understood in terms of differential survival and reproduction, and the former in terms of the latter: survival matters because it increases reproduction potential. Understanding fitness as reproduction, however, presents some difficulties for my purposes because it is hard to imagine what reproduction would look like in a social system like the international system. If we are thinking of sexual reproduction, then reproduction is a meaningless concept for a social system like the international system.

The creation of new states is a candidate for something that resembles reproduction. There were about fifty states at the beginning of the twentieth century, seventy-five before World War II and 193 today. State creation, however, does not resemble sexual reproduction between two separate entities. State creation is closer to other forms of replication, like asexual reproduction, or cloning, or even growth, once we accept my hypothesis that the international system is an individual and start considering international system change from a developmental perspective. And then there is the structurationist perspective on

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206 Sober 2000.
207 Crawford 2006.
208 Wendt (2004: 309) makes this point.
the (re)production of social system in and through their instantiation in practice.\textsuperscript{209} Despite that we call this process reproduction, it bears little resemblance to what biologists mean by reproduction. Or does it?

As it turns out, reproduction is a tricky requirement, for biologists, since not all organisms reproduce sexually, such as insect colonies, symbiotic associations and ecosystems, and some do not even reproduce at all, like the mule. As Bouchard puts it,

> “Some biological systems (e.g., certain clonal organisms, certain colonial organisms, symbiotic communities and ecosystems) appear to be evolving; by that I mean they display adaptive change as a response to the selective pressures from their environments and these changes accumulate and are fine-tuned over time, which results in an increase the system’s capacity to survive. This adaptive change occurs in response to selection on the parts of the system. However these systems’ evolution is not adequately captured by a concept of evolutionary fitness that is defined solely in terms of differential reproductive success.”\textsuperscript{210}

It is therefore worthwhile to take a step back and ask why biologists believe sexual reproduction plays such an important role in evolution. One reason evolutionary biologists favor sexual reproduction as a mechanism for evolution is because it produces more variation (the offspring differ from both parents) than cloning, which replicates more exactly the single parent.\textsuperscript{211} However, their difficulty making sense of sexual reproduction in many cases of superorganisms and symbiotic associations, have led some evolutionary biologists to seek an

\textsuperscript{209} Giddens 1984; on the application of the concept of practice to IR, see Adler and Pouliot 2011a, 2011b.
\textsuperscript{210} Bouchard 2008: 562.
\textsuperscript{211} Except when rare mutations occur, but these are often not held to be sufficient to support evolutionary processes.
alternative conception of fitness. One of these conceptions, fitness understood as differential *persistence* is particularly interesting because it remains perfectly consistent with Darwinism, while having the advantage of being applicable to these difficult biological cases and, most importantly for my purposes, to social systems. Instead of emphasizing the reproduction element of the definition of fitness, it emphasizes the survival aspect, which is interpreted in terms of persistence over time.\textsuperscript{212}

“To understand the evolution of some clonal organisms, colonial organisms and symbiotic communities, fitness in terms of offspring number will not take us very far. The success of these systems is in their overall survival, not in the reproduction of some of their members. Thinking of evolution in terms of persistence instead of reproduction allows us to entertain complex cases of evolution.”\textsuperscript{213}

The notion of persistence plays an important role in biology. The essential characteristic of organisms is not their reproduction but their persistence ability. “Organisms are essentially persisters, systems that use energy to resist the forces of decay, and only contingently things that reproduce.”\textsuperscript{214} More importantly from an evolutionary perspective, fitness as differential reproduction is really about differential persistence. The goal of reproduction, from an information perspective, has always been persistence: the persistence of the information, coded in the gene, which is passed from one generation to the next via reproduction and inheritance. It is for this reason that Dawkins argued that we should focus our attention on the gene. Since they are copied with high fidelity,

\textsuperscript{212} See Bouchard and Rosenberg 2004; Bouchard 2008, 2011.
\textsuperscript{213} Bouchard 2008: 568.
\textsuperscript{214} Godfrey-Smith 2013: 25.
they are the best replicators; organisms reproducing sexually only imperfectly copy themselves in this sense (only 50 percent of the organism’s genetic information is passed on).\textsuperscript{215}

Having defined fitness as persistence, we can go back to the structurationist perspective on social reproduction, which is also about persistence, as should be becoming clear. When we talk about the reproduction of a given social structure, say marriage, we are really alluding to its ability to persist in a similar form over time and across contexts.\textsuperscript{216} The evolution of a social structure, in this perspective on persistence, is about the changes the social structure undergoes as its constitutive practices emerge and persist at different rates.

**Major Evolutionary Transitions to Individuality (METIs)**

For the past 30-40 years, evolutionary theorists, rather than assume a given unit of selection as Darwin (the organism) and Dawkins (the gene) had done, have been interested in explaining the emergence, through evolutionary processes, of evolutionary individuals themselves at every level of the biological hierarchy. Their research, known as the Major Evolutionary Transitions to Individuality (METIs) research program, is in the process of challenging Darwinian assumptions down to their core. METIs are critical junctures in evolutionary history where previously independent and competing individuals succeed in

\textsuperscript{215} Dawkins 1976.
\textsuperscript{216} Wendt 1999; Adler and Pouliot 2011a, 2011b.
suppressing conflict and fostering such a high degree of cooperation that they effectively form a new collective individual that itself becomes the object of natural selection. The emerging consensus in biology is that most biological individuals at every levels of the biological hierarchy – from the most basic multicellular organisms to complex societies – were, at some point of their evolutionary history, collections of independent lower-level individuals having undergone a METI.\textsuperscript{217}

Research on METIs began with the work of Lynn Margulis in the 1970s on the theory of the eukaryotic cell. Advances in molecular biology allowed Margulis and her colleagues to observe how eukaryotes (cellular organisms possessing a membrane) were assembled from the symbiotic association of previously independent prokaryotes (single-cells lacking a membrane), and not, as was previously believed, from a long and gradual process of complexification.\textsuperscript{218} Later, Leo Buss, John Maynard Smith, Eors Szathmary, and Richard Michod explored the broader implications of Margulis’ findings beyond the case of eukaryotes and worked on drawing the full implications of METIs for a general theory of evolution.\textsuperscript{219}

METIs comprise some of the most seminal events in evolutionary history, such as the transition from prokaryotes to eukaryotes, from single-cell (protists) to multicellular organisms, from solitary organisms to colonies, and from small

\begin{footnotes}
\item[217] Calcott and Sterelny 2011.
\item[218] Margulis 1981.
\item[219] Buss 2014; Maynard Smith and Szathmary 1995, 2000; Michod 1999. Two recent volumes address the theoretical and philosophical issues METIs raise: see Calcott and Sterelny 2011 and Bouchard and Huneman 2013. On the symbiotic origins of eukaryotic cells, see Margulis 1981.
\end{footnotes}
human groups to complex human societies, to name a few.\textsuperscript{220} Interestingly from an IR perspective, the last obstacle to the integration of humanity into a single superorganism appears to have been our very own anarchic international system, the political division of the globe into mutually exclusive, sovereign, territorial entities. Indeed, the formation of so-called nation-states has been seen as the last of the METIs, which immediately raises the fascinating question whether a METI could be occurring at the level of the international system itself, thus opening the gates for a dramatically greater degree of global social integration. Later in this chapter, I will tackle this very possibility and show that de-Darwinization processes actually do seem to be in the process of overcoming this last obstacle.

\textit{How METIs challenge traditional Darwinism}

METIs fundamentally challenge three aspects of traditional Darwinism, namely individual selection, the relationship between evolution and cooperation, and the importance of kin selection. First, METI research probably constitutes the most profound recent challenge to individual selectionism, the assumption that natural selection operates only on traditional categories of individuals (organisms or genes). METIs challenge individual selectionism at its core, by framing individuality not as a stable \textit{property} of genes or organisms, but as the outcome of evolutionary \textit{processes}.\textsuperscript{221} Indeed, if individuality is the product of evolution and most individuals were once groups, how can we assume that natural selection only operates on individuals (understood in the traditional sense)? This question

\textsuperscript{220} Maynard Smith and Szathmary 1995, 6-7.

\textsuperscript{221} Borrello 2005.
suggests that we need a mechanism like group selection, the idea that at one point individuals sacrificed their own interest in favor of the interest of the group, in order to explain the emergence of evolutionary individuals in the first place.

Since the 1960s, however, group selection had been seen as mistaken.222 The campaign against group selection began with the publication of George Williams’ influential *Adaptation and Natural Selection* in 1966, in which he systematically deconstructed purported cases of group selection by showing how each adaptation could plausibly be modeled as benefitting individual genes. Similarly, William Hamilton showed how altruism could be explained by organisms sacrificing their own interest in favor of the interests of a genetically-related kin, thus favoring the replication of similar genes (at the expense of the organism’s own life).223 Robert Trivers, and later Robert Axelrod and Hamilton, showed how cooperation could emerge from a small group of reciprocators and become resistant over time to invasion by opportunistic cheaters.224 Because finding individual-selection alternatives to group selection was generally possible, this seemed to demonstrate that group selection was unnecessary. By reconciling these different explanations with a new ontology of the biological world centered on the gene, the publication of Dawkins’ *The Selfish Gene*, was widely seen as having put the “final nail in the coffin that had been built for group selection ten years earlier by *Adaptation and Natural Selection*.”225

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222 Williams 1966.
223 Hamilton 1964.
224 Trivers 1971; Axelrod and Hamilton 1981.
225 Borrello 2005, 46.
Over time, as successive cohorts of students were socialized through textbook treatments of the group selection controversy, case-by-case evaluations gave way to a degree of dogmatism about individual selection. Individual selectionist explanations for a given adaptation, if one could be found, were increasingly given *prima facie* plausibility over group selection explanations of the same phenomenon. While Darwin himself had kept the ‘levels of selection’ question open, neo-Darwinian theory increasingly incorporated individual selectionist assumptions.\(^{226}\)

The belief that Darwinian processes only operate on individuals in the traditional sense remains widespread today. Unsurprisingly, this is the account of evolution that most IR scholars are familiar with. Contemporary biology, however, is in the process of shedding its dogmatic reductionism. In fact, the emerging, majority view is agnosticism about the level at which selection occurs. Multilevel selection posits that “natural selection can operate simultaneously at more than one level” and that the level at which selection operates should be determined on an individual case basis. “Contemporary biology recognizes that the living world displays a hierarchy of individuals at various levels, from genes to chromosomes, cells, organisms, colonies, social groups, species, communities, and ecosystems.”\(^{227}\) Indeed, many biologists who had been prominent critics of group selection, notably Williams and Hamilton, have since contributed to the revival of the idea. Williams, for example, wrote in a later edition of *Adaptation* that “even


\(^{227}\) Bouchard and Huneman 2013, 2.
without its producing biotic adaptation, group selection can still have an important role in the evolution of the Earth’s biota.”

“Even in the case of a very clear higher-level selection process,” Peter Godfrey-Smith acknowledges, “there will be some explanation in lower-level terms for why things happen as they do. It is easy, when following this road, to rule too many cases out.” Biologists increasingly recognize that while methodologically convenient, reductionism is in many cases simply not true.

While METIs challenge traditional individual selectionist assumptions that are often associated with Darwinism, in many ways, it also marks a return to Darwin himself, who remained puzzled by sociality and often suggested that sterile casts of social insects and human societies could be the bearers of adaptations. As he wrote in the *Descent of Man*,

> “it must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe ... an increase in the number of well-endowed men and an advancement in the standard of morality will certainly give an immense advantage to one tribe over another.”

The emerging consensus from research on multilevel selection echoes this insight: “individual selection promotes the fitness of individuals relative to others in the same group” and “group selection promotes the fitness of groups, relative to other groups in the global population.” Or, as Edward Wilson and David

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228 Williams 1996, xii.
229 Godfrey-Smith 2009: 112.
230 Darwin 1871: 500.
Wilson bluntly put it: “Selfishness beats altruism within groups. Altruistic groups beat selfish groups. Everything else is commentary.”

Second, research on METIs transforms our understanding of the relationship between cooperation and evolution. Rather than representing an exceptional outcome in an otherwise competitive evolutionary process, cooperation is shown to be a central driver of the evolution of so-called ‘Darwinian’ (selfish, competitive) individuals themselves. METIs thus shift our perspective on the relationship between cooperation and evolution from a focus on the evolution of cooperation to understanding how evolution, the emergence of new forms of life, occurs through cooperation. As I discuss in greater detail below, METIs turn the ‘problem of cooperation,’ explaining how cooperation can emerge given Darwinian individuals’ incentives to cheat, into the problem of explaining how different patterns of conflict and cooperation, at different levels, can produce different forms of Darwinian individuals at each level.

Third, many of the METIs, starting with the formation of eukaryotic cells from independent prokaryotes, were not ‘fraternal’ associations of genetically-similar individuals but ‘egalitarian’ associations of genetically heterogeneous individuals coming together to form new, higher-level symbiotic ‘superindividuals.’ This finding thus challenges traditional explanations for altruism based on kin selection and the belief that a common (genetic) identity is necessary for

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233 Axelrod and Hamilton 1981
234 Queller 2000.
cooperation. Given the importance of a common identity in IR explanations for the formation of supranational entities, this finding also has potentially interesting implications for IR, since it permits an understanding of the evolutionary character of cooperation among heterogeneous actors.  

*The two stages of METIs*

The central characteristics of METIs are a marked decrease in within-group conflict accompanied by a significant increase in within-group cooperation: together, these changes contribute to displacing upwards the level at which Darwinian selection occurs, at the level of the new group individual and its competitors. The process through which this transition occurs can be divided, for additional clarity, into two stages, through which a population de-Darwinizes and becomes a new higher-level Darwinian individual.

The first stage is the decline of conflict and the local emergence of cooperation among lower-level units. The central problem at this stage is to describe how cooperation could emerge locally despite selection pressures favoring selfish competition. “(Cooperative) behaviors pose a problem to evolutionary theory because — all else being equal — they would reduce the relative fitness of the performer of that behavior and hence be selected against.” For a METI to become possible, as Michod puts it, “lower-level units (must) relinquish their

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237 West, Griffin and Gardner 2007: 661.
claim to fitness, as it were, so that fitness may emerge at the new higher level.”

Thus, the conditions that make cooperation advantageous while discouraging defection will be located either in the structure of the group and/or of its environment.

In the second stage, the new emergent individual evolves adaptations enabling it to deal with potential cheaters. The generation of benefits at the level of the higher-level individual is both a cause and an effect of increased cooperation. However, there lies a tension: as shared benefits from cooperation grow, lower-level individuals have incentives to attempt to reap those benefits without paying the costs. What is more, while in the first stage the local emergence of cooperation was enabled by favorable environmental conditions, in order to survive in the face of changing environments that risk renewing lower level entities’ incentives to cheat, the new higher-level individual must now evolve general mechanisms of control that can exert a top-down pressure on would-be cheaters. These de-Darwinization mechanisms significantly improve the new individual’s capacity to survive in its environment and thus, arise through (and further enable) group selection. As Godfrey-Smith puts it, “both organisms and the cells within organisms form Darwinian populations, but a number of features of complex multicellular organisms partially suppress the evolutionary activities of their cellular parts.” This means that successful new evolutionary

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240 Godfrey-Smith 2009: 123.
individuals will also, in the second stage of the METI, acquire the attributes of physiological individuality (they will become organism-like entities), which leads us to ask what kind of organism they will be like, the question that I will address in Part B.

The ultimate achievement of a METI is the creation of a new higher-level ‘collective individual’ out of what were previously competing, independent individuals. A useful way to think about the kind of individual produced by a METI is as a ‘superorganism,’ which Elliott Sober and David Wilson define as a collection of organisms exhibiting the functional organization of a ‘single’ organism that is the object of selection pressures. Sober and Wilson’s take on the superorganism concept captures the essential characteristics of a METI: high cooperation, low internal conflict, common evolutionary fate (i.e. group selection) and organism-like functional organization. While the classic example of superorganism, social insect colonies such as ants and bees, have been well known going as far back as Darwin’s time, since the 1960s the concept of superorganism appeared to be discredited in mainstream biology, sharing the fate of group selection arguments. The belief in the irrelevance of group selection seemed to rule out taking superorganisms seriously as biological individuals: if groups could not evolve adaptations, how could they be genuine individuals, in a Darwinian sense? As I have already discussed, however, METIs have re-legitimated group selection and multilevel selection has become the majority position among evolutionary biologists.
How much cooperation and how little conflict are necessary for us to conclude that a METI is underway? As Edward Wilson rhetorically asked, “at what point does a society become so well integrated that it is no longer a society?”242 Sober and Wilson offer a solution based on differential selection pressures: “when between-unit selection overwhelms within-unit selection, the unit itself becomes an organism in the formal sense of the word.”243 This does not mean that within-group competition disappears completely. “Conflicts between levels of selection do not always result in one level ‘winning’ and another ‘losing’. Sometimes the result is a ‘compromise’, and the unit must be regarded as partially a collection of organisms and partially a superorganism in its own right.”244 A superorganism is in an important sense always a work-in-progress.

The other solution requires that we identify stage-two de-Darwinization mechanisms that can maintain the emerging individual in the face of changing environments. An important problem any METI faces is that, in the absence of mechanism sustaining and deepening cooperation at the higher level, Darwinian dynamics at the lower levels will put pressure on the new individual, which will risk devolving back to a Darwinian population. Ultimately, the challenge is thus to explain how Darwinian selection pressures at the lower levels have not disrupted integration at the higher level. In order to persist as an individual, the new entity must develop adaptations that actively de-Darwinize the relations

\[242\] Wilson 1975: 54.
\[244\] Ibid: 343.
among lower level, constituent units, defending the individual against Darwinian pressures that threaten disintegration at the lower-level.245

The emerging organization of the international system is the topic of Part B (chapters 3 and 4), where I will flesh out a physiological perspective on the METI. For now, I will focus on the first stage of the METI in the international system, and simply note that the emergence of cooperation and integration, if it is to last beyond the context of its emergence, needs to be complemented by the emergence of an organization that sustains individuality in the face of Darwinian pressures towards disintegration.

**Other characteristics of METIs**

Three additional characteristics of METIs are worth noting before I turn to the case of the emerging international system individual. First, the superorganism resulting from a METI has a dramatically increased capacity to know, adapt to and even manage its environment compared to the individuals of the pre-transition population. Social insects’ ability to communicate and coordinate their individual actions, for example, dramatically increases the geographic range of the colony and its ability to concentrate its foraging activities in high yield areas. As a result, insects living in colonies do better than those who do not.246

Second, METIs represent tremendous ecological successes. Social insects and humans dominate their respective ecosystems. As Hölldobler and Wilson note,

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245 Godfrey-Smith 2009.
246 Seeley 1995.
“although they represent only 2 percent of the approximately 900,000 known insect species in the world, (social insects) likely compose more than half the biomass.” “Environmental domination by ants and other social insects,” they conclude, “is the result of cooperative group behavior.” Similarly, the last of Maynard Smith and Szathmary’s major evolutionary transitions, the evolution of human society and language, can be considered an astonishing success from a strictly Darwinian perspective. Indeed, the physicist and engineer Paul MacCready calculated that 10,000 years ago, humans and their livestock constituted less than 0.1 percent of the total vertebrate biomass on the planet. Today, they constitute 98 percent of that biomass. This is in large part the result of increased sociality, which has had the effect of dramatically increasing our collective agency. “Over billions of years, on a unique sphere, chance has painted a thin covering of life—complex, improbable, wonderful and fragile. Suddenly we humans ... have grown in population, technology, and intelligence to a position of terrible power: we now wield the paintbrush.”

A last characteristic of METIs is that they are always incomplete. The superorganism never completely de-Darwinizes the relations among its parts. In every METI, challenges to the integrity of the whole will continue to arise and the whole never ceases working to achieve control over the parts. These can come from inside (e.g. malignant tumors) or outside (e.g. pathogenic bacteria). In ant

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247 Hölldobler and Wilson 2009: 5.
and bee colonies, workers retain the capacity to reproduce independently. In human societies, some individuals avoid paying their taxes.

What is important to note is that the superorganism’s struggle to achieve control over its parts, when successful, leads to the further evolution and development of adaptations dealing with defection. The immune system, for instance, can only develop in interaction with actual pathogenic threats. When it is not allowed to do so, it will not fully develop, as the case of germfree mice failing to develop an immune system illustrates. Thus, the continued presence of defection should not obscure the significance of the transformations brought about by a METI; the important distinction to make is that once a METI has taken place, defection takes place in a new environment in which the likelihood of punishment is greater. What is more, the successful management of defection often contributes to further integration.

To summarize, METIs are critical junctures in evolutionary history where groups of lower-level individuals cooperate to such an extent that they create a higher-level individual. METIs can be usefully divided into two stages: in the first stage, cooperation emerges and conflict is suppressed locally as a result of the combination of a particular population structure and environmental conditions, and in the second, general group-level adaptations emerge via group selection. The de-Darwinization of one level should not obscure the fact that Darwinian selection pressures continue to operate, but they are increasingly being displaced

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249 Eberl 2010: 454-455.
to the new level of the group-as-individual’s interactions with its own environment. METIs are always incomplete in the sense that defection by lower-level units remains possible, but successive adaptations arising in response to defection enable further consolidation. METIs are also very successful ecologically, largely as a result of the superorganism’s greater agency over its environment. Social life has enabled insect and human societies to conquer the globe and to achieve astonishing ecological success compared to other forms of life.

The METI in the international system: working hypothesis and plausibility probe

Having introduced concepts and theories that enable us to begin asking the question of the international system’s individuality, I will now formulate and defend the plausibility of the claim that the international system is in the midst of a METI.

From competition to cartel

I have discussed in the introduction how in the conventional picture, the international system is viewed as a competitive oligopolistic market. Using this analogy, which is very familiar and somewhat foundational in IR, we can describe the international system METI in terms of the transition from a competitive to a
cartelized oligopoly. This description is a good introduction to my plausibility probe of the METI hypothesis in the next section.

Saying that a METI has occurred amounts to saying that a stable and self-reinforcing, cartel-like, collusive arrangement has stabilized among the firms in a market. While they formerly worried about each other and competed, they are now colluding, cooperating and coordinating as one in order to exploit their environment, the market. As I will discuss in greater detail in chapter 4, the production of a shared monopoly over meta-political authority in world politics is the good that the international system is monopolizing.

Of course, as economic theory helps us see, cartels are difficult to maintain, and often revert back to oligopolistic competition as incentives to cheat lead to the unraveling of cooperation. In IR, we are familiar with this logic: it is essentially what Realists have been arguing throughout the 1980s and 1990s with the help of concepts like the security dilemma. Robert Jervis’ take on the periodic emergence of short-lived ‘concert’ arrangements in the system offers an illustrative starting point. Cartels and concerts both rest on ‘concerted action.’ Concerts are maintained primarily in order to avoid the destruction that would come from conflict among its constituent parts. Cartels also seek to avoid destructive conflict among constituents, but the primary goal is to achieve and maintain a shared monopoly over the production of some good. While competing oligopolies are oriented toward one another (the focus is within the system), oligopolists in a


\[251\] See the discussion in Mitzen 2013: 1-3.
cartel are oriented towards their outside: their main interest, once cooperation has been secured, is preserving the domination of a group over other actors. Although this aspect is usually secondary to the revisionist great power threat in IR discussions of the Concert of Europe, the Concert was also oriented towards its outside, as it served to perpetuate monarchical authority in the face of the emergence of radical social movements.

For a number of reasons, using Jervis’ reasoning, we have reasons to think that the cartelization of the international system can be a stable arrangement. According to Jervis, concerts are the exception to normal balance of power dynamics in the international system. For a number of reasons, concerts typically emerge following devastating hegemonic wars. Crucially, following major wars, the devastation is such that war ceases to be expected in the short to medium term. Concerts become unstable over time because, as states recuperate from war’s devastation and successive generations forget the costs of war, states can once again foresee war on the horizon, begin preparing for war, and thus, reenter a balance of power world characterized by the security dilemma.

The key insight here is that, for a Realist-Darwinian world to obtain, war must remain a distinct possibility. As Waltz puts it, “in international politics,” where no structural constraints are in place to prevent war, “force serves, not only as the ultima ratio, but indeed as the first and constant one.”\textsuperscript{252} Jervis lists four necessary assumptions for the operation of a balance of power system: (1) two or

\textsuperscript{252} Waltz 1979: 113.
more actors with more or less equal power; (2) self-regarding states wanting to survive; (3) states must be able to ally with each other on the basis of short-term interests; and (4) “war must be a legitimate instrument of statecraft.”

The last one is the most important. Without the perception that war is on the horizon, none of the realist propositions (security dilemma, arms races, and relative gains concerns) necessarily follow. In terms of the Prisoners’ Dilemma, the possibility of war increases the cost of getting cheated and under conditions of offensive advantage, the payoff from striking first.

How can a structural configuration that makes concerts possible and stable be achieved under anarchy? In the Prisoners’ Dilemma, any transformation that increases the gains from mutual cooperation (CC), minimizes the incentives from unilateral defection (DC), decreases the pain from getting suckered (CD) and/or makes more prohibitive the cost of mutual defection (DD), improves the prospects for cooperation. The argument I want to make is that a number of observations suggest that characteristic conditions of the periods immediately following hegemonic wars are now permanently operating features of the global environment, starting with the perception that inter-state war has become too costly. The international system is experiencing a METI: the concert/cartel has become the norm, and the balance of power/competitive market, the exception.

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253 Jervis 1985: 60.
**Working hypothesis**

My claim that the international system is in the midst of a METI should be seen as a ‘working hypothesis,’ a concept that has its philosophical roots in American pragmatism.\(^{255}\) John Dewey defines working hypotheses as propositions that are not meant to be definitively tested immediately, but whose primary function is to “direct inquiry into channels in which new material, factual and conceptual, is disclosed, material which is more relevant, more weighted and confirmed, more fruitful, than were the initial facts and conceptions which served as the point of departure.”\(^{256}\) In the absence of systematic empirical evidence enabling us to discriminate among alternative hypotheses, a working hypothesis should thus be judged by its expected payoff (theoretical, empirical and/or normative) and its empirical plausibility, which should be deemed sufficient to warrant investing additional time and resources in further refinements and tests. Moreover, because the argument in this chapter makes possible and motivates the arguments of Parts B and C, it will only be possible to fully assess the payoff of the argument I am making by looking at the dissertation as a whole.

**Plausibility probe of a hard case**

As my earlier discussion makes clear, given existing theory, of all of the possible levels of human interaction, the international system appears to be the hardest, ‘least likely’ case for a METI.\(^{257}\) Indeed, the international system is the rock on

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\(^{255}\) Murphy 1991.
\(^{256}\) Dewey 1938: 142-43.
\(^{257}\) Eckstein 2000.
which sociobiologists’ million-year wave of human social integration, from the development of language to the evolution of culture, typically breaks.\textsuperscript{258} As I have been suggesting, IR theory itself has for the most part echoed this conclusion by likening the international system to a conflictual Darwinian environment and self-reproducing anarchy. Given how commonsensical these analogies appear to us, one will naturally wonder why I have not used METIs to account for the comparatively easier case of individual-state formation. This would have presented the advantage of covering well-trodden grounds, since while rarely stated explicitly, analogies between the state and (super)organisms have a long history in social and sociobiological thought.\textsuperscript{259} The evolutionary biologist Julian Huxley was not alone in considering the state to be a most “unwieldy” individual, “huge with possibility,”\textsuperscript{260} and in IR, Wendt has already made a plausible case that individual states are at least superorganisms.\textsuperscript{261}

Despite these considerations, the international system METI case can be made for three reasons. First, as I will make the case shortly, the international system METI hypothesis appears plausible empirically. To test whether contemporary transformations in the international system meet these criteria, I conduct a plausibility probe, which Harry Eckstein defines as “attempts to determine whether potential validity may reasonably be considered great enough to warrant

\textsuperscript{258} See Thayer 2004.
\textsuperscript{259} One exception is Wendt (2004), who has argued that the state could be plausibly seen as a superorganism.
\textsuperscript{260} Cited in Godfrey-Smith 2013: 17.
\textsuperscript{261} Wendt 2004.
the pains and costs of testing.”

Second, the theoretical payoff in the case of the international system is greater. The belief that the state itself has an organism-like organization merely reinforces our intuitions about the difficulties of international system-level integration. The successful application of the METI hypothesis at the system-level, on the other hand, would thoroughly challenge this orthodoxy and open up new theoretical and practical possibilities. Third, while plausibility probes do not necessarily require difficult tests, harder tests increase our confidence in both the plausibility of the hypothesis and the generalizability of the mechanisms posited. If successful, the application of METI theory and of the novel physiological and developmental concepts, mechanisms, and theories that I will introduce, for the first time in IR, in chapters 3 to 6, to the case of the international system, should correspondingly increase our confidence that they will be applicable to less controversial cases of individuals.

From the previous discussion, thus, we can say a group is in the midst of a METI when the following changes are occurring simultaneously: (1) the level and intensity of within-group conflict is markedly decreasing, (2) the level and intensity of within-group cooperation is significantly increasing, (3) within-group behavior is becoming more regulated and organized, and (4) the pressures from conflicts between the group and other entities in the group’s environment

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262 Eckstein 2000: 141.
263 Ibid.
progressively outweigh the pressures from within-group conflict (group selection dominates individual selection).

Another important indication that a system is becoming an individual, and that it is likely to persist as an individual beyond the context of its emergence, is the evolution, development and operation of de-Darwinization mechanisms – most importantly higher-level cognition, immune reaction, and the control of reproduction. Because they more properly belong to a physiological perspective, however, I leave the discussion of these mechanisms to chapter 3 and the description of their operation in the case of the international system to chapter 4. In the present chapter, I focus exclusively on the ‘outward’ signs of the transformation, namely: the emergence of cooperation and integration, the decline of conflict, and the creation of an internal and external international environment through the de-Darwinization of the internal environment of the system, and the displacement of natural selection forces to the external environment that results from this de-Darwinization. I am not arguing that these phenomena cause a METI or that the METI causes them. Rather, I am arguing that, together, these phenomena constitute a METI.\textsuperscript{264}

I will argue that international political dynamics since the Second World War, and particularly in the last three decades, meet all four criteria of a METI and that this suggests that the international system is de-Darwinizing. I will argue that there is substantial evidence of (1) a significant decline in violent inter-state

\textsuperscript{264} Wendt 1998.
conflict, most importantly the disappearance of major war, which had constituted in centuries past the principal mechanism of change in international politics, (2) a significant increase in inter-state cooperation, (3) a parallel quantitative and qualitative increase in inter-governmental organization, and (4) myriad evidence that a boundary between the internal and external environments of the international system is emerging and that natural selection pressures are increasingly occurring in the latter: namely, the virtual disappearance of state death and territorial conquest, the growing benefits from membership in the international system, and the discernible shift in typical international security concerns, from individual states worrying about other states to the international community’s collective security concerns about violent non-state actors and other threats external to the international system itself.

These various international political trends are not new nor are they mysterious at all; they have been the bread and butter of Liberal and Constructivist research in the last 30 years. They have not, however, been described in terms of a single evolutionary account that fundamentally challenges the way we think about the ontology of the international system. Indeed, for the most part, IR scholars have continued to think about these transformations through the traditional prism of the international system as an anarchic, Darwinian population and environment.

Before moving forward, it is important to point out that my strategy, once I have made the case that all of the elements of a METI are taking place, is not to turn to highly discriminating empirical testing of METI propositions. My objective is to
offer a comprehensive redescription of the international system, of how it was put on the tracks to individuality (its recent evolution), how it maintains itself on those tracks (its physiology) and where those tracks can take it in the future (its developmental potential). In order to accomplish these objectives, I have to keep moving forward. Once I have made the case that all of the indicators of a METI are there, I will exploit this possibility and flesh out its implications, stopping only to assess the plausibility of the story I am telling, in the hopes that the hypothesis generates enough forward momentum to generate interesting and useful novel insights and observations about contemporary international politics.

The decline of inter-state war

The first indication that the international system is experiencing a METI is the increasingly well-documented and accepted decline of inter-state war over the last couple of centuries, accelerating after the Second World War and after the end of the Cold War. The decline of inter-state war was first noted in IR in the second half of the 1980s,\textsuperscript{265} and the declinist thesis has picked up significant momentum in the last decade,\textsuperscript{266} especially during the last 5 years.\textsuperscript{267}

Steven Pinker’s bestseller \textit{The Better Angels of Our Nature} constitutes the most complete treatment of the decline of inter-state war and in most other categories of human violence.\textsuperscript{268} Robert Jervis echoes the majority view when he concludes that that Pinker “has succeeded in documenting the enormous decline in all sorts

\begin{footnotesize}
\begin{enumerate}
\item Gaddis 1986; Mueller 1989.
\item Jervis 2002; Mueller 2004; Väyrynen 2006.
\item Goldstein 2011; Pinker 2011; Gleditsch 2013.
\item Pinker 2011.
\end{enumerate}
\end{footnotesize}
of violence and cruelty” and that “this achievement of humankind deserves to be better known, and readers of this important book will remember it and ponder its causes.” In his introduction to a recent symposium on the topic, Nils Petter Gleditsch concurs that, “despite the various critiques, there is wide agreement on the decline of war and other forms of violence.” Indeed, the declinist thesis has been endorsed by a number of prominent military historians and is increasingly recognized as a ‘fact’ by a majority of IR scholars. To the great military historian John Keegan, “after a lifetime of reading about the subject, mingling with men of war, visiting the sites of war and observing its effects, (war) may well be ceasing to commend itself to human beings as a desirable or productive, let alone rational, means of reconciling their discontents.”

As Pinker puts it, the most surprising number about the decline of war is ‘zero.’ As Table 2.1 illustrates, many historically common kinds of violent inter-state conflicts have not occurred at all in the last 60 to 70 years.

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269 Jervis 2011: 64.
270 Gleditsch 2013: 399.
271 E.g. Luard 1986; Keegan 1993; and Howard 2000.
272 All of the participants to a 2013 symposium in the International Studies Review agreed on the ‘fact’ of the decline of inter-state war. See Gleditsch 2013.
Table 2.1 – The most interesting statistic about interstate war since 1945: zero

Zero is ...

1. “... the number of times that nuclear weapons have been used in conflict.”

2. “... the number of times that the two Cold War superpowers fought each other on the battlefield.”

3. “... the number of times that any of the great powers have fought each other since 1953 (or perhaps even 1945, since many political scientists don’t admit China to the club of great powers until after the Korean War).”

4. “... the number of interstate wars that have been fought between countries in Western Europe since the end of World War II. It is also the number of interstate wars that have been fought in Europe as a whole since 1956, when the Soviet Union briefly invaded Hungary. Keep in mind that up until that point, European states had started around two new armed conflicts a year since 1400.”

5. “... the number of interstate wars that have been fought since 1945 between major developed countries (the forty-four with the highest per capita income) anywhere in the world (again, with the exception of the 1956 Hungarian invasion).”

6. “... the number of developed countries that have expanded their territory since the late 1940s by conquering another country”

7. “... also the number of times that any country has conquered even parts of some other country since 1975, and it is not far from the number of permanent conquests since 1948.”

8. “... the number of internationally recognized states since World War II that have gone out of existence through conquest.”

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274 Adapted from Pinker 2011: 249-251.
The most important of these notable absences are the complete absence of any war opposing two or more states recognized as Great Powers since the Korean War (1951-1953) and the complete absence of any war opposing two or more ‘major developed countries,’ operationalized as the 44 countries having the highest per capita income, since the Soviet invasion of Hungary (1956).275

There is a growing consensus that the decline of inter-state war has, like the democratic peace, become a ‘fact’ in need of explanation that few scholars dispute,276 and given the historical importance of major war as a driver and mechanism of change in international politics,277 this is one of the most important puzzles in IR today. Although the Long Peace is “a centrally important empirical fact,” Thayer notes, “the cause, or causes, of this fact is less obvious, although each major theory of international politics offers an explanation.”278 Indeed, scholars have argued that the decline of war is caused by normative evolution,279 learning,280 nuclear weapons,281 bipolarity and unipolarity, US hegemony, the prohibitive cost of war,282 the democratic (or Liberal, or Capitalist283) peace, the industrial/commercial revolution,284 economic interdependence,285 international organizations, collective security, the whole

276 Notable critiques are Braumoeller 2013 and Fazal 2014.
277 Gilpin 1981.
278 Thayer 2013: 405.
283 Gartzke 2007; Gartzke and Hewitt 2010
284 Gat 2006.
Kantian tripod,\footnote{The Kantian tripod: democracy, trade, IOs. See Oneal and Russett 1999.} the declining value of territory, the norm against territorial conquest,\footnote{Spruyt 2006; See Zacher 2001.} peacekeeping,\footnote{Goldstein 2011.} the spread of security communities,\footnote{Adler and Barnett 1998.} or by different combinations of these. The diversity of plausible explanations and our inability to pinpoint causes suggest that the outcome is probably overdetermined.\footnote{Jervis 2002: 9.}

Determining the causes of the decline of war is admittedly a very important endeavor. Without insights into its causes, we cannot know with confidence if the decline will continue into the future and we lose much of our ability intervene on the ‘real world’ to make sure that it does. My argument is that the decline of inter-state war is one of a number of indicators that the international system is experiencing a METI. Since I am not arguing that the METI caused the decline of inter-state war, but that the decline of conflict is only one aspect of what a METI is, it is beyond the scope of this dissertation to join the debate on the causes of the Long Peace. All that I need to show for the sake of the argument I am making is that the decline of war is a significant trend.

While I have suggested that there is a growing consensus among students of war that the decline in interstate wars is a fact, before moving forward I think it is important to address the two most notable challenges. First, I will discuss Tanisha Fazal’s claim that the apparent decline is probably, to a significant extent, partly an artefact of the increase in wounded-to-killed ratios as a result of
improvements in battlefield medicine. Second, I will engage Braumoeller’s claim that the declinist thesis is based on faulty reasoning about the probabilistic character of war and on the failure to control for two confounding factors: political relevance and the number of states in the system.²⁹¹

Fazal offers an interesting challenge to the declinist literature: the decline of war, she argues, might be an artefact of war becoming less fatal as a result of improvements in battlefield medicine and the growing use of protective equipment. “The data suggest that battle deaths declined more than twice more quickly than battle casualties during this time frame.” “If this is true,” she suggests, “then it may be premature to declare victory on war.”²⁹² While her argument raises interesting questions about the magnitude of the decline in war, for a number of reasons, as she recognizes herself in the article, her challenge is far from decisive, and ultimately, her findings reinforce certain declinist arguments.

First, Fazal is not arguing that taking into account increasing wounded-to-dead ratios invalidates the declinist thesis, but only that this raises questions about the steepness of the decline. Indeed, despite the boldness of the title of her article – “Dead Wrong” – she concedes that:

“[M]ore data on the battle wounded are needed before making a true comparison between the decline in battle deaths and the incidence of battle casualties. Second, the available data suggest that, even accounting for the battle wounded and notwithstanding

²⁹¹ Fazal 2014; Braumoeller 2013.
improvements in medical care in conflict zones, the number of casualties of war still fell. This finding tempers, but does not negate, the empirical claim made by Goldstein and Pinker about the decline of war more generally. Indeed, in many ways it is consistent with their arguments. Improvements in medical care in conflict zones are partially a result of the humanitarian revolution celebrated by the declinist theory of war.”293

Second, the declinist thesis is based on more than the decline in battle deaths. Among a number of meaningful zeros, the most surprising is probably the absence of war between ‘great powers’ and ‘developed states’: the “decline of major war.” The frequency of interstate wars in general has also significantly declined significantly. Admittedly, given the 1000 battle deaths criterion, as Fazal argues, the number of battle deaths ends up creeping into our frequency counts. But how significant is this? How many wars make it to the dataset once we relax the 1000 battle deaths criterion enough to accommodate the increase in wounded-to-dead ratio? Fazal does not tell us and one suspects that the number will not cancel the decline. Third, and relatedly, the farther we move back in history, the less information we will tend to have about conflicts (especially about lower-level ones). With the revolution in information technologies, smaller scale wars are more likely to make it to the dataset if they occurred during or after the 20th century. In all likelihood, given “historical myopia”, declinist accounts are probably understating the decline.

Fourth, of the four countries (USA, France, Russia and Israel) on which she bases her conclusion that wounded-to-killed ratios have increased, only Israel has fought conventional state adversaries with comparable size and capabilities since the US engaged Chinese armies in the Korean War. Unsurprisingly, we notice a decrease in the wounded-to-kill ratio for Israel precisely at the time of the Yom Kippur War (1973). If battlefield medicine was all there was to these figures, we would have to conclude that battlefield medicine in Israel regressed at that time.

A more plausible conclusion is that intense tank battles between more evenly matched armies in that conflict created correspondingly high battlefield casualties. Indeed, parallel to the improvement in battlefield medicine, there has

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also been a dramatic increase in firepower and the development of modern force employment systems. Stephen Biddle argues that what he calls the “modern system” of force employment, “a tightly interrelated complex of cover, concealment, dispersion, suppression small-unit independent maneuver, and combined arms at the tactical level, and depth, reserves, and differential concentration at the operational level of war”, enables modern military powers to concentrate firepower and minimize their own exposure to their opponents’ firepower. “Militaries that fail to implement the modern system have been fully exposed to the firepower of modern weapons – with increasingly severe consequences as those weapons’ reach and lethality have expanded.” As a result, there is now “a growing gap in the real military power of states that can and cannot implement the modern system, but surprisingly little change over time in outcomes between mutually modern-system opponents.” Two implications flow from Biddle’s thesis. First, if the four states she examines had fought conventional wars against adversaries similarly equipped and organized, their wounded-to-kill ratio would have been likely to suffer accordingly, as has the US during World War II. Second, as a consequence, the increase in wounded-to-dead ratio might be an artefact, not only of improvements in battlefield medicine, but also the asymmetric nature of the conflicts these states have been fighting and the application of the modern system against non-state foes.

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295 Biddle 2004: 3.
296 Ibid: 3.
What happens when two countries employing the modern system fight each other? To give us an idea, Biddle runs a battalion-level simulation to see what could have occurred if the Iraqis had employed the modern system. The result is a dramatic increase in “US vehicle losses ... from two in the base case to almost fifty (more than 70 percent of total US strength) in the excursion scenario results, while Iraqi losses fall from eighty-six to about thirty, even given the technological advantages of the M1A1, the effects of Coalition air supremacy, and the skilled handling of the US attack.”  

From these results, one can only imagine losses ratios if a US-Soviet war had occurred. In such a scenario, one suspects that all of the combat medicine in the world would probably not have sufficed to overcome the effects of the dramatic increase in firepower. When fighting materially inferior armies and non-state actors, however, the result is that the side employing the modern system can largely shield itself from the adversary’s firepower and concentrate its own with devastating effect.

The second challenge I want to address comes from a working paper by Braumoeller in which he critiques two declinist arguments that are immediately relevant to my purposes: the decline of major war thesis, which is often referred to as the ‘Long Peace,’ and the decline in all forms of interstate war. I discuss each critique and raise questions about their decisiveness in turn.

Braumoeller critiques the decline of major war thesis on statistical grounds. If we assume an average of two major ‘systemic’ wars per century, the average for the

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297 Biddle 2004: 186.
298 Gaddis 1986 coined the phrase.
five centuries preceding the Long Peace, Braumoeller correctly argues that “it would still take about 150 years of uninterrupted peace for us to reject conclusively the hypothesis that the underlying probability of systemic war remains unchanged.”\textsuperscript{299} In other words, given the rarity of systemic wars, we would have to wait until the year 2095 to confidently celebrate their end. When Braumoeller refers to “Great Power wars” or “systemic wars,” what he has in mind are what Jack Levy refers to as “General Wars”. These are, following Levy’s own definition, wars “involving nearly all the Great Powers and resulting in high levels of destruction,”\textsuperscript{300} which he operationalizes as wars involving at least two-thirds of the Great Powers in a given era and that cause more than one thousand battlefield deaths per million population. This operational definition yields a list of nine General Wars (see table 2.2 below), which is the baseline that Braumoeller uses to argue that the average number of wars in the five centuries before the Long Peace was about two wars per century.

\textsuperscript{299} Braumoeller 2013: 6. Using conventional 95\%, one-sided confidence interval.
\textsuperscript{300} Levy 1983: 75.
I want to draw attention to two problems with Braumoeller’s argument about the Long Peace. The first is that it is based on a different definition of Great Power wars than what Pinker, and John Mueller and Levy before him, have in mind. When Pinker and Mueller talk about the “end of major war,” they mean the end
of wars opposing two or more great powers. Indeed, Levy defines Great Power wars as wars that “involve at least one Great Power on each side of the conflict.”\(^3\) Of course, while all General Wars are also Great Power wars, only a fraction of Great Power wars escalate to become General Wars. Because Great Power wars have been so frequent historically, their complete absence since the Korean War is an even more astonishing fact than having avoided World War III. Table 2.3 below shows the frequency of these two types of wars and of a third, even more inclusive category: interstate wars involving at least one Great Power.

<table>
<thead>
<tr>
<th>Type of war</th>
<th>Frequency (1495-1975)</th>
<th>Mean frequency per century (1495-1975)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate wars involving a Great Power</td>
<td>119</td>
<td>24</td>
</tr>
<tr>
<td>Great Power wars</td>
<td>64</td>
<td>13</td>
</tr>
<tr>
<td>General Wars</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

Now, the remarkable statistic about Great Power wars is, again, zero. Zero Great Power war since, perhaps, if we count China as a Great Power in 1953, the Korean War. The Long Peace is not only the absence of world war since 1945, it is, even

\(^3\) Levy 1983: 75.
more astonishingly, also 62 years without a single war involving at least one Great Power on both sides.

Following Braumoeller’s logic, we can calculate how long we would have to wait until the Long Peace, now defined as the absence of Great Power war since the Korean War, becomes significant. First, we get the average frequency of Great Power wars per century in the five centuries preceding the Long Peace. To calculate these, we can refer to table 3.1 in Levy’s *War in the Modern Great Power System*.302 We get 64 Great Power wars out of the 119 wars ‘involving’ at least one Great Power, which gives us an average of about 13 wars per century for the five centuries preceding the Long Peace. Using Braumoeller’s reasoning, given an average of 13 Great Power wars per century, the probability of 62 years of Great Power peace since the last shots of the Korean War were fired is 0.00018. How many years of peace should we wait until we can be confident (still at the conventional 95% level)? The answer is 22 years. We can say that the Long Great Power Peace has been significant since 1975. Given the relatively much greater frequency of Great Power wars and how routine they have been in the history of the state system, their complete absence for the last 62 years is the most surprising and consequential declinist fact.

One could object that General Wars are a different species of war and argue that we should look at them in isolation from Great Power wars. I do not think this would be a sensible assumption, however, and from what I can tell, this is not one

302 Ibid: 70-73.
that Braumoeller himself would make. Indeed, following his own bargaining model of war logic, if we want to understand the propensity for General War, we should look, not at historical numbers of casualties, but at the Great Powers’ propensity to run the risk of events escalating, out of their control, to a General War. Braumoeller argues that deaths-from-war-per-capita are a bad measure of the propensity for war, because (assuming a bargaining model of war) war is a gamble. Decision-makers do not know ahead of time how far war will escalate and when it will end. Thus, because war deaths cannot enter into the decision for war, they cannot serve as proxy for war propensity. As such, “the only reasonable metric is the willingness to ‘roll the dice’ in the first place.”

“The best way to gauge the warlikeness of nations would be to measure the frequency with which they run the risk of war. Initiating a war, or issuing a threat that creates the risk of war, is indicative of the willingness, in the worst case, to spill quite a bit of blood; that willingness is the best indicator of the propensity of the state to engage in violent conflict...”

Following this logic, I think that the absence of Great Power wars for the last 62 years tells us a great deal about their willingness to run the risk of uncontrolled escalation to General War: they want no part of it. Another reason why we should look at the number of Great Power wars, and not General Wars, is precisely because the latter are such rare events than we can infer comparatively very little about their non-occurrence. Great Power wars exhibit much more stable probabilities, and as such, we can draw more reliable inferences from them.

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303 Braumoeller 2013: 9.
Braumoeller’s second criticism targets the broader claim that *interstate war as a whole has declined*. The problem at this level is what he sees as a faulty understanding of the process of war. Existing analyses err in a number of ways. First, arguments that control for population size are fallacious, he argues, because population growth is exponential and we should not expect death from war to be exponential. Second, based on the above-mentioned bargaining model of war logic, we need to replace battle deaths as a measure of propensity for war. “The individual conflict incident, or militarized dispute,” he argues, “is the most reliable objective indicator of that willingness.”

Instead of looking at battle deaths or the frequency of actual wars, Braumoeller looks at militarized interstate disputes (MIDs) and more specifically, ‘uses of force’ (the fourth level on the 5-level scale of MIDs) and interstate wars (the fifth and final level on the scale). Uses of force, understood as the last step before escalation to full-scale war, are a good proxy for the willingness to run the risk of war. In addition, he seizes the opportunity to control for two important factors – the number of states in the system and geographic proximity – which are usually not taken into account in declinist analyses.

Controlling for the greater number of smaller, weaker and geographically distant states, and therefore, for the large number of ‘irrelevant’ dyads unwilling or unable to fight, makes the decline in war evaporate. Braumoeller’s analysis of level-5 MIDs shows that “the downward trend has clearly reversed itself: though

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305 Ibid: 10.
there is a fair bit of noise, the overall trend is slightly upward and has held steady at a higher rate during the Cold War than in previous periods.”306 “The general trend more closely resembles a random walk than a steady decline.”307 Braumoeller is not alone in arguing that war has not declined. Recently, two economists, Harrison and Wolf, also using the COW-MID data, have similarly argued that “wars are becoming more frequent, and the trend has been steadily upward since 1870.”308 Harrison and Wolf’s article was criticized in depth in a reply by Kristian Gleditsch and Steve Pickering, who pointed out that the COW-MID dataset is one of the rare conflict datasets that does not show a decline in conflict after the end of the Cold War.309 Since many of the problems they identify in their piece focus on the nature of COW-MID data, their critique also applies to Braumoeller’s analysis.

First, Braumoeller focuses on level-4 incidents, ‘uses of force.’ This is a sensible move, since in the MID dataset, this is the level immediately preceding inter-state war. For many level 4 cases, however, the link between the so-called ‘use of force’ and the ‘willingly risking war’ is non-obvious. As Gleditsch and Pickering note, “only 313, or about 20 per cent, of the 1,553 MIDs that involved ‘use of force’ entail any recorded fatalities.”310 What is more, the ‘use of force’ category includes benign incidents such as the seizure of four US fishing vessels by

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309 Gleditsch and Pickering 2014.
310 Ibid: 220.
Canada, a case that was ultimately adjudicated in Canadian courts.311 While I agree with Braumoeller that we need data that better captures the willingness to risk war, I think the ICB data might be more appropriate, because it explicitly includes the high probability of war as a criterion for case selection.312 Interestingly, the ICB data picks up a decline in interstate crises since WWII.313

A second important problem with MID data echoes the point I made above about historical myopia: the farther back we go in time, the more likely it is that militarized disputes will be undercounted. “Much of the apparent increase in MIDs is likely to be a result of greater media coverage over time.”314 This is also likely to apply to level-4/uses of force cases, which can include relatively banal incidents such as the seizure of fishing vessels. This means that the COW-MID dataset would most likely record an increase in MIDs even if the underlying rate of MIDs had stayed the same throughout history.

Finally, even if we were to accept the argument that the frequency of military events short of war has increased, this does not necessarily mean that the propensity of states to wage war has also increased. In fact, it could mean the exact opposite. Following the same logic as the stability-instability paradox, it could very well be that states are now more willing to escalate hostilities short of war because they confidently expect (or even ‘know’) that hostilities will not

311 Ibid.
312 An international crisis is defined as “a threat to one or more basic values, along with an awareness of finite time for response to the value threat, and a heightened probability of involvement in military hostilities.” Brecher and Wilkenfeld 1997: 3.
313 Gleditsch and Pickering 2014.
escalate all the way to war. If anything, as Gleditsch and Pickering rightly note, observing a decline in the frequency of interstate wars, given an increase in the 'propensity' of states to risk war, raises an interesting puzzle: what explains that the declining rate of MIDs escalating to war?\textsuperscript{315} Solving this interesting puzzle, however, is well outside the scope of this dissertation.

\textit{The increase in international cooperation, organization, and integration}

Parallel to this marked decline of inter-state war, there has been a dramatic increase in the scope and degree of inter-state cooperation, organization and integration over the same period. While the modern international system is admittedly not the first states system in history to exhibit a high degree of cooperation as well as the development of rules and norms of interactions (the ancient Greek, ancient Chinese and Indian state systems were rule-governed as well),\textsuperscript{316} none of these historical state systems has achieved the kind, scope and degree of international organization that characterizes the post-World War II international system.

Since 1945, there has been well-documented, dramatic increase in the number of and participation in international organizations.\textsuperscript{317} While the seeds of that growth in international cooperation and organization had been planted during the 19th century, with the establishment of the Concert of Europe, the Hague system, and public international unions, germinating in the failed attempt at a comprehensive

\textsuperscript{315} Ibid: 227.
\textsuperscript{316} Wight 1977.
\textsuperscript{317} Katzenstein, Keohane and Krasner 1998.
system of international organization of violence that was the League of Nations following the disaster of the First World War, it is really after World War II, with the birth of the UN system, that global integration of such scope and scale became possible.\textsuperscript{318}

The most important transformation is perhaps the widespread acceptance of multilateralism, which John Ruggie defines as “an institutional form which coordinates relations among three or more states on the bases of ‘generalized’ principles of conduct.” Multilateralism has become the normal and expected ‘practice’ in inter-state relations.\textsuperscript{319} As Vincent Pouliot observes, “especially in the last few decades, multilateralism has turned into the ordinary process by which international relations get conducted: actors and even observers have come to think from multilateral diplomacy and less so about its opportunity.”\textsuperscript{320}

Coercion, which has traditionally been the hallmark of state sovereignty, at least in its dominant Weberian conception as a “monopoly on the legitimate use of violence”, would appear to constitute a ‘hard case’ for multilateralism. Today, however, coercion is increasingly channeled through international organizations and the UN Security Council in particular. As Alexander Thompson notes, “intervention without some effort to gain approval is now virtually obsolete, a remarkable feature of contemporary international relations that merits both theoretical and policy attention.”\textsuperscript{321} Multilateralism provides many advantages

\textsuperscript{318} Claude 1964.
\textsuperscript{319} Ruggie 1992: 571.
\textsuperscript{320} Pouliot 2016: 26.
\textsuperscript{321} Thompson 2006, 2.
and constitutes a “rational choice” in an increasingly global and interdependent world.\textsuperscript{322} In recent decades, multilateralism has also become more ‘complex’, in the sense that it increasingly involves multiple kinds of actors and often overlapping regimes.\textsuperscript{323} Indeed, while intergovernmental organizations have peaked right before the end of the Cold War and have since stabilized at a slightly lower level, around 250, international non-governmental organizations have grown continuously since 1945.

We have strong theoretical reasons to believe that the growth of cooperation and the decline of inter-state wars are intimately related dynamics. On the one hand, the growth of cooperation, multilateralism and interdependence generate gains that also contribute to making the opportunity cost of war greater.\textsuperscript{324} This relationship has received much empirical support and has recently been formalized.\textsuperscript{325} On the other hand, more extensive international cooperation is made possible by the decline of war. As Realists have argued throughout the 1990s, the expectation of war pressures states, not only to worry about the possibility that their partner might cheat on an agreement, but also to worry that they might convert the gains from cooperation into military advantage in the future.

“Realism’s identification of the relative gains problem for cooperation is based on its insight that states in anarchy fear for their survival as independent actors. According to realists, states

\textsuperscript{322} Martin 1993.
\textsuperscript{323} Raustiala and Victor 2004.
\textsuperscript{324} Oneal and Russett 1999; Xiang, Xu, and Keteku 2007.
\textsuperscript{325} Polacheck and Xiang 2010.
worry that today’s friend may be tomorrow’s enemy in war, and fear that achievement of joint gains that advantage a friend in the present might produce a more dangerous potential foe in the future. As a result, states must give serious attention to the gains of partners.”

This expectation was neatly captured by Joseph Grieco’s $k$-factor, defined as “the state’s sensitivity to gaps in payoffs,” which is based on uncertainty and the ever present possibility of war under anarchy. It flows from Grieco’s argument, however, that when $k$ is low, as it cannot fail to be in a world that has not witnessed a single war among major states since the early 1950s, states have little reasons to worry about the military externalities of economic gains (the so-called ‘relative gains’ problem). In his argument about the transition from balancing systems to concert systems and back, Jervis argues that the expectation that war is a normal, expected practice in the relations among states is a key assumption of the balance of power. Without this expectation, coordination in Concert can stabilize and status quo states can afford not to think from the balance of power but from multilateralism.

The decline of war and the increase of cooperation and organization are probably mutually reinforcing. Among states, cooperation has become the expected behavior and conflict, and war in particular, the exception. As the specter of inter-state war is receding into the background, cooperation faces fewer difficulties, and as cooperation and integration continue to grow, the opportunity

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328 Jervis 1985; Pouliot 2016.
cost of war becomes correspondingly greater, providing additional disincentives to the unilateral resort to force.

_The displacement of selection pressures to the system-level_

In a de-Darwinizing system, as the relations among lower-level individuals become increasingly cooperative, the system as a whole increasingly becomes the object of selection pressures from the external environment. A number of considerations suggest that Darwinian selection pressures have shifted upward, from individual states to the collectivity of states as a whole.

First, in the contemporary international environment, threats to the survival of individual states are almost non-existent. “Since 1945 very few states have been selected out, despite the existence of microstates whose military and economic viability would have been in doubt in earlier systems.”329 Indeed, the rate of state death since 1648 has been low and steadily declining to the point where, today, it is almost zero.330 As Fazal notes, “violent state death in particular virtually ceases after 1945.”331 Countries like Japan (1945), Germany (1945), Kuwait (1990) and Iraq (2003) have experienced complete military defeat, foreign military occupation, and have since had their full sovereignty restored. This is in sharp contrast to previous centuries, when territorial conquest and state death were almost routine occurrences. While, according to Charles Tilly’s count, there were 500 European states in the 16th century,332 there are about 50 today. The period

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329 Kahler 1997: 45.
332 Tilly 1986.
after 1945, however, exhibits a sharp reversal of this trend. In 1945, there were about 64 states in the international system. Today, there are almost 200. There are only two cases of state deaths since 1945 (South Vietnam and Kuwait, which was reversed) and almost 140 state births.\footnote{Fazal 2007.}

Second, the rarity of state death is probably due not only to the decline of interstate war, but also to the fact that contemporary attempts at territorial conquest do not occur in the same permissive ‘environment’ that characterized previous centuries. Would-be conquerors now have to contend with a strong territorial integrity norm, which emerged after WWI, became widely accepted after WWII and was further institutionalized after 1976.\footnote{Zacher 2001.} Not only is territorial aggression prohibited, but in cases where deterrence fails, territorial gains are generally not recognized by the international community. In the 19th century, it was normal for the victorious side in a war to exploit territorial gains from military victory. So-called ‘rights of conquest’ were generally recognized and territorial adjustment was a common balance-of-power practice.\footnote{Korman 1996; Zacher 2001.} Between WWI and WWII, however, a new rule of ‘nonrecognition of aggressive gain,’ became normal practice.\footnote{O’Mahoney 2012.} Saddam Hussein’s attempt to conquer Kuwait was thus met by an overwhelming coalition authorized by UN Security Council Resolution 668, which fully restored Kuwaiti sovereignty. Following Iraq’s defeat in that war and the complete invasion of its territory twelve years later, its borders were eventually restored in
full. The Republic of South Ossetia’s self-declaration of independence from Georgia, following the Russo-Georgian war of 2008, was only recognized by Russia and a handful of states, and there has been intense opposition to Russia’s behavior in the Ukraine and widespread nonrecognition of its annexation of Crimea in 2014. Given the historical importance of territorial issues in inter-state war, these powerful norms protecting states’ territorial integrity have undoubtedly contributed to the decline of the latter.

Third, not only are states not ‘selected out’ as a result of international systemic pressures, but in many cases, their survival can actually be attributed to the privileges they receive as recognized members of the international system. Many states owe their continued survival not to their ability to ‘help themselves’ in the face of a challenging environment, but to the recognition of their sovereignty and assistance by other states. Indeed, actors that do not enjoy recognition “inhabit a different, more violent and precarious world than system members do.” As Martha Finnemore puts it, “if you are not a state, you are nobody in world politics, and national liberation groups understand this.”

In his study of the expansion of the international system between 1415 and 1987, Strang finds that “while movement from sovereignty to dependency is

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337 Vasquez and Henehan 2011.
338 Fazal and Griffith 2014; Jackson 1993. I am not suggesting that the 'people' living under these states are necessarily better off, but only that membership in the international system improves the prospect for survival of the 'states' themselves. On the inadequacies of existing international assistance regime, see Krasner 2004 and Fearon and Laitin 2004. It is also beyond the scope of this dissertation to engage the question whether this represents a new imperialism. On this question, see Paris 2002.
uncommon, the colonization of unrecognized polities is a fundamental, routine feature of Western political expansion.”342 Since today there is not an area on earth that is not governed by a state or subject to an inter-state treaty, unrecognized entities often take the form of secessionist movements or terrorists organizations challenging existing states. When dealing with violent non-state actors threatening the stability of a member state, the international community “often went beyond acquiescence (with the existing state) to actively providing arms and expertise for the crushing of secessionist movements, so that even obviously dysfunctional states could maintain their territorial integrity.”343

In addition to the protection of their territorial integrity by the international community, failing states can benefit from international assistance, notably in the form of IMF loans and UN aid.344 As Tanisha Fazal and Ryan Griffiths note, “access to the benefits of the global economy turns to a large extent on sovereign recognition.”345 Lacking a postal identity and a recognized central bank constitute important obstacles for non-state actors that can prevent them from getting crucial loans, for instance. This does not mean that unrecognized entities will necessarily do worse than recognized states. Somaliland defies the rule by performing state-like functions much better than the ‘legitimate’ Somalian

342 Strang 1991: 158.
344 Fazal and Griffith 2014.
345 Ibid: 94.
government in the Mogadishu, despite the help the latter (and not the former) has received from the international community.\textsuperscript{346}

These observations nonetheless suggest that we are really in the presence of two environments when we speak about the international system: a state’s life chances differ dramatically depending on whether it is recognized or not, or in other words, whether it lives inside or outside the international system. Internally, the international system, far from exerting Darwinian selection pressures on states, rather provides states with ‘club goods’ – unique rights and privileges, and sometimes assistance – that in many cases enable their continued survival.\textsuperscript{347} The environment that inter-state relations constitute thus appears less like a harsh Darwinian environment, where only the fittest survive, and more like the buffered and relatively safe, ‘warm and wet’ internal environment of an organism.

Meanwhile, contemporary security threats are increasingly seen as coming, not from other states, but from the actors and phenomena in the external environment of the international system and framed as threats to \textit{all} states.\textsuperscript{348} As Fearon and Laitin note, states no longer constitute primary security threats to each other. Rather, states increasingly worry about insecurity “externalities” that arise “from the combination of the scientific revolution and political disorder, economic collapse, and anger in the third world” which “include risks of

\textsuperscript{346} Herbst 1996-97: 138.
\textsuperscript{347} On club goods, see Buchanan 1965.
\textsuperscript{348} Buzan and Waever 2009 propose the concept of ‘macrosecuritization’ to capture this phenomenon.
catastrophic terrorism using (weapons of mass destruction), refugee flows, health threats, enhanced drug smuggling networks, and disruption of oil supplies” as well as the “destabilizing consequences of protracted civil wars for whole regions.”

No clearer take on the perception of group-level selection pressures on the international system can be found than former Secretary General of the UN, Kofi Annan’s perspective on contemporary threats:

“The starting point for a new consensus should be a broad view of today's threats. These dangers include not just international wars but also civil violence, organized crime, terrorism, and weapons of mass destruction. They also include poverty, infectious disease, and environmental degradation, since these ills can also have catastrophic consequences and wreak tremendous damage. All of these can undermine states as the basic units of the international system.”

Indeed, states increasingly treat security as a “collective action problem.” The UN High-Level Panel on Threats (2004) concluded that “today, more than ever before, threats are interrelated and a threat to one is a threat to all. The mutual vulnerability of weak and strong has never been clearer” and that “no State, no matter how powerful, can by its own efforts alone make itself invulnerable to today’s threats. Every State requires the cooperation of other States to make itself secure.” While the Panel notes that the threat of inter-state war has not completely receded, the report puts a clear emphasis on threats in the ‘environment’ of the system: poverty, infectious diseases and environmental

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degradation, civil conflict, the potential acquisition and use of nuclear, radiological, chemical or bacteriological weapons by terrorists.353 The shift from state-based threats to threatening actors and phenomena in the system’s external environment is particularly clear in the discourse about the nature of the nuclear threat, where nuclear terrorism has replaced nuclear war as the primary concern of states. In his Prague speech (2009), US President Barak Obama identified the threat of nuclear terrorism as “the most immediate and extreme threat to global security.”354 And indeed, the Washington (2010), Seoul (2012) and Hague (2014) Nuclear Security Summits and the growing infrastructure to monitor and prevent nuclear materials from falling in the hands of threatening individuals and groups demonstrate a growing consensus among state leaders around the world that nuclear terrorism constitutes a serious security threat to all states.355

To summarize, the previous discussion has described two simultaneous developments that are consistent with a METI. At the level of inter-state relations, we observe an increasingly benign internal, inter-national environment that is the product of the simultaneous decrease in violent inter-state conflict and increase in inter-state cooperation, organization and integration. At the higher level of the international system and its own environment, we observe an increasingly ‘securitized’ relationship between the international system and a number of non-state actors (e.g. terrorists) and phenomena (e.g. diseases and

353 Ibid.
354 White House 2009.
355 Bunn et al. 2013.
climate change). This suggests that while the internal dynamics of the international system are de-Darwinizing, the external dynamics of the international system and its own environment are becoming the locus of Darwinian selection.

**Implications and conclusion**

To conclude this chapter I want to discuss a number of important implications of the METI hypothesis. First, it signifies that the assumption that Darwinism legitimates the Realist perspective on international politics is unfounded and that the latest Darwinian evolutionary thinking is consistent with international political phenomena typically associated with Liberalism and Constructivism. In this context, turning to Lamarck appears unnecessary and, given Lamarck’s status, represents a potentially self-defeating strategy from a critical perspective. Liberals and Constructivists would gain from familiarizing themselves with the latest developments in evolutionary biology and METI theory in particular.

Second, the METI hypothesis leads us to expect qualitatively different relations among states. If the international system is a de-Darwinizing environment, interstate relations will increasingly resemble the warm, wet and regulated internal dynamics of an organism, shielded from the harsh external environment by the boundaries that the latter provides. Multilateral action will be the expected pattern of behavior among states and the study of collective security dynamics will shift from a strict focus to the management of rogue states within to include

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356 Buzan et al. 1998.
the management of threats and risks in the environment of the system. This has an important implication for structural theory and analysis, namely that the interests of individual states will increasingly be determined, not only by their position relative to each other, but also largely and primarily by the position of the international system itself relative to its own environment. This suggests a whole new ‘theory of international politics’ and I will lay the bases for such a structural theory in the next two chapters.

Third, it suggests that traditional Darwinian frameworks for understanding international system change have become somewhat obsolete. If the international system is becoming an individual, a ‘developmental’ perspective on its contemporary transformation will eventually become necessary to complement to existing ‘evolutionary’ accounts of its historical origins and transformations, including the one presented in this chapter. In IR, we typically do not distinguish evolution and development, and often conflate the two, sometimes in the same breath, as synonyms for change. For biologists, however, evolution and development refer to very different units of analysis and mechanisms of change. Evolution is about change in populations through differential turnover in the individuals that compose them. Development is about change in individuals over their lifecycle. If the international system is an individual, a developmental perspective on its transformation becomes necessary. Thinking developmentally about change in an individual, however, involves a distinct set of concepts,

358 The exception is Alex Wendt’s world state argument which briefly alludes to development as a distinct perspective on change; see Wendt 2003.
mechanisms and theories that have yet to be articulated in an IR context.\textsuperscript{359} I flesh out a developmental perspective on the transformation of the international system and contrast it with evolutionary perspectives in chapters 5 and 6.

Fourth, this should have important implications for global governance. If the international system is an individual superorganism, we can expect it to have greater control over its environment, and by extension, to be particularly ‘resilient.’\textsuperscript{360} Organisms, being entropy-deflecting machines, are notoriously resilient systems, and superorganisms, like insect colonies, are among the most ecologically successful forms of biological organization. One way organisms deflect entropy is by creating and managing their environment.\textsuperscript{361} This can explain the ecological success of the sovereign state systemic form of political organization, which has expanded to span the entire globe since 1945, and suggests that this form of global political organization is here to stay and that it will be difficult to change. Schweller’s expectation that international politics will descend down a path of entropy might very well be correct in the very long run, but if the international system is superorganism, this could retard the process significantly.\textsuperscript{362}

Finally, it is important to keep in mind that METIs describe a process, a \textit{movement} towards individuality; METIs are always incomplete and always constitute work-in-progress. While challenges from rogue elements can lead to

\textsuperscript{359} A good introduction to some of these issues can be found in Oyama et al. 2003.
\textsuperscript{360} Brassett et al. 2013.
\textsuperscript{361} Lewontin 2000.
\textsuperscript{362} Schweller 2014.
adaptations that will strengthen the emerging individual, they can also undermine it. At the moment of writing this dissertation, the Iran Nuclear Deal appears to be a step forward, but in the meantime, a number of observers fear that Russia and NATO are engaged in a risky rivalry that significantly increases the probability of war. How persistent will the international system superorganism be in the face of such challenges?

To address this last question, however, we need to investigate the organization and structure of the emerging individual and their role in furthering the de-Darwinization of the individual’s internal environment, not only from a macro, evolutionary perspective, as I have done here, but also from a more micro, physiological and developmental one. This is my objective in the next two chapters. In chapters 3 and 4, I will offer a physiological description of the international system individual. I will describe how the international system maintains the de-Darwinization of its internal relations in the face of environmental challenges. To do so, I will describe the organization and structure of the international system through the perspective of self-producing (or autopoietic) systems. In chapters 5 and 6, I will offer a developmental description of the international system. I will describe how the international system individual will transform itself over time, in order to maintain its individuality.

The argument I have made in this chapter gave us some insights about why the international system appears to be on tracks to individuality. The physiological perspective of chapters 3 and 4 will complement this picture by addressing how
the international system individual maintains itself on the tracks to individuality. And finally, the developmental argument presented in chapters 5 and 6 will bring us back to our original concern with the future of the international system in the globalization era by telling us what directions the individuality tracks will take the international system to.
Part B

Organization and Structure

Introduction

In the previous chapter, I have argued that a number of mutually reinforcing and increasingly well-documented international political trends suggest that, from a METI perspective, the international system in the process of becoming an individual in its own right. The structure is becoming an agent.

If the international system is indeed an emerging individual, this begs a number of important questions. What kind of individual/agent is the international system becoming? How confident can we be that the new individual will not fall prey to Darwinian pressures within and without? What mechanisms will maintain the de-Darwinization of the system’s internal relations past the initial set of environmental conditions that made the METI possible? In other words, how do we know the international system will not fall off the tracks to individuality? These questions are the domain of physiological perspectives. A physiological
perspective examines how the particular organization and structure of living beings enables them to persist over time.

In the following two chapters, I will explore the suggestion I made in chapter 2 that the emerging international system individual is a superorganism. There I have defined superorganisms as collections of organisms that, together, exhibit the functional organization of single organisms and are the object of natural selection pressures. In order to survive, a superorganism must gain the ability to suppress Darwinian dynamics within and without to maintain the integrity of the whole in the face of environment changes.

In these chapters my objective is to convey that the international system superorganism is plausible by offering a redescription of the organization of the international system superorganism, using concepts and principles from general systems theory, and more specifically, the theory of self-producing (or autopoietic) systems. According to this theory, which I will outline in chapter 3, organisms’ remarkable ability to persist in the face of thermodynamic decay and other environmental perturbations comes from their organization as self-producing systems, that is, as closed networks in which components and processes jointly (re)produce both the network and themselves. It is their self-producing organization that renders organizations autonomous vis-à-vis their environment and enables them to persist across environmental contexts.

In chapter 4, I will then apply the theory of self-producing systems to the case of the international system. The plausibility of the argument I will present in that
chapter should be evaluated on the basis of its ability to further subsume diverse international political phenomena under a single structural logic. Because it is made possible and necessary by the METI working hypothesis, the successful redescription of the international system as a self-producing system should also increase our confidence in the arguments I have made in chapter 2. Indeed, before moving forward, it is important to point out that, while they answer different questions, about different time frames, the evolutionary story of chapter 2 and the physiological story that I will tell in the next two chapters ultimately amount to two sides of a continuous process. The next chapters add another layer in the problematizing redescription of the contemporary international system that I have begun in the previous chapter. Chapter 2 described how the international system was put on tracks leading it towards greater individuality. The physiological story I develop in the next two chapters will describe how the new international system individual is organized to maintain itself on those tracks.

**Preview of the argument**

To begin, let me clarify that I am not saying the international system is becoming a world state (or a single organism). This would undoubtedly be an overstatement, at this point. Indeed, as I will later suggest, the argument that states themselves are organism-like remains highly persuasive, and I am not

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363 See Timbergen 1963
364 If this even means anything in light of the symbiotic revolution.
suggesting that the international system possesses a greater degree of organization and integration than the most capable states in the system. Indeed, while the world state idea was the rage in the early stages of the Cold War, today it is difficult to find anyone ready to argue that the world state is upon us.\textsuperscript{365} In the nearest sympathetic estimate, it is 100-200 years away.\textsuperscript{366}

My argument is that the contemporary international system is more plausibly compared to a superorganism, a cooperative whole organized for collective defense in the manner of an insect colony, than to the kind of competitive Darwinian environment we typically believe the system to be. While this is a more permissive category than the world state, it nonetheless thoroughly challenges how we typically think about the international system. Before I begin introducing physiological perspectives and the theory of self-producing systems, let me summarize these challenges to IR theory.

\textit{Hierarchy before anarchy}

The redescription of the international system as a superorganism challenges the core of the anarchy problematic, which as I have suggested in the introduction, still frames how most IR scholars think about the international system. I will argue that viewing the international system as a self-producing system enables us to see how the fundamental organizing principle of the international system is not primarily anarchic but hierarchic. I will argue that another ordering principle – stratification – accounts for both the anarchy of inter-state relations and the

\textsuperscript{365} Deudney 2007. \\
\textsuperscript{366} Wendt 2003.
hierarchy between states and non-state actors. In the stratified structure of global politics, international anarchy sits atop a more fundamental hierarchy built on the distinction between sovereign states and non-sovereign actors, and formal equality at the top is made possible by the structure of privileges that excludes other actors at the bottom.

The stratification of global politics is the product of the international system’s genuine ordering principle: the self-producing organization of international sovereignty. States constitute a closed network of self-production (the international system) where components (states) and processes (international practices) jointly produce (through exclusive, mutual recognition) those self-same components (states) and processes (international practices), thus establishing an autonomous, self-producing entity.

I will propose that we should understand state sovereignty, not only as a private monopoly each state has over its territory, but as a shared monopoly over metapolitical authority that increasingly requires states’ collusion for its production. The production of this shared monopoly over metapolitical authority is becoming increasingly international. Sovereign power is not a private property of individual states but a collective achievement of the international system. The international system is not a competitive market, as Waltz argued, but a cartel, colluding in the way that enhances its control over the environment. The production of state authority and privileges, born out of the double standard produced by exclusionary mutual recognition practices (hierarchy), increases the gains from
collusion and makes it possible for states to maintain formal equality among them (anarchy).

*From the Third to the Fourth Image*

Viewing the international system as a superorganism shifts our attention from the Third Image of international politics – the state and inter-state relations in the context of the anarchic international environment – to a Fourth Image built on the distinction between the international system and *its own* environment. While most of what has been written in IR concerns inter-state relations under conditions of anarchy, less has been written about the relationship between the international system and the actors and phenomena in its environment, and even less attention has been paid to how the international system’s organization and structure produce boundaries that insulate inter-state relations from the system’s environment.

Yet, the dynamic interactions between the international system and its environment have powerful constitutive effects on the international system, states and international relations. As Waltz was fond of saying, structural analysis can tell us “a small number of big and important things,” notably about the interests of individual states. In the influential anarchy problematic that he helped frame, states’ interest in survival in an uncertain, anarchic environment made them, like individual organisms struggling to survive in Darwinian environments, *essentially* selfish. On this point, Wendt agreed and when defining

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367 Waltz 1959.
368 Waltz 1986: 329.
the ‘essential state’, suggested that at the level of their corporate interests, “states are predisposed to define their objective interests in self-interested terms.”

However, if, as I will argue, the anarchic, horizontal relations of formal equality among states constitute the privileged apex of a more fundamentally stratified structure based on relations of sovereign inequality and this stratified structure requires collusion on the part of this privileged class for its reproduction, then we need to correspondingly rethink our conception of the essential state’s corporate interests. In addition to the self-interested nature that comes from their constitution as self-organized entities, we need to make space for a deep shared interest in the preservation of the hierarchical structure that constitutes their privileged position in world politics (belonging to the international superorganism).

As I will later suggest, the structural redescription of the international system that I propose mirrors the shift in perspective on feudalism that occurs once we expand our focus beyond the relations among the warrior aristocracy and take into account the more fundamental domination of the nobility over the peasantry. Without this more encompassing view of feudal structure, we risk limiting ourselves to relations of apparent rivalry within the warrior class and overlooking the deep solidarity that class shares in the maintenance of its class domination. Similarly, we risk overemphasizing inter-state rivalry and

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370 This was essentially Marc Bloch’s (2014) critique of François-Louis Ganshof’s (1964) horizontal view of feudalism. See my discussion on pp.220-222.
overlooking the deep solidarity among states over issues that threaten the social organization of their global political supremacy.

*Understanding systems change*

Finally, the argument I will present in this chapter will provide the theoretical foundation that will allow us to challenge existing Darwinian evolutionary accounts of the origins and transformation of the international system in Part C. Once we buy the hypothesis that the international system is an emerging, individual superorganism, if we want to grasp its contemporary and future transformations we will need a developmental perspective to complement the METI and physiological arguments that took us there. The physiological argument that I make in this chapter, however, is a necessary prerequisite to the elaboration of the developmental perspective of chapter 6. Indeed, it will allow us to reconceptualize Gilpin’s concept of “systems change”371 as changes in the system’s *structure* in response to environmental challenges to its self-producing *organization*, whose primary function, the physiological perspective I outline in chapter 3 will tell us, is to make it possible for this same organization to *persist*. Theorizing the international system as a self-producing system thus enables us to account for structural change within the system (systemic change) and change of systems (or systems change). We can do so through a *developmental perspective* in which changes to the structure in a system are either consistent with the reproduction of the system’s self-producing organization, thus leading to the

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further development of the system (systemic change), or inconsistent with self-
production, thus leading to the disintegration of the system (systems change).

Outline of chapters 3 and 4

The next two chapters are organized as follows. In chapter 3, I introduce the
physiological perspective, the theory of self-producing systems, which I will apply
to the case of the international system in the next chapter. In the first section of
the chapter, I discuss what a physiological perspective on the emerging
international system superorganism entails. In the second section, I introduce
the logic of self-producing (or autopoietic) systems, its key concepts of
organization and structure, and the principles of organizational closure and
structural determinism. In the third section, I return to the idea that the
emergence of the superorganisms organization goes hand in hand with the de-
Darwinization of the relations among its constituents. I discuss three key de-
Darwinization mechanisms – cognition, reproduction and immunity – from the
perspective of the theory of self-producing systems.

In chapter 4, I apply the theory of self-producing systems to the case of the
international system. In the first section, I argue that state sovereignty is
autopoietic and that the production of state sovereignty is increasingly located at
the level of the international system. Having established that sovereignty is
autopoietic at the system level, I proceed in the next section to describe the
organization and structure of the international superorganism, as well as its dynamics of organizational closure and structural determinism. I conclude the chapter with a discussion of the emergence of system cognition, reproduction and immunity in the international system and locate, in Darwinian space, different critical moments in the history of the international system.
In this chapter, I introduce a physiological perspective, the theory of self-producing systems, which I will apply, in the next chapter, to the case of the international system.

**Physiological perspectives and processualism**

A physiological perspective highlights how an individual’s organization enables its individuality to persist over time. It takes as its starting point a processual ontology in which the world is viewed as continuously changing. Rather than portraying the world as made up of preexisting substances and entities, it is seen as made up of processes and relations.\(^{372}\) A physiological perspective, then, highlights how organisms are able to maintain their cohesion despite needing to perpetually remake themselves in the face of adverse processes. This problem is illustrated by Plutarch’s “Ship of Theseus” problem: can we speak of the same

ship if we have replaced all of a ship’s components, planks, nails, rudder, sail and the rest, with new ones? How can we discern the continuous existence of an individual as its components come and go? A physiological perspective emphasizes the organization of the living as the source of their ability to maintain their identity over time in the face of changing environments and through turnover of their constituent materials.

The processual ontology that underpins a physiological perspective on the organism goes a long way in addressing some of Iver Neumann’s objections to the use of organism concepts to describe the state. Neumann’s resistance to the concept of organism comes from the widespread belief that biologists see organisms as unproblematic substances or entities. Organisms are often seen as sturdy entities whose persistence is assumed. As far as a physiological perspective is concerned, however, persistence is the central explanatory problem. A physiological perspective actually holds much critical potential, even as it portrays a world of fundamentally conservative systems exploiting the resources from and adapting to their environment for the sake of their own self-(re)production. This critical potential will become clearer later on, when I begin describing the double standards that the international system produces to perpetuate its monopoly over global metapolitical authority.

373 Neumann 2004.
Superorganisms and the problem of the paradigm

My argument is that the international system is becoming a superorganism. Following Sober and Wilson, in chapter 2 I have defined a superorganism as, on the one hand, an object of natural selection pressures, and on the other, as a collection of organisms that possesses the functional organization of single organisms. While an evolutionary perspective on the superorganism like the METI perspective of chapter 2 focuses on the first characteristic, the level at which natural selection processes operate, a physiological perspective focuses on the second characteristic, the functional organization of the superorganism.

A problem that immediately arises once we take a physiological perspective on the superorganism is the ‘problem of the paradigm.’ If a superorganism is organized like a single organism, to what single organism is the functional organization of the superorganism actually analogous to? Organisms, from eukaryotes to chimpanzees and even trees, let alone cases like Pando, the forest that is actually a tree, differ widely. We should therefore be careful not to cast any particular form of organism as paradigmatic of organismality in general, as we have a tendency to do when we equate organisms with better-known vertebrates. Questions such as “What is the lung of the international system?,” or other similar questions, can be quite misleading.

375 Haber 2013.
376 See discussion in ch.2, pp.79-81.
The first question we should be asking is whether there are aspects of organization that are common to all life forms. Most importantly, are these common characteristics useful in understanding key dynamics of the superorganism that interests us? A common approach to defining organisms is to identify the characteristics that distinguish the living from machines. One then compares the candidate (super)organism to these characteristics. This is the approach Wendt takes in “The State as Person,” the most focused and comprehensive existing treatment of the question of organismality in an IR context. In this piece, Wendt suggests that superorganisms share four central characteristics with organisms - they are individuals, they are homeostatic wholes, they exhibit autopoietic organization, and they are autonomous – and one difference – they do not reproduce (at least not sexually).

These characteristics of (super)organisms (individuality, homeostasis, autopoiesis, and autonomy) can be encapsulated into one fundamental principle: their self-producing (or autopoietic) organization. The autopoietic organization of living beings is what distinguishes them from machines. While both machines and organisms are characterized by their functional organization, this functionality is differently oriented. Machines are other-producing or ‘allopoietic’ systems: they are produced by and produce for another system. Organisms are self-producing or ‘autopoietic’ systems (auto=self, poesis=production): they produce themselves, for their own sake, by maintaining their autonomy from

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377 This is the approach Wendt takes in Wendt 2004.
378 Wendt 2004; he borrows his criteria from Ruiz-Mirazo et al. 2000.
their environment by converting environmental resources via metabolic and immune processes.\textsuperscript{379}

The self-producing nature of organisms captures the other three characteristics of organisms in Wendt's conceptualization. The concept of autopoiesis captures the recursive relationship between an organism's organization, boundary reproduction, and environment. The organization of self-producing systems, directed towards their self-production (and the reproduction of self-production) produces a boundary that \textit{individuates} the system vis-à-vis its environment and gives it \textit{autonomy} in how it responds to the environment. \textit{Homeostasis}, the control of the system's boundaries so as to maintain its internal environment within certain bounds despite variation in its external environment, is only one aspect of an organism's self-production activities.

For a number of reasons, an emphasis on the logic of self-producing systems offers an ideal solution to the problem of the paradigm. First, all living systems are self-producing systems, since autopoietic organization is both a necessary and sufficient condition for life.\textsuperscript{380} The theory of self-producing systems was originally developed as a minimalist theory of life, in which life is understood as the product of a certain kind of organization. Emphasizing the aspect of organization that is common to all living organisms eliminates the problem of the paradigm.

\textsuperscript{379} For a recent discussion, see Nicholson 2013; also see Symons 2010.
\textsuperscript{380} Maturana 2002: 8.
Autopoiesis also offers a solution to a second problem: how can we transfer knowledge about biological systems to the case of a social system like the international system? There again, the theory of self-producing systems is general enough to cross that bridge. First, as a ‘general systems’ theory, the logic of self-producing systems is less dependent on the traditional biological-organism context and more readily applicable to the case of the international system than other similar biological approaches.\textsuperscript{381}

Second, in contrast with the popular idea that what makes an entity ‘living’ is the biotic nature of the materials that compose it, the theory of self-producing systems emphasizes the organization of the living as the primary characteristic of all life, and thus to expand our understanding of what can be considered ‘living.’ As Maturana puts it, “it is not the molecules that compose a living system that make it a living system.”\textsuperscript{382} Indeed, as the case of termite \textit{Macrotermes} colonies will illustrate nicely, some living beings are made up to a large extent of non-living components that are nonetheless central to their living operations. In this particular case it is the mound that the termites build, an intricate pile of dirt that works as a lung for the whole symbiotic superorganism. As long as it can be shown that the whole exhibits autopoietic organization, thus, this should preclude ruling out the case of the international system, which is, like the state, a structure of ideas anchored in human brains.\textsuperscript{383}

\textsuperscript{381} Mingers 2002, 2004.
\textsuperscript{382} Maturana 2002: 10.
\textsuperscript{383} For a discussion of the physics that underpin social structures, see Wendt 2015.
Finally, the autopoietic concepts of organization and structure, and its principles of organizational closure and structural determinism, have already been usefully applied in social contexts. Indeed, the theory of self-producing systems is already well-developed in the context of legal studies, so much that autopoiesis has come to be seen as ‘the’ theory of the law – “only laws make laws”. The theory is also central to the social communication theory of Niklas Luhmann, which has begun to attract some attention in IR. And as I will discuss shortly, Wendt has already made a persuasive case that individual states are autopoietic systems. A priori, then, there is no reason why a ‘social’ system like the international system could not be analyzed through the logic of self-producing system.

**Self-producing systems**

While the theory of self-producing systems was originally formulated by Chilean biologists Humberto Maturana and Francisco Varela in the 1970s to describe the workings of the biological cell, it has later been reworked as a general systems theory in order to explain the workings of other similar systems in the natural and social sciences. Despite its influence in other social sciences, autopoiesis has received surprisingly little attention in IR, except in research inspired by

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384 Teubner 1993; Mingers 1995.  
385 Luhmann 1995. For an attempt to make Luhmann more accessible, see Moeller 2005. A discussion of the purchase of Luhmann’s social systems approach can be found in Albert, Cederman and Wendt 2010.  
386 Wendt 2004.  
Luhmann’s social systems approach, which has borrowed extensively but very selectively from the theory.\textsuperscript{388}

\textit{Closed networks of self-production}

In a nutshell, self-producing systems are characterized by the circular organization of their metabolism, which makes them largely autonomous from their environment. Autopoiesis emphasizes how an organism’s inner organization and processes jointly (re)produce boundaries that mediate and regulate the interaction between the organism and its environment, giving the organism more autonomy vis-à-vis its environment and in the process, as I will discuss in greater detail in Part C, realizing its development.

Varela offers the following formal definition: “An autopoietic system is organized (defined as unity) as a network of processes of production (synthesis and destruction) of components such that these components: (1) continuously regenerate and realize the network that produces them, and (2) constitute the system as a distinguishable unity in the domain in which they exist.”\textsuperscript{389} The circular logic of self-producing organization makes autopoietic systems largely autonomous from their environment: “components and processes jointly produce those selfsame components and processes, thus establishing an autonomous,

\textsuperscript{388} Luhmann 1995.
\textsuperscript{389} Varela 1997.
self-producing entity.” Figure 3.1 below illustrates the circular logic of these closed networks of self-production.

What distinguishes autopoietic systems from other types of systems? Autopoietic systems can be contrasted with allopoietic systems, which are other-producing. An example of allopoietic system is a factory, where inputs (labor and capital) are transformed to produce outputs (cars, radios, toys, etc.). While the latter can be characterized in terms of inputs and outputs, being self-produced, the former’s main ‘output’ is itself. Organisms, thus, metabolically convert the resources from their environment into themselves. You are what you eat.

All systems, not only self-producing systems, owe their existence to a boundary that individuates them against the background of their environment. This is an important distinction between system and environment that is central to systems theory but that has been largely lost in IR, where the international system itself is deemed to be equivalent to its environment. The main distinguishing characteristic of autopoietic systems, at the level of the system-environment distinction, is that their boundary is primarily (re)produced endogenously, through the ‘preferential interactions’ of the system’s components. We can contrast this process with the boundaries of allopoietic systems, which are determined by an external creator who defines their identity, inputs, outputs and mechanisms. Allopoietic systems thus do not have an independent identity.

391 The diagram is inspired by Mingers 1995: 12.
Autopoietic systems, being self-produced, do. What is meant by identity, here, is that the autopoietic system produces a distinct cut on its own environment, a perspective that is defined by the self-production imperative.

![Diagram of Boundary, Components, Processes of production, Internal environment, External environment](image)

**Figure 3.1 – The logic of self-producing systems**

*Organization and structure*

The two key concepts when analyzing the workings of an autopoietic system are organization and structure. A system’s *organization* constitutes the identity of the system. “The organization consists of the relations among components and the necessary properties of the components that characterize or define the unity in general as belonging to a particular type or class. This determines its
properties as a whole.” This organization is formal and abstract, not a concrete realization. The concept of organization enables us to identify a system as the same system over time, even in cases where there is complete turnover in its components (recall the Ship of Theseus problem). The human cells and bacteria that form an individual human organism, for example, undergo a virtually complete turnover in the course of the individual’s lifecycle, and yet we have no problem referring to this individual as the same over the course of her life.

The fundamental aspect about the organization of autopoietic systems is the organization of self-production. All autopoietic systems are circular networks of self-production, but how self-production is organized will differ from one system to another. Despite the fact that they are both self-produced systems, the organization of self-production in a human being differs significantly from the organization of self-production in a termite colony (let alone from the organization of a social system like the international system). The first task, when describing a self-producing system, is to specify how self-production is organized. In the case of the international system, I will argue that it is international sovereignty, via international practices, that constitutes the self-producing organization of the international system.

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393 Ibid: 14.
394 While all living system are autopoietic, there is an expanding literature on the autopoietic organization of social systems. In the next section, I argue that sovereignty is autopoietic and outline how sovereignty produces itself.
The other key concept is that of *structure*. Self-producing systems are “*constituted* by an organization and *realized* in a structure.” The structure of an autopoietic system gives its autopoietic organization a concrete (as opposed to simply a formal) existence. It is thus through its structure at any given time that a given system interacts with its environment. To avoid conceptual confusion, it is important to note how the theory’s concept of structure differs from the way we are accustomed to think about structure in IR. “Generally,” John Mingers notes, “in the description of a system, structure is contrasted with process to refer to those parts of the system which change only slowly; structure and organization would be almost interchangeable…. The distinction between structure and organization (in the theory of self-producing systems) is between the reality of an actual example and the abstract generality lying behind all such examples.”

A system’s formal organization is, at any given time, realized in a concrete structure. An organization is thus generally multiply realizable at the level of structure, which enables the system to accommodate structural changes over time without losing its identity.

Given that we are accustomed to think about structure as organization and vice-versa, there is a risk of confusion in introducing a distinction between the two. However, the distinction, it turns out, is a very useful one. Indeed, distinguishing between formal organization and concrete structure offers a solution to the problem of identity and change that is at the heart of the Ship of Theseus problem and, I will argue in chapter 6, the puzzle of sovereignty’s conservative bias. How

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can a composite entity (in this case a ship) be said to be the same even as there is complete turnover in its components (as we replace all of the ship’s planks)? Distinguishing between changes at the level of organization and changes at the level of structure offers a solution. If the change is at the level of organization, the system’s identity changes and it becomes an entity of a different kind. But because any given organization can be realized through a range of different structures, a system can maintain its identity even as it transforms itself. Thus, most self-producing systems will allow a certain range of structural states to realize their organization.397

<table>
<thead>
<tr>
<th>Table 3.1 - Organization and structure in the logic of self-producing systems</th>
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<tbody>
<tr>
<td><strong>Organization</strong></td>
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<td>Formal</td>
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<td>Conservation</td>
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<td>Multiply realizable</td>
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397 Ibid: xx.
As a cursory look at any family photo album quickly reminds us, human beings go through several structural states throughout their lifecycle, from infancy to old age, but their organization as a human organism remains the same as long as these changes in structure remain within the range of permissible transformations (i.e. as long as they do not kill the person). Similarly, a ship can remain the same ship, even if we change all of its parts.398

*Organizational closure and structural determinism*

Organization and structure are somewhat static concept. In order to understand how self-producing systems maintain their organization over time in the face of challenges from their environment, we need to add two dynamic principles, organizational closure and structural determinism. The first principle, is *organizational closure*, stipulates that “all possible states of activity must always lead to or generate further activity within itself.”399 In other words, autopoietic systems are biased towards the continuation of their self-production processes, which is a technical way of saying that self-producing systems seek to survive since life is defined as the continuation of self-production. This fundamental purpose of the system produces its unique perspective on its environment. Autopoietic systems are continuously representing the entities, actors and processes in its environment as potentially enhancing self-production or as deleterious to it.

398 While useful at illustrating the distinction between organization and structure, a ship is not a self-producing system, so the illustration ends here.
399 Ibid: 32.
Self-producing systems can change in one of two ways in the face of an environmental stimulus: they can undergo changes in their structure that enable their self-production to continue (in which case they survive and even develop) or they can undergo structural changes that undermine their ability to self-produce (in which case they degenerate, a process that ultimately ends with disintegration and death). Self-producing systems are organizationally biased towards the first possibility and will respond to environmental changes by selecting adaptations that enable the continuation of self-production. Development, the process that will be the topic of Part C, is at its core a conservative process.

The second principle is *structural determinism*. Changes in autopoietic systems are determined by the state of the system’s structure, not by the environment of the system. “Everything that happens in it or to it happens in each moment determined by its structure at that moment. That is, nothing external to a living system can specify what happens in it; all that an observer sees as external to a living system can only trigger in it structural changes that are determined in it.”\(^{400}\) This works in two ways. On the one hand, it is the structure of an autopoietic system which determines what environmental changes necessitate adaptive or compensatory structural changes. On the other, the structure determines what changes in the structure are feasible, given the necessity to maintain self-production. Maturana offers useful illustrations:

“What does or does not affect the organism and the nature of any effect is determined by its structure. Humans have receptors for
light and color and so can be triggered by it, while bats can receive high-pitched sounds that humans cannot hear. Each organism has its particular domain of interactions that can affect it and those which cannot. The effects are also structure-determined. Berries that are poisonous to humans are food for other animals; carbon dioxide is necessary for plants but inimical to humans, while oxygen is the opposite. In each case, the nature of the effect of a particular substance is determined not by the substance but by the organism.”

Whether or not a given system can undergo changes without undermining its fundamental organization depends on the plasticity of the system’s structure, that is, on the range of transformations the structure can undergo without compromising the organization of the system. “An autopoietic system has a domain in which it can compensate for perturbations through the realization of its autopoiesis, and in this domain it remains a unity.” We can thus think of plasticity of a system as its transformative potential, a concept that will be at the core of the developmental approach to international system transformation that I will propose in the next chapter.

The system and its environment(s)

Self-producing systems transform their structure in complex interaction with their environment. But what do we mean by the environment of an autopoietic system? The distinction between system and environment in the theory of self-

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402 Another term for this concept which is often used in biology is the concept of ‘norm of reaction.’ See Lewontin 2000.
403 Varela, Maturana and Uribe 1974: 8.
producing systems produces three concepts of environment: an operational or external environment, a cognitive environment, and an internal environment.404

The operational/external environment of the system consists in all phenomena lying outside of the system’s network of self-production and that exist independently of the system’s knowledge. The operational environment has an objective existence; it would be there even if the system did not exist or know it. If a tree falls and no one is there to hear it, does it make a sound? If we are talking about the operational environment, the answer is yes. The task of producing an exhaustive list of the phenomena that belong to a system’s operational environment is futile because they are potentially infinite – gravity, thermodynamic decay, the amount of sunlight, the humidity and pressure of the ambient air, the presence of other living systems, etc.

The cognitive environment of the system is the environment as the system represents it, which will not necessarily correspond to the way an external observer would represent it. Self-producing systems are ‘complex adaptive systems’ that are constantly engaged in the process of knowing their operational environment, forming representations and models of the entities and processes that can potentially help or hurt their ability to self-produce.405 The cognitive environment of the system is constructed by the system and for the system. Through this process, the system develops a subjective perspective on its

404 This distinction between internal and external environments is similar to the distinction Harold and Margaret Sprout made between ‘psycho-milieu’ and the ‘operational environments.’ Sprout and Sprout 1965.

The cognitive environment consists in the various elements of the operational environment that are meaningful to the system in light of the principles of organizational closure and structural determinism, that is, in light of survival and the system’s ability to change states in response to environmental triggers. Meaningful environmental phenomena are therefore those that will require the system to change in order to protect its ability to self-produce. The system’s modification of its structure in response to environmental challenges is thus always mediated by the models that form the system’s cognitive environment.

While I will say a lot more about development in Part C, in the logic of self-producing systems, *development* is understood as the process through which the system learns about its environment and transforms its structure so as to continue self-production within it and, in many cases, gradually gain the ability to manipulate its environment.

To go back to the falling tree illustration: if the tree falls and the system is not there to hear it, it will not register in the system’s cognitive environment. The concept of falling trees and their distinctive sound, however, is likely to have already been represented into the system’s cognitive environment. Given human beings’ relatively fragile structure and depending on their size, falling trees can definitely force changes in a human individual’s structure that would end her autopoiesis. Thus, depending on the degree to which a human individual has

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406 Varela 1997: 78. Varela uses the term “world” to refer to what I call the cognitive environment of the system and uses the term “environment” to refer to the operational environment.
been exposed to an external environment where falling trees are a noticeable occurrence, and on the stage of that individual’s development within that environment, falling trees are likely to have been represented, along with the sound that they make, as a physical threat, and the sound of a falling tree should therefore elicit a corresponding defensive reaction should the system hear it.

Finally, the *internal environment* constitutes the system’s own, organizationally closed, network of components and processes of self-production. It is important to note that from the perspective of the self-producing system itself, this environment is not experienced as an environment but as its ‘Self’. The internal environment of the system, however, is an environment from the perspective of its components. As we will see, even when seen as a self-producing system, the international system is still an environment for individual states, albeit a more benign, organized, and ultimately beneficial one.

To further illustrate the concepts of self-production, organizational closure, structural determinism and cognitive environment, imagine a human organism is offered a bowl of nuts. In the ‘operational environment,’ nuts are simply nuts, with all of their intrinsic characteristics. They are what they are, objectively. In the cognitive environment of the system, however, what nuts are is determined by the human organism, and more specifically, by its need to maintain the self-production network that composes the human organism (organizational closure) and by its particular structure at that time (structural determinism). Concretely, then, for a non-allergic adult, nuts are a potential source of food. But nuts are not
food for everyone; for an allergic adult, they are poison, and for a young child, they can even constitute a choking hazard. Using the same example, we can also think of a case of extended cognition, where one system takes into account a structurally-coupled symbiont in the construction of its own environment, such as the case of a mother who, structurally coupled to her infant, can represent nuts both as a source of food and as a potential choking hazard to her child. To sum up, the meaning of an environment depends on the structure of the system at that time (or of structurally coupled systems), in light of the need to conserve self-production.

De-Darwinization mechanisms

Having defined the logic of self-producing system, we can move down from the general systems' level to their realization in cases of superorganisms. In the previous discussion I have emphasized, from a METI perspective, two essential aspects of superorganisms: functional organization and group-level selection. The two aspects are intimately related. The growing organization of the emerging superorganism is the product of group selection and should further contribute to the de-Darwinization of the superorganism's internal environment. In superorganisms, such as social insect colonies, three key de-Darwinization mechanisms in particular – swarm cognition, immune reaction and socially controlled reproduction – play a key role in the maintenance of the colony’s individuality in the face of challenges within and without. In this section, I
describe each mechanism and the role they play in the maintenance of self-production and individuality. I illustrate each with examples of different cases superorganisms, to continue to drive home the critically important idea that biological individuality comes in unusual shapes and thus continue to widen our imagination when it comes to thinking about the international system.

Swarm cognition

As my discussion of self-producing systems makes clear, cognition is a key individuating mechanism in all organisms. Here I focus on one important aspect of cognition, the emergence in the organism of a subjective perspective on its security environment. Threat cognition, making sense of the external environment in light of the survival requirements of the emerging organization, is an integral part of the development of individuality in a METI. Without it, lower-level entities could not coordinate their activities in the collective defense of the whole.

The neo-Darwinian concept of environmental ‘fitness’ is a misleading one. Traditional evolutionary stories tend to assume that organisms adapt to their environment and that the relationship is strictly determined by the latter. We tend to forget how organisms actually determine the meaning of their environment. The meaning of an environment for an organism is not an ‘objective’ fact to which the organism must adapt but a ‘subjective’ one produced by the organism’s own organization and structure. Environments ‘surround.’

\[407\] On the role of representation of security threats in the construction of the state, see Campbell 1992.
survival requirements of an organism, which can be more generally understood as the maintenance of its network and processes of self-production, determine what aspects of the external world are relevant to it. For instance, what resources constitute food depends on what the organism can digest and metabolize; to bring back my earlier example, nuts are food for some but poison/choking hazards for others.408

In the case of a superorganism, the first step in the development of swarm cognition begins with the sense that the colony exists as a whole that is distinct from its environment. Without at least a partial, rudimentary, and, at a minimum, tacit concept of the system-environment distinction, colony members can only react to their own environment, and not the colony’s environment; the perception of threats by the members of the colony and their coordination in response to the threat would be impossible. If you throw 12 hockey players on the ice with jerseys of the same color, without telling them who they are playing with or against, each player will be forced to play for herself. An example of swarm cognition in a superorganism will further drive the point home.

Macrotermes termite colonies offer a useful illustration of the role of swarm cognition in the development of superindividuation. Macrotermes colonies are constituted by the symbiotic relationship between termites, termitomyces fungi, and a mound. In most termite species, fungi located inside the termites’ digestive tracts are necessary for termites in order to process their woody diet. In the case

408 Lewontin 2000: 64.
of *Macrotermite* termites, however, the digestive fungi are cultivated outside the termites’ digestive tracts. Instead, they are grown inside elaborate structures called ‘fungus combs,’ which are made from wood fibers collected by the termites. These are then digested by fungi that are allowed to grow on them. The whole relationship amounts to a kind of ‘fungus garden.’ Once processed by the fungi, the composted material thus produced can then be eaten by the termites.409

This symbiotic association is not only to the benefit of the termites. Indeed, *termitomyces* fungi have a characteristically slow growth rate. Outside of the sheltered environment of the termite mound, they are soon overtaken by faster-growing, competing species. Shielded from external competition inside the mound, however, they are allowed to grow at their leisurely pace. The association is thus genuinely symbiotic; “both the termites and the fungi depend on each other to survive.”410 The fungi pre-digest wood so that the termites may eat it and metabolize it, and in return the termites build massive mounds and intricate systems of combs that protect their fungi from their competitors.

Termites and fungi are not alone in this symbiotic arrangement. Indeed, for this elaborate symbiotic association to work, the mound itself also plays a necessary role for both termites and fungi. The mound performs two functions for the colony: it shields the fungi from their competitors and it works as a lung that regulates the air quality in the colony’s internal environment. As Turner explains:

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410 Bouchard 2013: 252.
The mound is not a pile of dirt; it is part of the Macrotermes colony ‘extended organism’ and as such is an organ of extended physiology that promotes the colony’s respiratory gas exchange. It does so by capturing transient energy in turbulent wind and channeling it to promote mixing of nest air with mound air, which normally mix only poorly with one another. To perform this function, the mound contains an intricately structured network of tunnels that permeate the mound and ultimately connect the next air space to the mound’s porous surface.”

The mound is made up of inert matter, but in order to perform its lung-like function, it must literally ‘come to life.’ It is in the termite colony’s elaborate organization of mound construction, maintenance and repair that we can best see the colony’s particular brand of distributed cognition at work. Workers are constantly busy (re)building the mound in order to exploit different wind environments and repair damage that threatens its functions. “The mound exhibits structural homeostasis, just as any organ of physiology does: perturb the architecture, and the system responds to restore the architecture to what it was prior to the perturbation.”

This continuous (re)building of the mound is made possible by a “sophisticated form of swarm cognition.” The various, coordinated tasks that constitute the colony’s monitoring of and response to perturbations in its environment are distributed among the members of the colony. When a small group of termites detects a perturbation in the colony’s environment, as a result of damage to the mound, half of the group will head towards the source of the perturbation while

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413 Ibid.
the other half will head deeper inside the mound to warn and mobilize others. Importantly, the collective response of the colony presupposes that each of the millions individual termites that compose the colony has a certain ‘sense’ of the colony as distinct from its environment. The internal environment of the colony (the gas composition of the air and the temperature, for instance) is being constantly monitored, in relation to the external environment, by individual termites. Individually, termites can only have a limited perspective on the colony. Collectively, however, they are able to respond to threats arising anywhere in the environment of the colony. “As individuals, termites have fairly limited cognitive capacities. Swarms have much richer cognitive repertoire, however, because termite swarms inhabit a richer world of cognitive cues and stimuli. From this, the nest, mound, and environment emerge as a complex that is a kind of proto-individual.”414

*The immune system*

A second de-Darwinization mechanism is the immune system, which many biological theorists view as the most important de-Darwinization mechanism, for three reasons.415 First, the immune system plays a key function in the maintenance of the new individual’s boundary with its environment.416 Second, the immune system “exerts its activity everywhere in the organism, ensuring the unity and the cohesiveness of the organism as a whole.”417 And third, all

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415 Michod 1999; Pradeu 2013.
416 Pradeu 2013: 77.
organisms have an immune system, from the simplest cell to the most complex insect colonies, which exhibit ‘social’ immune systems functioning through the collective response of the colony.\textsuperscript{418}

The immune system performs a ‘policing’ function for the emergent individual that complements its cognitive function. The immune system is “one of the main mechanisms by which a higher-level individual ... prevents the emergence of variants having different fitness at a lower-level.”\textsuperscript{419} This policing role has traditionally been interpreted in terms of ‘self-nonself discrimination.’\textsuperscript{420} In this framework, the immune system was seen as watching over genetic identity, which was consistent with the popular idea that a common genetic identity is necessary for the emergence of cooperation at all levels of the biological hierarchy (as in Hamilton’s kin selection argument).\textsuperscript{421} Biologists, however, increasingly see common genetic identity as unnecessary. Indeed, as I have suggested earlier, most apparently genetically homogeneous multicellular organisms are actually genetically-heterogeneous, symbiotic superorganisms; “due to the massive presence of symbionts, every multicellular organism is a chimera.”\textsuperscript{422} If not genetic identity, however, then exactly what kind of ‘program’ does the immune system employ to police the boundaries of a symbiotic individual?

\textsuperscript{418} Cremer et al. 2007.
\textsuperscript{419} Pradeu 2013 : 77.
\textsuperscript{420} Gilbert et al. 2012.
\textsuperscript{421} Hamilton 1964.
\textsuperscript{422} Pradeu 2013: 88.
Recent answers have borrowed from an alternative framework, ‘immune surveillance.’ Rather than strictly watching over the boundary separating the organism from its environment, in this framework the immune system is also watching over the self. More specifically, the immune system looks “for the appearance of tumors, ‘rogue’ cells that replicate and increase their fitness ... at the expense of the whole organism.” The immune surveillance hypothesis suggests that, instead of policing a repertoire of good and bad entities based on their identity, the superorganism’s immune system watches over ‘patterns of pathogenesis’ (or PoPs), types of behavior that are seen as harmful to the superorganism’s organization. Cheaters are identified, not by who they are, but by what they do. In the context of a METI, these can be defined as any kind of behavior that favors the fitness of a lower-level individual at the expense of the fitness of the new higher-level one. From a self-producing systems perspective, PoPs are behaviors that undermine the operation of autopoiesis. As I will discuss shortly, in the beehive case, independent reproduction by the workers constitutes a PoP since it threatens to undermine the cooperation that makes possible the colony’s enhanced capacity to exploit its environment. Immunologists are taking a ‘practice turn.’ The immune system’s role has thus been recast as the production and enforcement of conformity with the rules of behavior that are consistent with the superorganism’s self-production organization and structure.

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423 Burnett 1970.
424 Pradeu 2013, 83.
425 Eberl 2010.
426 On the practice turn in IR, see Adler and Pouliot 2011.
Because of its central role in determining which entities are tolerated or not, the immune system plays a hugely important role in the constitution of the system’s boundary with its environment and, as a result, in the formation of the system’s individuality and identity. This is especially true in cases of symbiotic superorganisms, where the immune system provides a mechanism for the inclusion of outsiders into new symbiotic relationships. In the human organism, the immune system tolerates good bacteria and reacts against bad bacteria. The immune system is also deeply involved in the development of the superorganism in relation to its environment. Indeed, changes in the environment of the superorganism, depending on the character of the latter’s organization, can prompt changes in the kinds of behaviors the system deems to be pathological, and as a result, “old foes might become new mutualists,” and “conversely, old friends may turn bad.”427

Interestingly, socio-economic development has been linked to increases in the incidence of allergies and auto-immune diseases.428 One increasingly popular explanation is that the absence of exposure to environmental stimuli and threats, as a result of urban life and the hygiene revolution, has deprived the immune system from the challenges it needs to develop normally. Without threats to manage, the immune system does not develop normally and in some cases will turn on the organism itself; “give us this day our daily germs!”429 This raises interesting questions about the international system. Could a similar process

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427 Eberl 2010: 455.
428 I thank Theo McLaughlin for suggesting this example.
explain the proliferation of new securitizations of previously non-securitized issues – poverty, health, climate, terrorism, crime, etc. – following the end of the Cold War? Does the international system need external threats in order to stay on the tracks to individuality?

*The social control of reproduction*

The social control of reproduction is another key de-Darwinization mechanism. As discussed in chapter 2, an important characteristic of METIs is that lower-level units that were previously able to reproduce autonomous only do so, after the transition, through the higher-level unit.430 Indeed, a key problem all METIs must solve is how to prevent lower-level units from reproducing independently and/or beyond levels that are optimal for the higher-level system; units must reproduce for the superorganism’s sake, not their own. If lower-level units reproduction remains unchecked, Darwinian competition dynamics risk unraveling the new cooperative unit, as is the case with tumors, which are cells whose reproduction has spun out of the control of the organism.

Honey bees offer an interesting illustration of the importance of controlling reproduction in a superorganism because, despite their significant potential for Darwinian conflict, they exhibit in fact very little actual conflict. Potential Darwinian conflict in the beehive has two sources: sexual reproduction and the worker’s capacity for independent reproduction. First, because they reproduce sexually, there is great genetic diversity among the more than 20,000 worker

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bees in a colony and, as Seeley observes, “natural selection theory tells us that whenever there is genetic heterogeneity within a group there is great potential for conflict among the group’s member.”

Second, while reproduction in honey bee colonies works through a single ‘queen,’ individual workers retain the capacity to independently produce viable eggs. These eggs, then, have the potential of becoming male offspring, since unfertilized eggs become males and fertilized eggs become females. This creates a potential for conflict because independent reproduction appears to be a good strategy from selfish genetic standpoint. Indeed, as Seeley points out, “a worker’s genetic interests ... are better served by producing sons, each of whom carries 50 percent of her genes, rather than by helping the queen produce males who are her (the worker’s) brothers, since they carry only 25 percent of the worker’s genes.”

Yet, despite the Darwinian advantages of independent reproduction, less than 0.1 percent of male workers are actually produced by independent reproduction.

This raises an interesting puzzle, namely what explains the absence of competition in the bee hive in spite of the presence of incentives to compete, which brings us to ask what de-Darwinization mechanisms are at work preventing independent reproduction and Darwinian conflict from taking off inside the colony. The key mechanisms are the colony’s centralization and social control of reproductive functions around the queen. There is a strong ‘norm’ in

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432 Ibid: 11.
433 Ibid: 11.
the colony: only eggs laid by the queen are ‘legitimate’ and should be fertilized. Worker-laid eggs should not be fertilized and should instead be systematically destroyed. This sexual division of labor between the queen and her workers is ‘policed’ by the workers themselves in a kind of ‘Foucauldian governmentality.’

Indeed, workers systematically attack egg-laying workers violating the norm and destroy their eggs, thus displaying a form of ‘altruistic punishment.’

What explains the emergence of this division and social control of reproductive functions? A group-selection approach highlights how controlling reproduction is a crucial prerequisite to the honey bees’ ability to exploit swarm cognition and cooperate in other areas vital to the survival of the hive, such as foraging and comb-building. In a regulated environment where independent reproduction is systematically enforced, honey bees can focus their energies on working for the sake of the colony rather their own. Controlling reproduction is crucial for the bee hive’s ability to reproduce itself, by making sure that there is a constant supply of workers. And since honey bees’ ability to communicate and coordinate individual actions dramatically increases the geographic range of the hive and its ability to concentrate its foraging activities in high yield areas, bees living in colonies do better than those who do not.

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434 Foucault 2010.
435 Seeley 1995; Fehr and Gächter 2002.
The self-producing organization and structure of the international system

In the introductory chapter I have argued that the international system is typically viewed, across the main paradigmatic divides of IR theory, as a Darwinian population of state individuals that simultaneously constitutes these state individuals’ primary strategic and/or social environment. I have further suggested that this understanding of the international system is reinforced by common beliefs we hold about the nature of individuality in world politics.

In this chapter, having defined superorganisms, their self-producing organization, and the de-Darwinization mechanisms that sustain them, I can return to the hypothesis that the international system individual is an emerging superorganism. I will argue that the international organization of sovereignty holds the key to the self-producing organization of the contemporary international system superorganism.
I begin by agreeing with Wendt that individual states are organisms. But while I will suggest that sovereignty constitutes the self-producing organization of the individual state, I will push the argument further and argue that sovereignty is increasingly extrinsic to the state: the autopoietic organization of sovereignty is emerging at the international level. I will show that the organization of sovereignty at the system level meets the key criteria for autopoiesis, which will further support the hypothesis that the international system is undergoing a METI and becoming a superorganism. I will then go on to describe emerging de-Darwinization mechanisms at the international system level that play the role of swarm cognition, immune reaction and the social control of reproduction for the international system superorganism.

**Sovereignty and state organisms**

The concept of sovereignty is undoubtedly an “essentially contested concept” A few key axes of debate are: (1) whether internal or external sovereignty comes first; (2) whether sovereignty is about autonomy or mostly about authority; (3) whether sovereignty is intrinsic or extrinsic to the state; (4) whether the recognition of sovereignty is declarative or constitutive of sovereignty; and (5) whether sovereignty is indivisible. Different theories of sovereignty take different sides over these issues and it would be easy to get lost in these

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438 Gallie 1955.
439 Good discussions of the literature on sovereignty can be found in Thomson 1995; Krasner 1999; Jackson 2007.
multifaceted debates in an attempt to do them justice. Because doing so is beyond
the scope of the argument I want to make here, in the context of this chapter, I
will limit my discussion to a contrast of two perspectives – one in which
sovereignty is understood as a property of individual states and one in which
sovereignty is understood as a property of the international system. While the
first perspective is foundational to the anarchy problematic and the way IR
scholars generally think about the international system, the second has received
increasing support in IR but has not yet generated its own alternative, structural
perspective on the international system. As a result, while more and more IR
scholars accept the international dimension of the constitution of sovereignty,
most continue to think about the international system as if sovereignty was
essentially and/or primarily intrinsic to the state.

The idea that sovereignty as intrinsic to individual states is constitutive of the
picture of the international system as Darwinian/anarchic population/environment. In this conception, sovereignty is seen primarily as an
attribute of individual states. This assumption is a frequent assumption of IR
theory. It is made by Neorealists, but also often implicitly shared by IR scholars
of other persuasions, such as Neoliberals, Wendtian Constructivists and English
School scholars (with notable exceptions like Martin Wight).\textsuperscript{440} Hedley Bull’s
definition of the sovereign state offers an apt illustration of this perspective.

\textsuperscript{440} Bull 1977; Manning 1975; James 1986. For an alternative view from the English School see
Wight 1977.
The starting point of international relations is the existence of states, or independent political communities each of which possesses a government and asserts sovereignty in relation to a particular portion of the earth’s surface and a particular segment of the human population. On the one hand, states assert, in relation to this territory and population, what may be called internal sovereignty, which means supremacy over all other authorities within that territory and population. On the other hand, they assert what may be called external sovereignty, by which is meant not supremacy but independence of outside authorities.”

Neorealists and Neoliberals also assume sovereignty in their definition of the state. The assumption that sovereignty is intrinsic to the state is at the heart of the idea that the international system takes place on an anarchic plane. As Waltz put it, “to say that a state is sovereign means that it decides for itself how it will cope with its internal and external problems.” Gilpin concurs, “in that it must answer to no higher authority in the international sphere.” In a world populated by sovereign states, there is no room for other forms of authority above. The international system is anarchic because it is populated by sovereign states. Similarly, while it adds a social aspect to anarchy, the English School’s triad of state, system and society also begins at the more basic level with preexisting, already sovereign states that, through sufficient interactions, may form a sovereign state system, and through agreement over common rules, may contract into an anarchic society.

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442 Waltz 1979: 96.
Assuming that state sovereignty is intrinsic to the individual state enables scholars to frame problems in terms of the interaction of preexisting units under anarchy. The anarchy problematic has defined much IR theorizing over the last decades. As Barnett and Sikkink correctly point out, “the study of international relations has largely concerned the study of states and the effects of anarchy on their foreign policies.”\textsuperscript{445} As I have noted in the introduction chapter, while there have been intense disputes over the meaning of anarchy, few IR scholars have challenged the idea that the international system is fundamentally anarchic; even the scholars who want to argue for the presence and importance hierarchical relations locate these relations on top of a more fundamental anarchic structure.\textsuperscript{446}

Where IR scholars disagree is on whether sovereignty should be understood primarily in terms of state autonomy or as state authority. Liberal interdependence theorists have argued in the 1970s-80s that sovereignty is receding because states are losing exclusive autonomy over many domestic phenomena, both in the security and economic domains.\textsuperscript{447} Similarly, David Lake has revived interest in the study of hierarchical relations among states, which he views as involving the surrender of autonomy over key issues such as security and defense.\textsuperscript{448} With these few exceptions in mind, however, most IR scholars today prefer to think of state sovereignty as authority. As Janice Thomson put it, “state

\textsuperscript{445} Barnett and Sikkink 2008: 62.
\textsuperscript{446} Cf. ch. 1, fn.101.
\textsuperscript{447} Keohane and Nye 1977; Rosecrance 1986.
\textsuperscript{448} Lake 2009.
control has waxed and waned enormously over time, regions, and issue-areas while the state’s claim to ultimate political authority has persisted for more than three centuries.”

“The question is whether or not the state’s ability to make authoritative political decisions has eroded; that is, whether ultimate political authority has shifted from the state to nonstate actors or institutions.”

The idea that sovereignty is intrinsic to individual states fits right into the Darwinian perspective on the international system. As Wendt aptly pointed out, the state organism idea is implicit in this description of state sovereignty. “Where is the state’s sovereignty if it is not concentrated in a single person?” Wendt answers by locating sovereignty in the particular organization of the state:

“One answer is to recognize that, even as a property of state actors, sovereignty is really a property of a structure.... This ‘physiological’ structure relates the various individuals and bureaucracies which make up a state actor to each other, assigning functional, territorial, or issue-area sovereignties within a framework of rules and procedures for settling jurisdictional conflicts and ensuring their harmonious operation. The argument here is similar to that made above about the state’s monopoly of force: what gives a state sovereignty in the face of its internal division is an organizational structure of non-rival, unified authority that enables its parts to work together as a unit or ‘team’.”

Going back to the five debates on sovereignty, thus, Wendt is arguing that sovereignty, viewed as primarily internal and about a claim to authority, is indivisible and intrinsic to the state, being a product of its structure, which enables it to act as an autonomous actor in world politics. The international

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450 Ibid: 216.
recognition of a state’s sovereignty is therefore seen as mostly *declarative*; states are *de facto* sovereign before they are recognized as sovereign by others.

Wendt is making explicit an assumption that remains in implicit form in most IR theories, namely that states are sovereign for the same reason human beings are sovereign: because they are individuals. And they are individuals because they are, again like human beings, organism-like at the level of their organization. “The state is pre-social relative to other states in the same way that the human body is pre-social. Both are constituted by self-organizing internal structures, the one social, the other biological.”452 While not all IR scholars would agree that the state *is* an organism, the assumption that the state is *organized like one* is nonetheless implicit in the way they treat the state as an autonomous purposive actor.

Wendt unpacks his argument about the essential state in “The State as Person.” There he further defines the state as a self-producing system. “Like organisms ... state persons are autopoietic systems.”453 On the one hand, he argues, the state actively (re)produces “a spatial and political boundary between a domestic inside and a foreign outside.... [On the other, states also] have an internal structure that channels the behavior of their members toward the goal of state survival (‘national security’).”454

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452 Ibid: 198.
453 Wendt 2004: 308.
454 Ibid: 308.
Wendt goes on to argue that the self-producing organization of the state constitutes it as an essentially self-interested entity. Self-producing systems are biased towards the maintenance of their capacity to self-produce. Similarly, individual states’ corporate interests are defined by “the reproduction requirements or security of state-society complexes.”455 Another way of putting this is to say that state interests are defined in terms of the state’s ability to reproduce its sovereignty. Since these processes of self-preservation are locked inside individual states, they are not presumed to exist at the international system-level. Corporate interests are “intrinsic to states; relative to the international system they are not social constructions.”456 Wendt thus concludes that, “all other things being equal, the international system contains a bias toward ‘Realist’ thinking,”457 which is consistent with the argument I made in the introduction that assuming the state is like an organism leads us to picture the international system as a Darwinian environment (and vice versa).

Is state sovereignty really autopoietic, as Wendt suggests? In order to constitute a self-producing system, a system must meet six criteria:

“The first three criteria are general, specifying (1) that there is an identifiable entity with a clear boundary, (2) that it can be analyzed into components, and (3) that it operates mechanistically, i.e., its operation is determined by the properties and relations of its components. The core autopoietic ideas are specified in the last three (criteria). These describe (4) a dynamic network of interacting processes of production, (5) contained within and producing a

455 Wendt 1999: 234.
boundary (6) that is maintained by the preferential interactions of its components. The key notions, especially when considering the extension of autopoiesis to nonphysical systems are the idea of production of components, and the necessity for a boundary constituted by produced components.”

It is not difficult to argue that the state meets all six criteria. (1) The identifiable entity is the state and its boundary consists in the clearly defined territorial limits that bound its claim to authority. (2) The state can easily be analyzed into components: individual citizens, leaders, soldiers, institutions, bureaucracies, etc. (3) In most theories of foreign policy the state is described as operating mechanistically: foreign policy is the product of the interaction of the state’s key components. Most importantly, (5) the state’s claim to sovereign authority produces a boundary between the domestic and foreign realms. This boundary excludes foreigners and constitutes citizens over which the state then holds a monopoly over legitimate violence in exchange for protection (which Tilly cynically puts as the state’s “protection racket”). Citizens, in turn, legitimate the sovereign power of the state in their daily practices, by paying their taxes, by voting, by using their passport, by dying for their country when asked to, etc. The relationship between state sovereignty, citizens and the state’s institutions can thus be seen as a bounded, circular network of self-production in which states produce citizens and citizens reproduce the state via their participation in the state’s institutions and practices (4 and 6). The state is a club in which membership (citizenship) comports important rights, privileges and obligations.

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Like organisms, then, the processes of boundary production in each state establish different environments for those living inside and outside state boundaries.

Some of Wendt’s constructivist critics have attacked his argument that states precede the international system. As Wendt recognizes in a rather uncommon, preemptive auto-critique, “to be a state presupposes a boundary between itself and the environment, and as such even its corporate identity is constitutionally dependent on other states or ‘difference’.”\(^{460}\) Wendt acknowledges that the state’s autopoiesis means that the state is a product of its boundary, which is itself the product of contact with its environment (in the Darwinian perspective on the system, recall that the environment is understood as being composed mostly of other states). “Even the ‘essential state’,” he concedes, “exists only in virtue of ongoing processes of differentiation from its environment.”\(^{461}\) However, he also notes that

> “state identity is about the production not only of difference from without, but of sameness within. The latter cannot be reduced to the former, and indeed can be expected to resist outside efforts to destroy the boundary (by attempted conquest, for example). To that extent, even as it is constitutionally dependent on difference, state agency is also exogenous to it.”\(^{462}\)

There is no doubt that the state’s environment matters in the production of the state’s boundaries. The interesting question is: in what kind of environment is the individual state’s boundary defined? In the next section, I will push further my

\(^{460}\) Wendt 2005: 204.
\(^{461}\) Ibid: 204.
\(^{462}\) Ibid: 205.
contention that the environment states live in is increasingly like the internal environment of a superorganism. Echoing Wendt's reflection, I will argue that processes of production of both difference from its environment and sameness within also increasingly takes place at the level of the international system itself. Through an alternative reading of contemporary sovereignty and a new biological theory of the international system, I will argue that the contemporary international system is also, like citizenship, an exclusive club whose membership comports rights, privileges and obligations. States increasingly have a stake in the maintenance of the international system’s organization; in other words, states share, at their corporate level, an interest in the survival of the exclusive club on which their sovereign privileges increasingly depend.

**Sovereignty and the international system superorganism**

The way we typically construe sovereignty (as the private property of the state) and the international system (as an anarchy) seems to suggest that the international system cannot itself be a self-producing system. If we buy the anarchy problematic, uncertainty, the risk of war, the security dilemma, and relative gains concerns represent serious obstacles to the kind of organization that autopoiesis implies. This reasoning is supported at the biological level by traditional (neo-) Darwinian perspectives, which until recently ruled out superorganisms for similar reasons. The new biology, however, tells us that superorganisms, collections of single organisms possessing the functional
organization of a single organism, are not only real, but that symbiotic associations might actually constitute the norm among the living. In chapter 2, I have challenged these assumptions and argued that the international system appears to be in the midst of a METI. Could the international system be a superorganism? From the previous discussion, this would mean that self-production processes, sovereignty in other words, are not only taking place at the individual state level, but that they are also taking place at the international system level.

In the pages that follow I will argue that the international system is a self-producing system and that its autopoietic organization, like the state’s, originates in the increasingly international organization of sovereignty. I support this argument with an alternative reading of sovereignty; a top-down take on sovereignty in which exclusionary, international practices of mutual recognition constitute, not only internal differentiation among the states that compose the system, but also, and more fundamentally, an external boundary between states and non-state actors. This will involve recasting international sovereignty practices as forming a closed network of self-production. In a nutshell: sovereignty exhibits autopoiesis in the sense that it produces components (states) and processes (mutual recognition practices) which, together, (re)produce the very organization (international sovereignty) that produced them in the first place.
Note that I am not invalidating Wendt’s argument that individual states are intrinsically sovereign, even as they increasingly derive much of their authority and power extrinsically, from recognition and empowerment as full-fledged members of the international system. However, I want to suggest that this should not lead us to underestimate the importance of mutual recognition for the state organism: most individual states today could not enjoy the same existence (and many could not exist at all) without the benefits of ‘colony life’. Indeed, the superorganism concept helps us make sense of what is going on in the contemporary system because it enables us to think about sovereignty and its autopoietic organization as operating at two levels simultaneously. Indeed, in a superorganism, the constituent units are organisms themselves. Just like individual ants can survive outside of the colony, then, individual states can also survive in isolation from the international system (Taiwan, Somaliland, and Northern Cyprus). However, because the superorganism’s own organization produces a boundary that mediates the interactions its units have with the colony’s environment, ceteris paribus ants and states will have very different life chances depending on whether they live inside or outside a colony. In the international system superorganism, I will argue, much of individual states’ authority and power comes from the international political organization that authorizes them as the only legitimate holders of metapolitical authority.

The new theory of sovereignty that I will propose approaches the institution from the perspective of the whole system (rather than from the perspective of the state). Like the internal-external sovereignty distinction we practice when
speaking about individual state sovereignty, in my systemic theory of sovereignty there will be two dimensions to the sovereignty coin, in this case a vertical and a horizontal dimension. The vertical dimension will be about sovereign recognition: what entities belong to the international system and which ones belong to its environment, as well as what special rights, privileges and obligations flow from membership in the system. The horizontal dimension will be about how the units of the international system are individuated vis-à-vis one another and how they should relate to each other. There, the more traditional picture of external sovereignty, the division of the international system into formally equal individuals, will resurface, albeit enriched this time by the prior vertical dimension, which will allow us to see the origins of formal equality in the more fundamental inequality between recognized states and unrecognized entities.

Finally, locating the state inside the international system superorganism will enable us to reach a new understanding of the essential state’s corporate interests, which will not only be defined in individual terms but in also social terms, through the prism of their special rights and privileges as members of the club of sovereigns. The old individualist take on sovereignty informs a utilitarian perspective on state’s interests, in which, as Ashley puts it “the individual acting unit is taken to be essentially private”, taken to have an existence that is “prior to and independent of larger social institutions,” and “understood as the
autonomous generator of its own ends.” I will propose a new perspective in which states will be understood as having fundamental common interests in the preservation of the sovereign state system itself. This shared interest comes from the organization of the international system and the state’s position within that organization. Because this shared interest is produced by the international system’s organization, I will argue that, in the contemporary system, there is a greater potential, or rather, less systemic obstacles for collective identification than what even Wendt believes. States’ constitution as autopoietic systems may predispose them to be selfish, but since the full realization of their potential is only possible inside the international system superorganism, this means that when the superorganism itself is threatened, they will tend to act together on its behalf.

**International sovereignty**

My perspective on sovereignty is inspired by but moves significantly beyond the works of a number of scholars who have, in the last 30 years, highlighted the importance of international processes in the constitution of state sovereignty. My contribution to this literature is to draw the structural implications and to justify them at the level of underlying biological assumptions. In IR, indeed, scholars such as Ruggie and Ashley have pointed to the unique and historically contingent character of the modern states system and the importance of recognition

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practices. Sovereignty, these critical scholars agree, is essentially about social recognition by the international community. “[T]he modern concept of sovereignty,” Ashley suggests,

“designates the collectively recognized competence of entities subject to international law and superior to municipal law. It thus involves not only the possession of self and the exclusion of others but also the limitation of self in the respect of others, for its authority presupposes the recognition of others who, per force of their recognition, agree to be so excluded.”

Others have highlighted the intersubjective and socially constructed character of sovereignty as an institution. Constructivists understand sovereignty as “a variable, practically constituted institution, its precise content and political implications varying with time and context.” Most recently, IR scholars have been interested in practices of recognition, showing how state authority and its scope are not timeless attributes of the state but the product of changing recognition practices. Once we accept that sovereignty is first and foremost about authority, we can ask whose recognition matters the most. There are two main theories about recognition, which have parallels in international law and IR theory. The first is the declarative theory of recognition, which views recognition as the declaration of an already existing fact. In this view, once a polity has achieved the trappings of statehood, it is then recognized by the international community as a sovereign state. The second is the constitutive theory of recognition, which holds that recognition by the international community

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effectively creates states, even in cases where the polity is not actually in control of the recognized territory.\textsuperscript{469}

Most would agree today that the Constructivist critique has succeeded in challenging the idea that sovereignty is intrinsic to the state and succeeded in highlighting the thoroughly social character of inter-state relations. However, their arguments have not yet challenged dominant understandings of the structure of world politics. Indeed, the anarchy problematic and the Darwinian perspective on the international system remain the most influential structural frame through which we think about the international system. The third image – seeing international politics from the prism of the anarchic international environment – remains the highest vantage point from which we think about international politics. The Constructivist critique has yet to produce a structural alternative to this flat, horizontal understanding of the international system. IR scholars continue to think about state interactions within the international system environment, without prior consideration of how the international system and in its environment interact. How sovereignty and mutual recognition constitute and reproduce the international system’s position of dominance over global politics, and how that affects inter-state relations themselves, remains undertheorized.

And yet, some of the most fascinating empirical support for the Constructivist critique on sovereignty comes from research highlighting the differential life

\textsuperscript{469} Fabry 2010.
chances among recognized and unrecognized entities. David Strang, for instance, contrasts the fate of pre-1945 non-European political entities with the fate of recognized states born out of decolonization. Before their colonization by European powers, non-European political entities were internally sovereign and were even seen as such by European explorers. “The question Westerners asked themselves was not whether non-Western societies possessed states, but what kinds of recognized rights – what sort of sovereignty – they thought these states possessed.”\textsuperscript{470} For a variety of reasons, notably the application of a set of criteria for statehood known as the “Standard of Civilization”,\textsuperscript{471} European powers did not recognize the legitimacy of these states, and non-recognition, which effectively meant the denial of their right to exist autonomously, made their conquest and/or partition possible.

Strang tracked changes in the status of political entities outside of Europe between 1415 and 1987. He found that, during the 500 or so years covered by his study, only 11 previously recognized entities became dependencies and 15 dissolved or were merged. These are remarkably low numbers once we compare them with changes of status among unrecognized entities and dependencies. Indeed, during the same period, 263 unrecognized entities became dependencies, 143 dependencies were merged with other entities, 86 were transferred from one Western power to another, and 22 were dissolved.\textsuperscript{472} “In the language of

\textsuperscript{470} Strang 1996: 31.
\textsuperscript{472} Strang 1991: 154-159.
stochastic processes,” Strang concludes, “sovereignty is virtually an ‘absorbing state’ which once entered is not left.”

The effects of formal recognition on the life chances of political entities are particularly interesting in cases where the entity recognized has not achieved internal sovereignty over its recognized territory. Robert Jackson and Carl Rosberg have shown that many cases of African states born out of decolonization owed their existence, not to de facto control over their territory (internal sovereignty) but primarily to their recognition as states by the international community (external sovereignty) in the process of decolonization. Meanwhile, other, more internally consolidated political entities like Somaliland, Northern Cyprus and Taiwan have not been able to enjoy the rights and privileges of statehood because they are not recognized as states. As Nina Casperson concludes in a rare study of non-recognized states, “although it is true, as Krasner has argued, that ‘nonrecognition does not condemn an entity to death or oblivion,’ it does come at a price for all unrecognized states; it constrains their ability to create entities that are sustainable in the long term and it puts a strain on their internal legitimacy.” “Non-recognized existence” as Mikulas Fabry puts it,

“has historically led to a range of adverse consequences. It has always been precarious and often lethal. One of the relatively milder upshots is the humiliation non-recognized entities have to bear by having their official name – official, that is, only in terms of their

474 Jackson and Rosberg 1982.
475 Casperson 2012.
own constitutional law – commonly placed in quotation marks abroad…. A much more substantial effect is the inability to carry out normal diplomatic and economic relations, to join international organizations, and to sign international treaties and agreements. The most serious consequences of non-recognition, as will be seen, is that those who find themselves in this position are legally exposed to being forcibly displaced from the territory they claim and control by the state actually recognized as sovereign in that territory. In the case of recognized countries enjoying the full protection of international law, in contrast, successful external takeovers have been a rarity, and even then the enduring claim that these states’ sovereignty was unjustly and illegally extinguished served in a few cases, such as Lithuania, Latvia, and Estonia in 1991, as a key justification for their later restoration.”

In a recent article, Tanisha Fazal and Ryan Griffith have argued that the privileges that flow from membership in the international system have increased the demand for statehood. The entrenchment of territorial norms, the growing network of IGOs, and the availability of IMF and UN support, they argue, have increased the benefits from statehood, and as a result, the demand for statehood on the part of secessionist movements.

This more recent research suggests that mutual recognition practices play a role in the constitution of a two-tiered structure in world politics. Indeed, there are two environments in world politics, from the perspective of the international system. On the one hand, there is the internal environment of the system, namely, inter-state relations and the institutions states have created to manage these relations. In this environment, states enjoy the attractive bundle of rights (but also important obligations) that come with sovereign recognition. On the

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476 Fabry 2010: 7.
477 Fazal and Griffith 2014.
other, there is the environment of the international system, which is composed of myriad non-recognized actors and processes with which the international system interacts with. States enjoy important privileges in their relation with the international system's environment.

In chapter 2 I have interpreted the emergence of the boundary between internal and external environments of the international system in terms of a METI. I am now about to frame this boundary in physiological, structural terms, as the product of the emerging self-producing organization of the international system. Thus far, no structural theory of international politics has captured the implications of seeing the international system in its own environment, which would constitute a *Fourth Image of international politics*. Our structural understanding of world politics has hit a ceiling with the Third Image of international politics.478

**The international system as a self-producing system**

I build my autopoietic theory of sovereignty on Janice Thomson’s definition of sovereignty as “the recognition by internal and external actors that the state has the exclusive authority to intervene coercively in activities within its territory”479 and on the concept of international practices, which I define as practices taking place on a global scale in which the recognized representatives of sovereign states hold a shared monopoly over competent performance.

478 Waltz 1959.
Thomson’s definition views sovereignty as both intrinsic and extrinsic to the individual state, which makes it compatible with the superorganism concept. What is more, it leans towards seeing sovereignty as being about a claim to authority, rather than about control. This claim to authority, however, is more fundamental than the Weberian claim to a monopoly on legitimate violence. Sovereignty, Thomson suggests, “imparts to the state ... meta-political authority” which she defines as the authority “to decide what is political in the first place.”480 While a central one, the monopoly on legitimate violence is one of the claims that the system makes about the scope of the state’s authority. As such, it ultimately rests, with other monopolies and privileges, on the state’s meta-political authority. States do not only hold a monopoly on legitimate violence: they have the more fundamental authority to decide that their violence is legitimate. Thomson’s concept of meta-political authority captures what Carl Schmitt calls the sovereign state’s “right to decide the exception,” that is, to determine what constitute ‘exceptional circumstances’ justifying the suspension of the law.481

Successful claims to a monopoly on legitimate violence ultimately contribute to the reproduction of the state’s meta-political authority. Indeed, when challenged, states have the capacity (the legitimacy and authority) to mobilize coercive resources that dwarf those of their potential non-state rivals, such as terrorist groups, pirates or multinational corporations. This is to a great extent the result

480 Ibid: 214.
481 For a discussion, see Prozorov 2005.
of the fact that most citizens in most countries continue to accept, explicitly or tacitly, the state’s claim to a monopoly on legitimate violence, by continuing to perform the various everyday practices, such as putting up with extensive security checks at the airport, that sustain the statist order. Of course, this is not always the case. Many states see their authority challenged and some are ‘failed states,’ which brings me to another source of the power of the state, namely its location within the sovereign states club. In cases where a failed state threatens to enable the emergence of alternative forms of governance, other states have intervened to bolster the struggling state, in the name of collective security, as has been the case in the War on Terror, the case of piracy off the coast of Somalia, and more recently in the fight against the Islamic State.\textsuperscript{482}

The matter cannot be settled with definitions, but only by showing that I can organize contemporary phenomena around the idea that the international system is a self-producing system. Building on Thomson’s definition, what I need to demonstrate is that the production of metapolitical authority increasingly takes place internationally. I begin making that case by comparing the organization of international sovereignty to the six criteria for autopoiesis that I have previously used to describe the autopoietic organization of state sovereignty. Then, I will go on to describe the international system’s organization, structure, and the dynamics of organizational closure we find in international practices. Recall the six criteria for autopoiesis:

\textsuperscript{482} See Mendelsohn 2009.
“The first three criteria are general, specifying (1) that there is an identifiable entity with a clear boundary, (2) that it can be analyzed into components, and (3) that it operates mechanistically, i.e., its operation is determined by the properties and relations of its components. The core autopoietic ideas are specified in the last three (criteria). These describe (4) a dynamic network of interacting processes of production, (5) contained within and producing a boundary (6) that is maintained by the preferential interactions of its components. The key notions, especially when considering the extension of autopoiesis to nonphysical systems are the idea of production of components, and the necessity for a boundary constituted by produced components.”

Making the case that the international system meets criteria 2 and 3 is comparatively easy. The international system can definitely be analyzed into its components, states, and it operates mechanically. This is actually what most IR theory has been about. The other criteria are more interesting, but also somewhat more problematic, so I will spend more time on their justification.

The international system – the network of mutual recognition – constitutes a dynamic network of self-production (criterion 4). International sovereignty (re)produces sovereign states, the principal ‘components’ of the international system. It does so by (re)producing their metapolitical authority. Each state owes much of its existence and power to its recognition by other states. The international system ‘empowers’ individual states. Richard Ashley proposes an understanding of sovereignty, from a competence model, that captures the autopoietic organization of the mutual recognition of sovereignty from a system perspective. As Ashley puts it, sovereignty “involves not only the possession of

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self and the exclusion of others but also the limitation of self in the respect of others, for its authority presupposes the recognition of others who, per force of their recognition, agree to be so excluded.”484 This is based on a competence model of social action. Ashley’s presentation is worth quoting at length:

“The power of an actor, and even its status as an agent competent to act, is not in any sense attributable to the inherent qualities or possessions of a given entity. Rather, the power and status of an actor depends on and is limited by the conditions of its recognition within a community as a whole. To have power, an agent must first secure its recognition as an agent capable of having power, and, to do that, it must first demonstrate its competence in terms of the collective and coreflective structures (that is, the practical cognitive schemes and history of experience) by which the community confers meaning and organizes collective expectations. It is always by way of performance in reference to such collectively 'known' (but not necessarily intellectually accessible) generative schemes that actors gain recognition and are empowered. Thus, according to a competence model, building power always has a community-reflective performative aspect.”485

In other words, sovereignty is not a private possession of the state but a recognized status within a community of similarly recognized actors. In such a context, statesmanship is not only about achieving the state's domestically defined interests, but it “is the art of orchestrating the (re)production of the state in a transnational context of other statesmen similarly engaged.”486 International sovereignty, thus, is a network of mutual recognition that produces sovereign states and defines the scope of their authority. Where does this shared power to decide over metapolitical authority come from? States derive much of their

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484 Ashley 1984: 272, fn.101.
486 Ibid: 269.
authority (and power) from their position within an exclusive group that has succeeded in granting itself a monopoly over metapolitical authority. It follows, then, that states will have a deep interest in the reproduction of the structure that underpins its privileged position. When this system is itself threatened, states should exhibit a willingness to forget their disagreements in order to defend the source of their shared authority. To see the source of this authority, we must look at how international sovereignty produces a boundary that closes the network of self-production from its environment.

Does sovereignty produce a ‘clear boundary that defines the international system as an entity’ (criteria 1 and 5)? Seen from the perspective of an individual state, this criterion is easy to see. It is easy to see how sovereignty carves a boundary between what is inside states (the domestic) and what is outside (the foreign, the international). This idea is constitutive of the IR discipline and structures how it, alongside other disciplines like sociology, frames problems. From the perspective of the state, sovereignty delimits the sphere of authority of the state vis-à-vis society (inside) and vis-à-vis other states (outside).\textsuperscript{487} Thomson describes state authority in terms of its extensiveness and intensiveness. “The functional dimension delineates the precise range of activities over which states can legitimately exercise their authority (extensiveness). Within this range, variable across issue-areas and actors, the depth of state authority – or put differently, the degree to which state authority penetrates society (intensiveness) – may vary.”\textsuperscript{488}

\textsuperscript{487} Walker 1993.
\textsuperscript{488} Thomson 1995.
As I have already suggested, to say that individual states are autopoietic is a tacit assumption of much IR theory.

However, in order to see the autopoietic organization of sovereignty at the level of the whole system, we need to change our perspective. From the perspective of the system, sovereignty delimits the sphere of authority of states and the states system as the dominant form of political organization over non-state actors. From the perspective of the system, sovereignty determines membership: who belongs to the international system. It also determines that only states should be sovereign over a given territory. To identify the boundary that sovereignty (re)produces, we need to look at sovereign recognition, and more specifically, at who can be sovereign. The external boundaries of the system define the state’s authority over non-state actors and other systems, such as the global economic system.

Evidence of a boundary between the international system and its environment is found in the differential life chances of units living inside and outside the international system. As Strang and others have shown, from the perspective of their life chances, there is a clear boundary between the club of sovereign states and those it excludes.489 Whether an entity is recognized as a state or not makes a dramatic difference on the kind of constraints and opportunities that it faces: they live in different systems.

Finally, are these boundaries produced by the ‘preferential interactions of the system’s components’ (criterion 6)? Who has the right to decide over state sovereignty? Who decides on metapolitical authority in global politics? In other words, who decides who has the right to decide the exception? Sovereign states do. And although recognition is the prerogative of every state’s executive, the Great Powers take a leadership role in doing so. Entities outside of the club of sovereigns cannot decide on the issue of sovereign recognition. International sovereignty produces and reproduces a closed network of self-production. I want to argue that this is the principal source of the power of international sovereignty. Sovereignty produces more of itself and, ultimately, rests on itself, even as it has to feed itself from resources in its environment (as in the co-optation of liberal norms via doctrines of popular sovereignty).

I will further argue that the boundaries of state authority are produced and reproduced via international practices – international law, diplomacy, war – in which only states can be legitimate participants. The international system is what Murphy calls a ‘system of social closure;’ non-state actors are excluded from the circle of mutual recognition. We can thus say that sovereignty is the product of the preferential interaction of its components: state actors, via exclusionary mutual recognition practices, jointly produce states and the state system.

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490 Fabry 2010, Coggins 2014.  
491 Murphy 1988.
The closed nature of the recognition network is an important source of sovereign power, and this is where we should look for “systems change.”\textsuperscript{492} It captures Thomson’s suggestion that

“a shift from sovereignty to some other form of global political organization would entail one or more of the following: the loss of states’ exclusive authority to recognize sovereignty; transfer of meta-political authority to nonstate actors or institutions; end of the state’s monopoly on legitimate coercion; and deterritorialization of states’ authority claims.”\textsuperscript{493}

There is indeed a remarkable circularity in the way sovereignty is organized. As Strang perspicaciously notes, without elaborating further unfortunately:

“The process by which state and sovereignty define each other would be virtually impenetrable in a world flawlessly aligned with the Westphalian ideal. Centralized political structures would partition the globe and its human population. Such states would formally recognize each other with unambiguous reference to neutral textbook criteria: a clearly delimited territory, population, and a stable and independent government. The mutually constitutive interplay between understandings and structures would be hard to observe, because cultural codes like recognition and obvious concentrations of power would everywhere coincide, reinforce, and legitimate each other.”\textsuperscript{494}

It would be difficult to find a better description of the formal organization of the international system, in a vacuum chamber. In the theory of self-producing system, organization consists in formal principles that define the arrangement of parts and processes. Recall, however, that in the logic of self-producing system, any organization, once it enters interaction with its environment and in order to

\textsuperscript{492} Gilpin 1981.
\textsuperscript{493} Thomson 1995: 214.
\textsuperscript{494} Strang 1996: 23.
interact with its environment, must be realized in a *structure*. At the level of its realization in a structure, the organization of the international system is obviously does not appear as clean as Strang’s description suggests. The sovereign state system lives in an environment that is often challenging, which requires it to modify its structure in order to maintain this flawlessly circular organization. How sovereignty uses its environment to *develop* itself in interaction with this environment, so as to maintain its fundamental organization, is going to be the theme of chapter 4, where I will discuss this example and other ones. As I have suggested above and will discuss further in chapter 6, norms of popular sovereignty and the Responsibility to Protect can both be seen as developmental adaptations to the structure of sovereignty that have performed the function of co-opting important normative challenges in the system’s environment. Yet, as I will discuss in greater length in chapter 6, none of these reforms have been perfect adaptations and some of them, notably self-determination, probably have generated more problems for the international system than they have solved.

*The organization and structure of the international system*

Having justified the application of the logic of self-producing system to the case of the international system, I can begin describing the autopoietic organization and structure of the system. To do so, I use the sociological concept of differentiation, which is experiencing a resurgence in IR. As Mathias Albert
and Barry Buzan put it, “differentiation is about how to distinguish and analyse the components that make up any social whole: are all the components essentially the same, or are they distinguishable by status, capability or function?”496 All societies, Luhmann argues, can be differentiated according to one or more of only three types of differentiation: segmentation, stratification or function.497

Segmentary systems are systems “where every social subsystem is the equal of, and functionally similar to, every other social subsystem.”498 Stratificatory systems are systems “where some persons or groups raise themselves above others, creating a hierarchical social order. Stratificatory differentiation can be further subdivided into rank and class forms distinguished by whether or not there is significant inequality not just in status (rank), but in access to basic resources (class).”499 Finally, functionally differentiated systems are systems “where the subsystems are defined by the coherence of particular types of activity and their differentiation from other types of activity, and these differences do not stem simply from rank.”500

What mode of differentiation characterizes the international system? At first sight, the ‘anarchic’ international system appears to be best described as a segmental realm. “Segmentation differentiates the society into equal

496 Buzan and Albert 2010: 316.
497 Luhmann 1982; also see Buzan and Albert 2010.
498 Buzan and Albert 2010: 318.
500 Ibid: 318.
subsystems,” and indeed, the international system is typically understood as a horizontal realm where formally equal (but informally unequal) sovereign states interact. This is Waltz’s contention. In defending his description of the international system as segmentary, Waltz opposed it to functional differentiation. Waltz argued that “the states that are the units of international-political systems are not formally differentiated by the functions they perform.... So long as anarchy endures, states remain like units.”

As I have already suggested, this view has been challenged, but not in a fundamental way. The IR literature has not focused on whether the international system was an anarchy, but has rather been about the terms on which anarchy is established. As Ruggie puts it, “if anarchy tells us *that* the political system is a segmental realm, differentiation tells us *on what basis* the segmentation is determined.” Similarly, some have argued that there are important hierarchical elements in the international system. In recent years there has been a renewed interest in hierarchical relations in international politics, but as I have suggested earlier, most of this work assumes that anarchy constitutes a more fundamental structure.

The widespread view that the international system is fundamentally a segmental anarchy misses the double standard, and thus the prior hierarchy, on which this segmentation rests. We can more usefully describe the international system as

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502 Waltz 1979: 93.
503 Ruggie 1983: 274. Italics in the original.
504 Cf. ch. 1, fn.101.
'stratified.' Stratification produces a hierarchy between two or more strata, but the focus on this hierarchical element should not obscure the fact that there is generally equality of status within strata. In other words, a segmental realm can sit atop a more fundamental stratificatory structure, and thus, the international system can remain an anarchy even while sitting atop a more fundamental hierarchy.

Historical examples of such structures are not hard to find. The Ancient Greek city-states of Athens and Sparta, despite their different modes of government, were both highly stratified societies, the first resting on the distinction between citizen and non-citizens (there were over twice as many non-citizens as there were citizens), the second on the distinction between free men and slaves. In both cases, relations among members of the higher strata were based on formal equality, and in both cases this equality was premised on a prior hierarchy. Similarly, I have argued, the international system can be seen as a ‘social closure’ system founded on the distinction between the unequal division of rights and privileges between state actors and non-state actors.

The shift in structural perspective that I propose in this chapter also mirrors Marc Bloch’s critique of François Louis Ganshof’s description of the feudal system. Ganshof’s influential depiction of the feudal system focused on the relationships between lords, vassals and fief: the ‘warrior aristocracy.’

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505 Luhmann 1977: 33. Functional differentiation divides society according to the functions subsystems perform.
506 Murphy 1988.
507 Ganshof 1964; Bloch 2014.
critique was that this perspective neglected another, more fundamental and important set of relationships, the relationships between lords, peasants and the manor. Exclusive attention to relationships of equality and inequality within the higher strata of feudal society, Bloch argued, yielded an incomplete understanding of the social identities and roles of lords and vassals. Integrating lord-peasant hierarchy helped shed a new light on lord-vassal relations and shared aristocratic interest in the domination of the peasantry, the source of their social power in the first place. Bloch’s re-description of feudal structure led to a greater attention to the sources of noble privilege, which made possible the kind of lifestyle characteristic of the warrior aristocracy.

Inspired by Bloch’s critique of Ganshof, I suggest that states can be seen as forming an international aristocracy constantly working to reproduce its privileged position over global society. I want to argue that there is an important ‘vertical’ element to the structure of the international system, as evidenced by the important differences I have already noted in the life chances of the units in the upper stratum compared to those in the lower stratum. Citizenship in Athenian society can be viewed as an intrinsic ‘possession’ of individuals of the higher strata. But it can also be viewed as a collective achievement of that higher stratum, with its privileges purchased on the back of the lower ones and requiring work to ensure their reproduction. The same can be said about feudal society: without their collusion on the backs of the peasantry, the nobility’s particular lifestyle would have been impossible. The knight’s armor, for instance, is commonly seen primarily as a protective device, and sometimes as the product of
an ‘arms race’ among the nobility. Without the work of the knight’s retinue, however, heavy armor would have been not much more than a burden. What is more, the knight’s armor (until the introduction of crossbows) enabled the nobility to hold a decisive advantage in face-to-face combat, and to fight according to the code of chivalry. Because of the cost of armor and the extensive social organization that made its use possible, however, armor also had the significant effect of excluding the peasantry from the practice of ‘legitimate’ war.\footnote{McKeogh 2002.} The introduction of the crossbow, however, by enabling to take down knights at a distance, threatened this advantageous structure, and quickly led the Church to demonize the new weapon. Similarly, sovereignty can be viewed, as IR scholars have done, as a property of the states that compose the international system and we can pay attention to the horizontal relations of rivalry among them. Alternatively, we can, as I suggest, view state sovereignty as a collective achievement of the sovereign states aristocracy and their rivalries as providing a justification for their continued domination of society (Tilly’s protection racket).\footnote{On the growth of international surveillance see Keiber 2014.} Seeing the vertical dimension of international structure makes a critical difference.

Sovereignty thus simultaneously (re)produces equality between states and hierarchy between states and non-states. Sovereignty does so through exclusionary mutual recognition practices which effectively make the system autonomous from its environment. This stratificatory logic is sovereignty’s
organization: the abstract principle that lies behind sovereignty. Figure 4.1 below illustrates the logic of the self-producing organization of sovereignty. This organization is realized through sovereignty’s structure, which consists in historically changing differentiation principles that are (re)produced and transformed in and through international practices. In the two subsections that follow, I give a description of these differentiation principles and describe some of the international practices that instantiate them.

![Diagram of the self-producing organization of sovereignty]

**Figure 4.1 – The self-producing organization of sovereignty**

*Structure I: External differentiation*

One set of differentiation principles, which I call ‘external differentiation principles,’ constitutes the external boundary of the international system, differentiating the system from its environment. Concretely, these have taken the
form of historically changing norms of sovereignty specifying criteria for the recognition of a polity’s sovereignty. The state system, which was initially European in scope, has in the decades following the Second World War come to cover the entire globe. Successive stages in the growth of the state system were accompanied and legitimated by transformations in the definition of sovereignty’s principles of external differentiation, which effectively defined the state system vis-à-vis the ‘terra nullius,’ the geographical space that ‘belongs to no one’ (in the eyes of the system, of course).

Initially, this principle was Christianity. Gradually, however, it came to be replaced by European Civilization as the moral foundation of sovereignty. “The old medieval boundary between Christendom and the non-Christian world was redefined as a line between the civilized Western world and the not yet fully or properly civilized rest of the world.”510 Western civilizational values were codified in the Standard of Civilization (SOC), a set of criteria for inclusion into the state system that also served as the basis for the development of international law during the period of European colonial expansion.511 David Fidler distinguishes between an ‘old’ SOC and a ‘new’ SOC. The ‘old’ SOC was articulated in response to the legal problems generated by European global expansion. Essentially, the issue was to figure out, in the context of an increasingly culturally heterogeneous world, “which countries deserved legal recognition and legal personality in

511 Gong 1984.
In order to be recognized as a ‘civilized’ member of the sovereign state system, a polity had to demonstrate that it

“(1) guaranteed basic rights, as understood in the West, for foreign nationals; (2) had an organized political bureaucracy with the capacity to run governmental functions and organize the country for self-defense; (3) had a Western-style domestic system of law, with courts and written codes of law, that administered justice fairly within its territory; (4) had diplomatic resources and institutions to allow the State to engage in international relations; (5) abided by international law; and (6) conformed to the customs, norms, and mores accepted in Western societies.”

The old SOC did not advocate a ‘deep’ transformation of non-Western countries; it was a way to enable asymmetric economic and political interactions between Europe and the rest of the world. While decolonization discredited the old SOC, Fidler argues that the SOC has returned under a new, ‘liberal developmentalist’ guise. The new emphasis is on human rights, the liberalization of trade and investment, public sector reforms and democracy promotion. Indeed, evidence of this new SOC can be found in many places: International Monetary Fund and World Bank conditionalities, ‘tied’ foreign aid, the European Union’s ‘Acquis Communautaire’ and the emerging ‘Responsibility to Protect’ (R2P) norm, which makes recognition and respect of a state’s sovereignty contingent on that state’s respect and protection of human rights.

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513 Fidler 2001:141.
515 Glanville 2011.
Another double standard, intimately related to the SOC is the ‘subject of war’ (SOW). The practice of the SOW offers an illustrative example of this double standard and its effect on the structure of world politics. The SOW is a category closely tied to the SOC that was used to determine who can legitimately wage war and therefore, to whom the laws of war ultimately apply to.\textsuperscript{516} While the SOW is primarily associated with the period of European colonial expansion, in which European states practiced a distinction between violence among mutually recognized, ‘civilized’ states, and violence between states and non-recognized, ‘uncivilized’ polities, we can find a similar distinction in the contemporary War on Terror, in which states have differentiated between ‘lawful’ and ‘unlawful enemy combatants.’\textsuperscript{517}

By defining the SOW, states collectively produce a distinction between legitimate and illegitimate violence that empowers state actors over non-state actors such as pirates and terrorists, enabling the states to mobilize their societies and cooperate against unrecognized actors, while simultaneously making it possible for the former to lift legal restraints in their violent interactions with the latter.\textsuperscript{518} Non-state violence is an issue over which states do not seem to encounter their usual cooperation problems. The so-called Somali piracy “miracle” – how the Great Powers rapidly cooperated over the establishment of the High Risk Area in 2010, coordinated their navies in an effort to eradicate piracy off the coast of Somalia, and ultimately succeeded in eliminating piracy in that region in less

\textsuperscript{516} Buchan 2009.  
\textsuperscript{517} Taft 2003.  
\textsuperscript{518} Thomson 1996.
than two year – is no miracle, from the perspective of the structural theory I am presenting here.\textsuperscript{519}

Obviously, whether the SOW succeeds in reproducing sovereignty and the state’s monopoly on legitimate violence depends on whether these structural advantages can translate into material advantages, which, in turn, also depends to a great extent on the constraints and possibilities created by the operational environment of the system, such as the technologies of destruction and of communication available. The impact of the material environment on the international system, however, is necessarily mediated by this structure and its related practices.

By commanding the loyalties of billions of people, states are empowered with unrivaled access to and control over people, resources and technologies. States, thus empowered by this structure and its practices, have a ‘vested interest’ in the reproduction of the distinction between legal and illegal violence because their power, and therefore, via the legitimacy that underpins this power, their existence, depend on them to a large extent.\textsuperscript{520} This could be termed the ‘ideational face’ of Tilly’s famous thesis that ‘war made the state and the state made war.’\textsuperscript{521} The Weberian monopoly on violence, which we have been accustomed to think about as the private possession of individual states, is

\textsuperscript{519} On the Somali piracy miracle, see Bueger 2015.
\textsuperscript{520} See Ashley 1984.
\textsuperscript{521} See Tilly 1975: 42.
actually a shared resource. In this sense, it is like noble privilege. It is sustained by and depends on an essentially closed network of mutual recognition.

Structure II: internal differentiation

On the basis of the hierarchy thus created, another historically changing set of principles, which I call ‘internal differentiation principles,’ individuates states vis-à-vis one another and specifies what roles, rights, obligations and responsibilities should regulate their conduct. Robert Jackson and Samuel Barkin identify three changes in sovereignty’s principles of internal differentiation, to which I will add a fourth.\textsuperscript{522} Initially, sovereignty was dynastic. While under the medieval order God represented the ultimate authority, in the ‘modern’ state system, final authority descended down to earth and was initially tied to the figure of the monarch, to such a degree that Louis XIV’s ‘l’État c’est moi’\textsuperscript{523} could be interpreted literally by his contemporaries. The French Revolution, which proposed to ground sovereignty claims in the Nation (popular sovereignty), posed a serious challenge to dynastic principles. The French constitution of 1791 declared that “Sovereignty is one, indivisible, unalienable and imprescriptible; it belongs to the Nation; no group can attribute sovereignty to itself nor can an individual arrogate it to himself.”\textsuperscript{524} Following Napoleon’s defeat, dynastic principles were restored, albeit under modified form.\textsuperscript{525} The Congress of Vienna (1815) grounded the principles of sovereignty in the institution of the monarchy,

\textsuperscript{522} Jackson 1999; Barkin 1998.
\textsuperscript{523} French for “I am the state” (my translation).
\textsuperscript{524} Cited in Jackson 1999: 444.
\textsuperscript{525} Kissinger 1957.
which, unlike the dynastic principles of the old regime, recognized the Nation provided that it was ruled by a monarch. While dynastic principles coupled sovereignty with the person of the ruler, in this first reform of sovereignty the state was now a distinct entity from its monarchical rulers.\textsuperscript{526} The rise of nationalism and the revolutions of 1848 eventually led to the emergence of the principles of national self-determination that guided the post-war settlements of the Great War.

In this new conception of sovereignty, the coupling between state and nation legitimated a state as sovereign in the eyes of the international community. The difficulty of coupling territory with a fluid ‘entity’ like the nation, however, greatly increased the potential for conflict in the system. Indeed, the ideal of national self-determination was an important cause of both of the World Wars of the twentieth century. Following the Second World War, thus, sovereignty was again modified, with territorial control becoming the legitimating basis of sovereignty. Territorial principles were inscribed in Principle 4 of Article 2 of the United Nations Charter, according to which “all Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations.”\textsuperscript{527}

Today, the territorial status quo is almost always upheld. While not entirely inviolate, borders are extremely durable. “It seems today that boundaries cannot

\textsuperscript{526} Barkin 1998.
\textsuperscript{527} United Nations: Art. 2.
be modified even to punish an aggressor state: Iraq retained is borders despite having committed the crime of aggression and having suffered an overwhelming military defeat in the Gulf War." Yet, the humanitarian interventions of the 1990s have raised new questions about sovereignty and as a result, a fourth reform appears to be under way and territoriality seems to be in the process of being amended. The R2P, which was endorsed by the United Nations General Assembly in 2009, makes territorial sovereignty conditional on the state’s protection of its citizens’ fundamental human rights. Intervention, which was illegitimate under territorial sovereignty, is now increasingly seen as legitimate in recognized cases of human rights violation.

Organizational closure and international practices

Thus far, my discussion of sovereignty’s self-production has been rather static. A physiological perspective tells us what elements of organization can explain how a system persists over time in changing contexts. Self-producing systems are organized in such a way that changes in their structure are subordinated to the goal of maintaining self-production. The concept of organizational closure captures this conservative orientation, through which the system maintains its autonomy vis-à-vis its environment.

I have suggested that sovereignty is autopoietic because it (re)produces, via exclusionary international practices, the state’s monopoly over meta-political authority. The monopoly on meta-political authority is both the source and

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528 Jackson 1999: 447; see also Zacher 2001.
product of sovereignty’s autopoiesis. Sovereign power is particularly powerful because it ultimately rests on itself.

The organizational closure of the system and the principles of differentiation which make up the structure of sovereignty are instantiated and reproduced in and through exclusionary ‘international practices.’ I adopt Emmanuel Adler and Vincent Pouliot’s definition of practices as ‘competent performances,’ but unlike them, I argue that an analytical distinction should be made between ‘international’ practices and other practices taking place in world politics. Adler and Pouliot define “international practices” as “socially organized activities that pertain to world politics, broadly construed.” I believe that we should distinguish ‘international’ practices, such as war and diplomacy, from other ‘global’ practices, such as humanitarian aid and democracy promotion. Borrowing from Ashley’s competence model of social action, I argue that the fundamental distinction between these practices lies in the fact that the competent performance of ‘international’ practices is restricted to the representatives of sovereign states.

International practices, thus, are practices taking place on a global scale in which the recognized representatives of sovereign states hold a shared monopoly over competent performance. While myriad actors, individuals, NGOs, and states, can legitimately participate in humanitarian aid and democracy promotion, only

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529 “Practices are socially meaningful patterns of action which, in being performed more or less competently, simultaneously embody, act out, and possibly reify background knowledge and discourse in and on the material world.” Adler and Pouliot 2011: 6.
agents authorized by sovereign states can wage war, for instance. The sovereign state’s monopoly over competent performance makes ‘international’ practices meaningfully different from other ‘global’ practices.

*International* practices contribute to the organization and reproduction of a particular global structure, an *inter-national* system in which states hold a privileged position of authority. Through sovereignty’s exclusionary practices, states collectively empower one another over non-state actors. These practices thus instantiate the state’s meta-political authority. Indeed, it is through modifications of sovereignty’s external and internal principles of differentiation, in and through exclusionary international practices, that the state system preserves its anarchic organization and its ability to continue to produce the state’s meta-political authority in the face of environmental challenges.

These practices have important consequences for the structure of world politics, since they are constitutive of the boundary between the international system and its environment. Indeed, the constraints and opportunities an individual faces are very different depending on whether she acts in the name of a recognized state or of an unrecognized organization like Hamas. As Ruggie points out, “the right to act as a power [or authority] is at least as important as an actor’s capability to force unwilling others to do its bidding”531

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De-Darwinizing the international system I: system cognition and immune reaction

In the second chapter, I have reconceptualized the contemporary international system as being in the midst of a transition from Darwinian population to Darwinian individual, or in other words, from structure to agent. I have discussed how METIs culminate with the emergence of de-Darwinization mechanisms that serve to mitigate Darwinian competition within the new individual, thereby displacing Darwinian selection pressures to the level of the interaction between the new individual and its own environment. In this last section, I tie the physiological perspective of the current chapter to the METI perspective of chapter 2 by describing these three de-Darwinization mechanisms as they manifest themselves in the case of the international system.

If the international system is a self-producing system, we should be able to find evidence of system-level cognition of its environment in the perceptions and behaviors of its parts. Indeed, one of the main ‘products’ of the organization of self-producing systems is the system’s unique perspective on its environment, in light of the survival requirements of the system, which are themselves defined as the maintenance of the capacity to self-produce. The system’s cognition of Self and environment is a key prerequisite for the kind of coordination necessary for collective agency. As Wendt notes, “in order to become an agent a structure must have three particular features: an ‘Idea’ of corporate agency and a decision
structure that both institutionalizes and authorizes collective action.”^32 Another crucial mechanism in the production of Self and environment is the immune system, which plays a key role in policing the boundaries of the system. In this section, I describe the international system’s emerging cognition and immune reaction.

In the case of the international system, this means that I expect to find the following kind of evidence. I expect to find evidence of system consciousness (cognition), or in other words that states share a common perception of the boundaries of the system vis-à-vis its environment and a shared understanding of the threats that the system faces. I also expect to find evidence that states increasingly define major threats not only as threats to themselves, but as threats to the system as a whole. Finally, I expect to find evidence of a collective intention to defend the system (immune reaction) against these security threats.

*System-environment cognition*

I have defined cognition in a self-producing system as the emergence of the system’s own perspective on its environment, in light of its survival requirements, which are defined, in the physiological perspective I have offered in chapter 3, as the maintenance of self-producing organization. Cognition of one’s environment is a prerequisite for (re)acting to and in this environment.

The related concepts of cognition and identity, as they pertain to the international system, have not travelled very far beyond the comfortable

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^32 Wendt 1999: 218.
boundaries of state individuality. To say that individual states exhibit cognition should be a relatively uncontroversial claim. James Scott has described how states ‘see’ their populations and territory, gaining knowledge about them in order to better control and exploit them.\textsuperscript{533} And in IR, we are familiar with how processes of state identity construction go hand in hand with the construction of images and representations of other states.\textsuperscript{534} While referring to individual state cognition is not particularly challenging, speaking of international system cognition, however, means navigating relatively unexplored territory.

When we think about state cognition and identity, we have tended to presuppose (implicitly, of course) the existence of an individual in the traditional sense described earlier: the state as organism. If the international system itself is an emergent individual, and more specifically a superorganism, however, there should be a corresponding shift in the level at which cognition works and in the form that it takes. States should increasingly construct their security in terms of the survival requirements of the system itself, and in the absence of a centralized decision-making structure, this cognitive process is likely to be ‘distributed.’\textsuperscript{535} Let me unpack each expectation in turn.

What do the security requirements of the international system itself look like? Keeping with the idea that the international system is a self-producing system, its most fundamental security requirement is the maintenance of its capacity to self-

\textsuperscript{533} Scott 1998.
\textsuperscript{535} Hutchins 1995; Knorr-Cetina 1995.
produce. In other words, before any other security needs can be met, the closed
network of self-production itself must be maintained. Self-production is life. As I
have argued earlier, for the international system this means that states must
preserve their shared monopoly over metapolitical authority, and this means the
exclusion of other kinds of actors from the decision on sovereignty.

What about decision-making in the international system superorganism? We
tend to think about cognition as centralized in a unitary decision-making center.
In the case of human cognition, we locate it in our brain. However, this neglects
how cognition actually works ‘in the wild.’

Indeed, except in the simplest unitary cells, cognition is always distributed. This is true even in cases like the human organism. When our pupils dilate when sensing a threat, for instance, they are not reacting to a threat to the eye itself (or to the pupil for that matter), but to the entire organism. The eye’s response is then coordinated with other parts of the body. One might say that decision-making in human beings is centralized in the brain, but while this may be the case, very often this process occurs without our being aware of it.

Granted, I have argued states remain like-organisms and an eye is not an individual organism, but a functional part of an organism. Still, I believe that we can make the same claim about state organisms. For the individual state too, as most theories of foreign policy tell us, cognition is distributed, if only among the different branches of its government.

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536 Hutchins 1995.
537 Polanyi 1958.
538 Allison 1971; analytical liberalism pictures the state as a transmission belt for societal interests. See Moravcsik 1997.
Friedberg’s study of British threat assessment in the early 1900s offers a good description of how far the threat assessment process can deviate from rational unitary actor assumptions. In the British case, which is generally seen as a case of relatively successful, rational adaptation to power decline, different state agencies used different indicators that at any given time only gave Britain’s key decision-makers a simplified and fragmentary picture of Britain’s security environment.539

The real challenge, however, when speaking of international system cognition, remains to conceive of it in the absence of any central decision-making structure. In the British case, threat perception might have been decentralized but the proverbial buck stopped somewhere. If Henry Kissinger had a hard time finding what phone number to dial when calling Europe, he would find the task even more difficult in the case of the international system. Interestingly, this is another area where the new biology opens our eyes to novel possibilities. Indeed, as I have already discussed, symbiotic superorganisms, such as macrotermes termite colonies, exhibit sophisticated forms of swarm cognition.540 Instead of using human cognition as a model, we should be looking for something like the swarm cognition of insect colonies, distributed amongst individual states.

So what does international system cognition look like? What should we look for? First, we should find evidence of system consciousness at the level of states and inter-governmental organizations. System consciousness, in the logic of self-

539 Friedberg 1988.
540 The challenge, in such cases, is to distinguish genuine system-level cognition from mere higher-level patterns that are the aggregate result of the intersection of lower-level individuals’ cognitions, a question that pits individualists’ “bottom-up” and holist’s “top-down” perspectives.
producing systems, constitutes a shared perception of the boundaries of the system vis-à-vis its environment and of the nature of environmental threats to the maintenance of autopoiesis, or the survival of the system.

Second, we should find evidence of immune reaction in the presence of a “collective intention” at the level of individual states to defend the system as a whole against environmental threats.\textsuperscript{541} Collective intentions are “joint commitments” between two or more actors to do something as a body. As such, as Jennifer Mitzen reminds us, they are more than ‘desires’; being a commitment, intending also has a “normative force” that mere desiring lacks. As Margaret Gilbert puts it, “if one violates a commitment to which one is subject, one has done what in some sense one was not supposed to do. One has to some extent and in some sense done something wrong – something open to criticism.”\textsuperscript{542} Since they push (through peer pressure) and pull (through a sense of obligation) groups to act in line with this commitment, collective intentions are constitutive of agency. The parties to a joint commitment, intending to act as a single body, thus constitute a “plural subject.”\textsuperscript{543} Since commitments require common knowledge, they tend to be communicated ‘in the open’ (unlike desires which until one or more actors commit to them often remain secret, hidden inside their heads). What is more, parties violating the commitment should feel compelled to justify their decision and we should find evidence of criticism from other

\textsuperscript{541} For an application of the concept of collective intentionality to the case of the Concert of Europe, see Mitzen 2013. While she is not the first to bring up the concept of collective intentionality (see Wendt 2004), her treatment of what it means to intend is the most extensive to date in IR.
\textsuperscript{542} Gilbert 2003: 47.
\textsuperscript{543} Ibid: 55.
members. Joint commitments thus tend to produce public evidence of their existence.

In the next pages, I tell the story of the emergence of international system cognition and immune reaction. First, I ask whether we can find evidence of system cognition and immune reaction – both system consciousness and collective intentionality – today. The picture this will give us is an admittedly limited and static one, a snapshot of international threat construction after 9/11. Second, to complement this picture, I go back in history and give a short account of the historical origins of these processes. I conclude with a discussion of what is different about the contemporary system.

*International system cognition and immune reaction today*

Looking at contemporary international politics, it is not difficult to discern both international system consciousness and a collective intention on the part of the collectivity of states to act on its behalf. Admittedly, while we should not expect to find statesmen explicitly saying that the self-production logic of sovereignty is under challenge and that states should cooperate and coordinate their actions to meet these challenges, some of the citations I will offer come close to saying just that. Today, mentions of threats to the state *as an institutional kind* and of the necessity for states to cooperate and coordinate over these threats are routine.

When it comes to threat perception, the primary focus of states today is on an interrelated, complex system of threats lying outside of the international system:
terrorism, the proliferation and accessibility of nuclear materials, radicalism, poverty, diseases, environmental disasters, global warming, etc. States continue to insist, in different degree, that although very unlikely, violent inter-state conflict is still a possibility, but the dominant representation of the inter-state realm of interaction, is not as a threat environment but as a realm of multilateral cooperation and coordination. Moreover, cooperation, integration and organization are increasingly seen as necessary in order to insulate the international system from complex security threats in its environment.

In the United Nations 2004 High-Level Panel on Threats, Challenges and Change, a group of experts was asked to describe the security challenges facing the UN system and how the UN should go about addressing those challenges. What is striking about this document is how close its language approaches that of the theory I have expounded earlier. The document (1) speaks of threats to the state system itself and to the state as an institution, not just to particular individual states; (2) it emphasizes threats from non-state sources and minimizes (without completely eliminating) the relative importance of conventional state-based threats; (3) it emphasizes the interconnectedness of the threats, which, interestingly, are less about discrete actors and more about complex systems; (4) it emphasizes states’ interdependence in the face of these threats and the necessity of further cooperation, integration and organization in response; (5) it emphasizes the obligations to the international community flowing from sovereign status within the international community; and finally, (6) it
emphasizes the need to strengthen states’ capacity to manage and control these risks. I have listed below the passages that exemplify these themes.

System cognition:

- The High-Level Panel defines threats to international security as “any event or process that leads to large-scale death or lessening of life chances and undermines States as the basic unit of the international system.”
- “The United Nations was created in 1945 above all else ‘to save succeeding generations from the scourge of war’ – to ensure that the horrors of the World Wars were never repeated. Sixty years later, we know all too well that the biggest security threats we face now, and in the decades ahead, go far beyond States waging aggressive war. They extent to poverty, infectious disease and environmental degradation; war and violence within States; the spread and possible use of nuclear, radiological, chemical and biological weapons; terrorism; and transnational organized crime. The threats are from non-State actors as well as States, and to human security as well as State security.”
- “Historians may well look back on the first years of the twenty-first century as a decisive moment in the human story. The different societies that make up the human family are today interconnected as never before. They face threats that no nation can hope to master by acting alone – and opportunities that can be much more hopefully exploited if all nations work together.”
- “Today’s threats to our security are all interconnected. We can no longer afford to see problems such as terrorism, or civil wars, or extreme poverty, in isolation. Our strategies must be comprehensive. Our institutions must overcome their narrow preoccupations and learn to work across the whole range of issues, in a concerted fashion.”
- “Today’s threats recognize no national boundaries, are connected, and must be addressed at the global and regional as well as national levels. No

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544 UN 2004: 2. Emphasis added.
545 Ibid: 1.
state, no matter how powerful, can by its own efforts alone make itself invulnerable to today’s threats.”548

Immune reaction:

- “Every State requires the cooperation of other States to make itself secure. It is in every State’s interest, accordingly, to cooperate with other States to address their most pressing threats, because doing so will maximize the chances of reciprocal cooperation to address its own threat priorities.”549

- “All States have an interest in forging a new comprehensive collective security system that will commit all of them to act cooperatively in the face of a broad array of threats.”550

- “Whatever perceptions may have prevailed when the Westphalian system first gave rise to the notion of State sovereignty, today it clearly carries with it the obligation of a State to protect the welfare of its own peoples and meet its obligations to the wider international community.”551

- “States are still the front-line responders to today’s threats. Successful international actions to battle poverty, fight infectious disease, stop transnational crime, rebuild after civil wars, reduce terrorism and halt the spread of dangerous materials all require capable, responsible States as partners. It follows that greater effort must be made to enhance the capacity of States to exercise their sovereignty responsibly. For all those in a position to help others build that capacity, it should be part of their responsibility to do so.”552

The international community’s collective reaction to the attacks of 9/11 is probably the best illustration of states’ shared representation of the terrorist threat and of their willingness to work together to eliminate the threat. Closely associated to the terrorist threat is the perceived threat of nuclear terrorism,
which Obama has called, in an important speech in Prague (2009), “the most immediate and extreme threat to global security.”

How and why does global terrorism threaten the state system? Or rather, if John Mueller and Mark Stewart are right that the objective threat from global terrorism is negligible and should be dealt with by private insurance companies,\textsuperscript{554} we should ask: why is global terrorism \textit{represented} as such an important threat to the international system? In the previous discussion I have argued that an autopoietic system will perceive as a threat the entities and processes that threaten to undermine its autopoiesis. I have further suggested that a modern immunological perspective points, not to what the entity is (if this was the case symbiotic associations would not be the norm among the living), but to what the entity does. This parallels the conclusion Raymond Cohen reached in his study of threat perception in international crises that

\begin{quote}
“the crucial inference, central to the appraisal of threat, is found in the recurrent argument that the opponent had in some way betrayed a trust or undertaken an illegitimate and impermissible action that he had somehow infringed a norm of behavior and that, as a consequence of this, he had ceased to be bound by existing restraints and was to be considered as bent on a policy of aggressive domination gravely damaging to the interests of the observing actor.”\textsuperscript{555}
\end{quote}

Terrorism, which involves the unauthorized use of violence by individuals or other non-state actors, threatens states’ claim to a monopoly on legitimate

\textsuperscript{553} White House 2009.  
\textsuperscript{554} Mueller and Stewart 2011. Also see Mueller 2006.  
\textsuperscript{555} Cohen 1979: 165.
violence and can undermine the state’s promise to protect its citizens. While the events of 9/11 put the issue in very stark terms and were ultimately sufficient to generate a comprehensive and overwhelming collective reaction from the international system, the threat global terrorism poses for the international system would become even clearer if terrorists were to ever hit a big city with nuclear weapons.

However, not all non-state actors with access to weapons are represented as a threat to the international system today, as the widespread use of private military companies in Iraq and Afghanistan illustrates.\(^{556}\) Indeed, states have partnered with the shipping industry and insurance companies in establishment of a High Risk Area, a “zone of exception” that has enabled “miraculously” high level of cooperation among states in the fight against piracy off the coast of Somalia.\(^{557}\) As Thomson has shown, there is a long history of interactions between states and non-state violence, a history that has culminated in the monopolization of the right to authorize violence by the state.\(^{558}\)

Even among terrorist groups, states seem to discriminate between terrorists one can talk to under certain conditions (like the IRA, the Basque ETA and the Taliban) and terrorists with whom negotiations would be futile and that can only be exterminated (like al-Qaeda and ISIS). The Supreme Court of the United States, in Holder vs. Humanitarian Law (2010), ruled that knowingly providing

\(^{556}\) Singer 2003; Avant 2005.  
\(^{557}\) Bueger 2015.  
\(^{558}\) Thomson 1996.
‘material support’ to, including talking to, any group designated as foreign terrorist organization (FTO) constitutes a federal crime.\textsuperscript{559} In making this judgment, the Supreme Court inscribed in US law a powerful taboo against negotiating with terrorists that has been guiding U.S. policy towards terrorism for decades. The taboo is so powerful that Stephen Walt made ‘Thou shall not favor negotiating with ‘terrorists” the tenth of his ‘Ten Commandments for ambitious policy wonks,’ in which he listed what he took to be the most controversial policies career-savvy policymakers would be wise to stay clear from.\textsuperscript{560} The dominant discourse on Al-Qaeda (and ISIS today) has been that it was a foe with which one cannot negotiate and therefore, one that can only be killed or jailed.\textsuperscript{561} In a statement that echoed countless other similar ones, George W. Bush stated that “The only way to deal with these people (the terrorists) is to bring them to justice. You can’t talk to them. You can’t negotiate with them.”\textsuperscript{562} The 9/11 Commission concurred: “[Al-Qaeda’s position] is not a position with which Americans can bargain or negotiate. With it, there is no common ground – not even respect for life – on which to begin a dialogue. It can only be destroyed or utterly isolated.”\textsuperscript{563} President’s Obama’s counter-terrorism strategy has continued this policy, expanding its reach with the extensive use of killer drones. While pronouncements by American officials stating the impossibility of negotiating with terrorists abound, I could not find a single statement by an

\textsuperscript{559} Supreme Court 2009.  
\textsuperscript{560} Walt 2009.  
\textsuperscript{561} On the distinction between enemies and foes, see Prozorov 2006.  
\textsuperscript{562} Bush 2011.  
\textsuperscript{563} 9/11 Commission 2004.
active U.S. official in which the possibility of negotiating with Al-Qaeda is explicitly or implicitly entertained.

Meanwhile, however, we know that historically, most conflicts opposing states to terrorist organizations – France-FLN, UK-IRA, Spain-ETA, Israel-PLO, and South Africa-ANC conflicts, to mention a few examples – have been brought to an end via de-escalation processes that involved some form of negotiations.\textsuperscript{564} While many arguments have been advanced for why states will not entertain treating al-Qaeda like a normal belligerent, notably its decentralized structure,\textsuperscript{565} what seems to distinguish the former from the latter is that states practice a distinction between terrorist groups that accept the sovereign state system (separatist movements seek to become states and therefore are compatible with its self-producing organization) and those who reject it, such as al-Qaeda and ISIS, with their project of establishing a new caliphate.

In his study of the international society’s reaction to global jihadism, Barak Mendelsohn thus notes a fundamental change in how the international society treated terrorism after 9/11.

“Terrorism was on the international agenda prior to September 2001, but it was perceived as neither an urgent problem nor a collective one.... Rather than viewing terrorism as a threatening phenomenon that requires comprehensive collective treatment, states tended to identify as terrorism only the threats and their close allies.... Even when states did consider terrorism as a phenomenon, their divergent views on what constituted terrorism

\textsuperscript{564} Toros 2008. 
\textsuperscript{565} Wilkinson 2006.
and who could be considered a terrorist, as well as on its causes and how best to confront it, obstructed any meaningful, broadly collaborative action.\(^{566}\)

The key obstacle to greater collaboration among states over terrorism, before 9/11, he argues, was the lack of agreement on a common definition. After 9/11 revealed its destructive potential, statesmen increasingly framed, often very explicitly, global terrorism as a systemic threat. “Although statesmen rarely use the same terminology as scholars, precluding the use of ‘systemic threat’ to characterize the al Qaeda network,” Mendelsohn notes, “states’ reactions indicated their recognition that the jihadi threat was not limited to the United States or to a mere rejection of its policies; they perceived the threat as being directed at the international society and the fundamental elements of order.”\(^{567}\)

The international society’s coordinated response and its efforts to “bolster” states’ capacity to identify and combat terrorists can be seen as an immune reaction aimed at preserving the international system core organization, which non-state violence coupled with its unprecedented destructive potential today is increasingly represented as significantly threatening.

The Global War on Terror offers clear evidence of the existence of a collective intention on the part of almost all states to deal with terrorism and associated threats, as evidenced by the United Nations Security Council Resolutions 1373 and in the massive support to international antiterrorism conventions. In Resolution 1373, adopted in the weeks following 9/11, the Security Council notes

\(^{566}\) Mendelsohn 2009: 90.

\(^{567}\) Ibid: 92.
“with concern the close connection between international terrorism and transnational organized crime, illicit drugs, money-laundering, illegal arms-trafficking, and illegal movement of nuclear, chemical, biological and other potentially deadly materials, and in this regard emphasizes the need to enhance coordination of efforts on national, subregional and international levels in order to strengthen a global response to this serious challenge and threat to international security.”\textsuperscript{568}

Resolution 1373 is an explicit statement of the international system’s collective intention to fight terrorism. It explicitly affirms the responsibilities and obligations of all states in the face of the terrorist threat, making states individually responsible for working to suppress terrorist activities in their territory and calling for them to exchange information, cooperate and coordinate their actions to suppress terrorism. The call to exchange information on individuals has acquired the status of an international “norm”, which Jason Keiber labels the “international surveillance norm.” The emerging norm prescribes that “states ought to (a) share information with international partners, and (b) have the domestic capacity to accomplish that sharing, and generally keep a cap on potential threats at home.”\textsuperscript{569} This norm has become particularly important in constituting the international system’s cognition of its environment as it pertains to the terrorist threat.

System cognition of the threat environment, notably over terrorism and securing nuclear materials, has become increasingly institutionalized. A key condition for the formation of a strong collective intention to fight global terrorism was the

\textsuperscript{568} UN Security Council 2001: 3.
\textsuperscript{569} Keiber 2014: 174.
formation the Counter-Terrorism Committee (CTC), whose work has consisted in monitoring countries’ progress on the shared anti-terrorist agenda, notably the ratification and implementation of international anti-terrorism conventions, technical assistance, the sharing of information and best practices, and offering a forum for the coordination of policies.570 Another indicator of states’ overwhelming commitment to the fight against terrorism is the fact that a great majority of states have become parties to the 13 international conventions against terrorism, the latest one being the Nuclear Terrorism Convention (summarized in table 4.1).

570 CTC 2016.
Another notable aspect of the international fight against global terrorism is that states have preferred to work together and through IGOs, shunning the kinds of NGO involvement that we increasingly witness in other areas of global

571 International Maritime Organization 2016.
governance. Indeed, contemporary global governance structures do not only include states and inter-governmental organizations but increasingly incorporate non-governmental organizations. The same phenomenon is observed in global security governance, with non-state actors (e.g. private military firms) playing an increased role in state-led military operations. While states actively cooperate to combat various sorts of violent non-state actors, such as pirates, transnational criminal networks, or terrorist organizations, they also increasingly collaborate and even sometimes delegate governance tasks to other kinds of non-state actors, such as private military and security companies (PMSCs).

While in other issue areas the international system increasingly takes the form of a complex symbiotic association, however, when it comes to global terrorism, which is seen as a threat to the international system, the fight has been driven by states and inter-governmental organizations (IGOs). The most central IGO has been the UN which has been at the center of the fight on terrorism, but most other major IGOs – the European Union, the African Union, the Organization of American States, the Asia-Pacific Economic Cooperation, the G8 and the Organization for Security and Co-Operation in Europe – have also adopted counter-terrorist measures. “Despite the UN’s limitations, states have acknowledged the institution as an indispensable actor in the war on the jihadi terror and have selected it as the primary institution to legitimize and direct the

Non-state actors and organizations (NGOs) have little involvement in the fight against terrorism. As Mendelsohn notes, “NGOs play a very small role in the struggle with the jihadis. They maintain a high profile mainly on human rights issues, attempting to reduce the danger of human rights abuses taking place under the guise of the war on terrorism. Naturally, this focus often puts NGOs in direct opposition to states’ actions.”

_Historical origins_

I have suggested that states’ reactions to global terrorism since 9/11 is evidence of their increasing awareness that they constitute an interdependent whole from a security standpoint (cognition) and that they accordingly share an interest in tackling, collectively, this perceived threat to the system. I have further shown evidence of states collective intention to do so (immune reaction). But where can we locate the emergence of system consciousness historically? Is there evidence of earlier forms of collective intentionality on the part of states?

If we take only the first criterion into account – evidence of the awareness that the system constitutes a whole distinct from its environment – then we can actually trace the idea of the international system individual very far back into European history, with the idea of Christendom and, later, Europe. If we look at the second criterion – collective intentionality – however, we do not find evidence of a collective commitment to the defense of the system itself until the years immediately leading to the Congress of Vienna (1815).

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574 Mendelsohn 2009: 106.
Indeed, it could be argued, but admittedly only a very weak sense, that from a cognitive perspective, the potential for individuality was present in the earliest stages of the international system. At Westphalia, interdependence and the interests of Christendom were recognized and led to the mutual recognition of states’ sovereignty. Indeed, the mutual recognition of sovereignty itself implies the recognition of community. At the end of the 17th century, for instance, the French theologian François Fénelon described “Christendom” as

“a kind of general republic, with common interests, common fears and common precautions to be observed. All the members of this great body owe it to themselves to prevent all progress by any of them which would upset the balance and lead to the inevitable ruin of the other members of the same body.”576

In the congresses leading to the Peace of Westphalia (1648), however, there was little integration beyond the common attachment to Christianity. The main source of order was tradition and custom, not mutually agreed upon principles about the system. It was only at Utrecht (1712) and in subsequent treaties, that the more secular notion of Europe succeeded Christianity as the new entity and that the idea of the international system emerged as an abstract program of governance. There, as Osiander puts it, the international system became conceived of as a kind of “imaginary super-actor with the same aspirations as the individual actors that made it up.”577 The European system was conceptualized as having “interests,” among which were “repose” and “tranquility.” In the same

576 Cited in Hinsley 1963: 159.
vein, states showed a sense of solidarity by routinely referring to each other as ‘brothers’ and ‘sisters.’

While scholars agree on the emergence of system consciousness around the time of Utrecht, they disagree about the extent to which there was a genuine commitment to subordinate state interest to the interests of the whole system. Edward Gulick argues that the practice of the balance of power implied a shared conception of the system and suggests that European statesmen during this period exhibited “a kind of advantageous group-consciousness” that “meant a uniformity of assumptions which in turn facilitated the perpetuation of a balance of power.”

“Most of the prominent thinkers on this subject, down through the nineteenth century,” Gulick argues, “accepted the initial fact of the state system and the desirability of sovereignty and independence for the member states.” Osiander concurs, and argues that as early as Utrecht, “public’ aspirations – pursued on behalf of the system as a whole – were more legitimate, that is, likely to engender international consensus, than mere ‘private’ ones. ‘Private’ aspirations were only legitimate if they were compatible with the ‘public’ interest.”

“The preservation of the system, and the defense of its ‘repose’ against disruption,” he argues, “were an acknowledged official aim of the European actors.” He gives the example of the Viscount of Bolingbroke, who as leading British negotiator at Utrecht (1713) routinely referred to notions such

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580 Ibid: 50.
582 Ibid: 114.
as “political system of Europe,’ the ‘general system’ or the ‘general system of
tpower in Europe,’ the ‘constitution of Europe,’ the ‘common cause of Europe,’
and the ‘general interest of Europe’.”583 The fact that individual states identified
the interests of the international system with their own self-interest nonetheless
reflected “an awareness that individual goals were being achieved through a
collective effort, and could therefore be treated as if the goals themselves were
collective.”584

The idea that European states are interdependent from a security perspective and
that states should commit to the preservation of the balance of power for the sake
of the whole and their own was further elaborated in the second half of the 18th
century in the writings of Montesquieu, Voltaire, Jean-Jacques Rousseau and
Emmerich de Vattel. Montesquieu for instance described Europe as “a single
state composed of several provinces” where “all the states depend on each
other.”585 Similarly, in 1751 Voltaire wrote that “Christian Europe” was “a sort of
great republic divided into several states” that were “above all ... at one in the
wise policy of maintaining among themselves as far as possible an equal balance
of power.”586 In the words of international legal scholar Vattel, “Europe forms a
political system in which the nations inhabiting this part of the world are bound
together by their relations and various interests into a single body. It is no longer,
as in former times, a confused heap of detached parts, each of which had but little

583 Ibid: 110.
584 Ibid: 121.
585 Hinsley 1963: 162.
concern for the lot of the others.” He thus saw “Modern Europe” as “a sort of republic, whose members – each independent, but all bound together by a common interest – unite for the maintenance of order and the preservation of liberty.”

In Hinsley’s view, however, statements such as the ones I have cited above actually represent aspirations rather than reflections on political reality: these various early ‘system’ thinkers, he argues, were actually rebelling against the actual, selfish practices of statesmen at the time. It is often noted, in support of the idea that private interests were subordinated to public interests that, while wars were endemic in this period, they were also limited. But whatever restraints there were, Hinsley points out, were the product of material constraints (notably logistical). It is only after the disaster of the Napoleonic wars, in his view, that statesmen and political theorists became one in thinking collectively about the European states system as anything approaching a ‘plural subject.’ While he sees system-consciousness emerging at Utrecht, Osiander concurs with Hinsley that common principles actually became significantly more abstract and self-conscious at Vienna.

I am not in a position to make a definitive historical judgment here. However, we can probably safely say that before the Napoleonic wars, European states exhibited a clear sense of system consciousness which was represented by

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587 Ibid: 166.  
588 Hinsley 1963.  
589 See Mitzen 2013.  
590 Osiander 1994.
balance of power thinking, but that the system was viewed as self-perpetuating and the balance of power as what Inis Claude calls “automatic” (as opposed to “manual”) and not requiring joint commitment and the formation of a permanent forum.\textsuperscript{591} The repeated failures to balance Napoleon, however, changed that and demonstrated the need for a greater unity of purpose and commitment. As Paul Schroeder puts it, European Great Powers “were forced into systemic thinking by repeated failures, the exhaustion of alternatives, their inability to make any form of the old politics or any combination of the old and the new politics work—and finally, by the ruthless imperialism of [Napoleon].”\textsuperscript{592} “Napoleon,” Hinsley suggests, “was brought low by a coalition of Powers who formally assumed, for the first time, the status of Great Powers and proceeded to govern Europe by a Congress.”\textsuperscript{593} Hinsley further notes that

“the impressive thing about the behavior of the Powers in 1815 is that they were prepared, as they had never previously been prepared, to waive their individual interest in the pursuit of an international system. This fact is not rendered any less impressive by the recognition that they were prepared to waive their individual interests because it was in their individual interests to do so. They had recognized for the first time that it was in their individual interest to do so.”\textsuperscript{594}

By the time of the Congress of Vienna, the survival of the system had become a primary goal of European states. The assumption was that “the best way to preserve the individual state was to preserve the system of which it was a part.”

\textsuperscript{591} Claude 1964.  
\textsuperscript{592} Schroeder 1996: 68.  
\textsuperscript{593} Hinsley 1963: 155.  
\textsuperscript{594} Ibid: 197.
In other words, “Self-interest ... could best be pursued by attention to group interest. By preserving the state system you would reserve the parts thereof.”595

Watson agrees:

“All shared an interest in the successful operation of the new concert. Raison de systeme does not exclude conflicts of interest; it is the recognition that the advantage of all the parties is to resolve such conflicts within the framework of the system and, as the architects of the Vienna settlement saw it, according to the rules and codes of conduct of their revised international society.”596

These interpretations echo the experience of the makers of the Congress system, as evidenced by Austria’s foreign minister, Prince Klemens von Metternich’s observation that:

“Politics is the science of the vital interests of States in its widest meaning. Since, however, an isolated state no longer exists, and is found only in the annals of the heathen world ... we must always view the society of states as the essential condition of the modern world... What characterizes the modern world and distinguishes it from the ancient is the tendency of states to draw near each other and to form a kind of social body based on the same principle as human society .... In the ancient world isolation and the practice of the most absolute selfishness without other restraint than that of prudence was the sum of politics.... Modern society on the other hand exhibits the application of the principle of solidarity and of the balance of power between states .... The establishment of international relations, on the basis of reciprocity under the guarantee of respect for acquired rights, ... constitute in our time the essence of politics.”597

Similarly, at the time, Metternich’s assistant, and Secretary of the Congress of Vienna, Friedrich von Gentz described this collective intention to act on the

behalf of the European system as a “preliminary effort to work for a political system to consolidate and uphold the public order in Europe.” The Congress system, he observed, was a

“phenomenon unheard of in the history of the world. The principle of equilibrium or, rather, of counterweights formed by particular alliances – the principle which has governed, and too often troubled and engulfed, Europe for three centuries – has been succeeded by a principle of general union, uniting all the states by a federative bond under the direction of the 5 principal Powers.... The states of the second, third and fourth rank have placed themselves, tacitly and without any stipulation on this point, under the decisions taken jointly by the preponderant Powers; and Europe at last forms a single great political family, reunited under an areopagus of its own creation, in which the members guarantee to each other and to each interested party the tranquil enjoyment of their respective rights.”

In her recent book on collective intentionality in the Concert of Europe, Jennifer Mitzen has gone farther than anyone in showing how collective intentions can be sustained by the constraining effects of the emergence of an international public sphere through the practice of Concert diplomacy. She shows that the key mechanism was the formation of the Congress system and the forum effects it produced. In public forums, participants must frame their own interests in terms of the interests of the whole. They must also give reasons to support their positions and in doing so they must rely on commonly accepted discourses. The result is that “speakers (now) see themselves as acting less as ‘selves’ than as ‘members’ of a group.” Finally, they will tend to exhibit self-restraint and

598 Cited in Hinsley 1963: 197.
behave in accordance with their commitments. Absent the regular meetings of the Concert of Europe, previous balance of power practices probably could not amount to a collective intention to act on behalf of the system as a whole.

At Vienna (1815), European statesmen recognized two threats to the international system: not just, as formerly was the case, threats from within, namely the threat coming from a powerful (revolutionary) state seeking to overturn the status quo, but also threats from below, from revolutionary movements in society. For the first time, the international system was seen as something distinct from its environment and managed in light of its own position in a threatening environment. European states could not fall back into another major war because, given the prospect of revolution, this would mean the end of the system itself.

While most of the scholarly attention is on the hundred years or so between Utrecht (1712) and Vienna (1815), Anthony Giddens’ argument about the growth of a “reflexive monitoring of a world-wide system if states”\textsuperscript{600} in the century between Vienna and Versailles (1919) offers an alternative thesis on the emergence of system cognition. Giddens’ account differs from the preceding discussion in the sense that he finds evidence of system cognition not in collective intentions to defend the system, but rather in the universalization of the sovereign state as a mode of political organization. Giddens argues that the growth of international organizations aimed at solving ‘international’ and now

\textsuperscript{600} Giddens 1985: ch. 10.
‘global’ problems reflects the emergence of system-consciousness and is simultaneously constitutive of it. The development of system consciousness, in his view, went hand in hand with the expansion of the state system, the problem of determining the borders of new states, and the growth of international organizations to administer these problems.

- “The development of a plurality of nations is basic to the centralization and administrative expansion of state domination internally, since the fixing of borders depends upon the reflexive ordering of a state system.”\textsuperscript{601}
- “Both the consolidation of the sovereignty of the state and the universalism of the nation-state are brought about through the expanded range of surveillance operations permitting ‘international relations’ to be carried on. ‘International relations’ are not connections set up between pre-established states, which could maintain their sovereign power without them: they are the basis upon which the nation-state exists at all. The period of the burgeoning of international organizations, including the League of Nations and the UN, is not one of the growing transcendence of the nation-state. It is one in which the universal scope of the nation-state was established.”\textsuperscript{602}
- “Without the UN and a host of other inter-governmental organizations the nation-state would not be the global form of political ordering that it has become.”\textsuperscript{603}

Giddens’ argument brings me to a second set of mechanisms – reproduction – which I will describe in the next section in the context of state creation and state recognition.

\textsuperscript{601}Ibid: 119.
\textsuperscript{602}Ibid: 263-64.
\textsuperscript{603}Ibid: 291.
De-Darwinizing the international system II: Reproduction

The control of reproduction is the other key de-Darwinizing mechanism in a superorganism. In many social insect colonies, as I have discussed earlier, reproduction is centralized around the queen and this division of labor is socially enforced. The organization of reproduction at the colony-level serves to constrain independent reproduction by the workers, precludes the colony from devolving into Darwinian competition and enables collective action for the sake of the colony. By mitigating Darwinian competitive pressures at the lower level and displacing them to the colony level, the control of reproduction plays a major role in METIs. Thus, in insect colonies, reproduction is centralized in practice, despite the fact that individual workers generally retain the capacity to reproduce. In these respects, I will argue, the organization of reproduction in the contemporary international system, with its concentration in the hands of the Great Powers and increasingly, the United Nations, is similar to the organization of reproduction in an insect colony.

Reproduction in and of the international system

What does the reproduction regime look like in the international system? In a superorganism, decentralized sexual reproduction is threatening to the superorganism, since it presents the risk of a descent back into Darwinian competition. For instance, in the case of termite *Macrotermes* colonies discussed earlier, from the vantage point of natural selection, the relevant unit is the whole symbiotic superorganism, but we cannot say that the superorganism itself
reproduces. Under what understanding of reproduction can we say that an intricate pile of mud reproduces?604

As a result of the difficulty of making sense of reproduction in many cases of superorganisms and symbiotic associations, some biologists and philosophers have sought an alternative conception of fitness. In chapter 2 I have suggested using differential persistence. I want to argue that this conception of fitness remains perfectly consistent with Darwinism, while holding the additional advantage of being applicable to these difficult biological cases and, most importantly for my purposes, to a social system like the international system.

What does persistence have to do with reproduction? To make sense of this, let us go back to the concept of fitness in evolution. Recall that the reason fitness has come to be understood as reproduction is that reproduction increases the chances that genes will be passed on to the next generation. Survival enables an individual to reproduce, yes, but reproduction is really about survival, albeit the survival of a different unit, the gene. By taking reproduction to be about persistence, we are going back to this key notion. Instead of emphasizing the reproduction aspect of the definition of fitness, we emphasize its survival aspect, which is interpreted in terms of persistence over time.605 In one sense, thus, fitness as reproduction was always about persistence. From an evolutionary standpoint, reproduction matters because it enables genes (and more specifically the information they carry) to be transmitted across generations.

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604 For elaborate discussion, see Turner 2013.
Seeing biological reproduction as persistence helps us cross the bridge to social reproduction, which is also really about persistence. When we talk about reproduction in a social context, as in the reproduction of a social structure, practice, or identity, for instance, we are really thinking about that social construct’s capacity to persist across time and space (and not about its ability to generate new constructs by combining itself with another). When we think about the reproduction of the state, we think about its continuous recognition by society and other states. And when we think about the reproduction of the international system, we think about the persistence of its organization, based on the mutual recognition of sovereignty within the closed network of already recognized sovereign states. Hence, reproduction-as-persistence in the international system is really about recognition.

State creation and recognition today

Like is the case in insect colonies, state creation and recognition in the international system is highly centralized in practice, even if in fact each state retains the capacity to create/recognize states. Scholars have noted a shift in the practice of state creation and recognition, which has become increasingly international. Whereas individual states used to have the capacity to independently create and legitimate new states, coordinated recognition, by the
great powers, following recognized, abstract principles is how the practice works today.606

The Great Powers play the largest role in the process of state recognition. “All states are both members and progenitors of the system, but the Great Powers’ recognition decisions are the most important.... Often prime movers in crises of state birth, Great Power recognition serves as a focal point for others to follow, initiating a cascade of system-wide legitimacy.”607 What is more, Bridget Coggins persuasively argues that, for a number of considerations, the Great Powers have a shared interest in coordination over questions of state recognition. The Great Powers, she writes, “ought to prefer coordinated recognition to maintain their social standing and security; to maintain international stability; and to reproduce the state-centric international order.”608 Her empirical test of this hypothesis yielded the strongest results in her study: “When one or more Great Power granted recognition, the risk of additional Great Power recognition increased between twenty-eight (post-1945) and thirty times (1931–2000).”609 Secessionists, she concludes, need “friends in high places.” The decision to recognize or not belongs to the all states, but leadership belongs to the Great Powers, as a collective.

“When one or more Great Power granted recognition, the risk of additional Great Power recognition increased between twenty-eight (post-1945) and thirty times (1931–2000).... The Great Powers do

608 Coggins 2011: 452.
609 Ibid: 461.
not make their recognition decisions in a vacuum; even where their parochial interests align in favor of a particular new member, coordination helps to ensure that state emergence occurs in an orderly, predictable, and minimally disruptive manner—at least insofar as the Great Powers themselves are concerned.”

In this respect, the practice of recognition in the contemporary system directly challenges Waltz’s assertion that the international system is functionally undifferentiated; there clearly is a division of labor when it comes to state creation and recognition.

Where does this shift towards more centralized division of reproductive function begin? Fabry locates it in the Congress of Vienna (1815). There, the legitimacy of the 20 some satellite states (see table 3.4 below) created by Napoleonic France during 22 years of war was rejected and the status quo ante bellum restored. Between 1792 and 1814, as Fabry puts it,

“France conferred on itself the right to decide how, when, and by what means other peoples would become free – under which leaders, under what constitution, and in what jurisdiction…. Napoleon’s domination of Europe introduced a new phenomenon of satellite or puppet states: entities whose founding and any continued empirical existence are a direct result of a prior threat or use of force by a foreign power.”

To go back to the biological examples I have discussed earlier, from the vantage point of the international system superorganism, Napoleonic France behaved like a cancerous tumor, reproducing independently at a rate that threatened the integrity of the system. Indeed, Napoleonic France’s creation of a host of new

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611 Fabry 2010: 37.
states provides an interesting illustration of a (counterfactual) world in which each state create and recognize entities as far as it judges expedient to do so. It illustrates nicely what the process of state creation would look like if the international system was a Darwinian environment in which reproduction (state creation) is the prerogative of each state.

<table>
<thead>
<tr>
<th>Table 4.2 – Satellite states of Revolutionary France, 1792-1814⁶¹²</th>
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<tr>
<td>The Rauracian Republic (1792-3)</td>
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<tr>
<td>The Batavian Republic (1795-1806)</td>
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<td>The Transpadan Republic (1796-8)</td>
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<td>The Lombardian Republic (1797-8)</td>
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<td>The Ligurian Republic (1797-1805)</td>
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<td>The Anconitan Republic (1797-8)</td>
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<td>The Helvetic Republic (1798-1803)</td>
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<td>The Lemanic Republic (1798-1803)</td>
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<td>The Piedmontese Republic (1798-9)</td>
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<td>The Roman Republic (1798-9)</td>
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<td>The Cisalpine Republic (1798-9, 1800-2)</td>
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<td>The Parthenopean Republic (January-June 1799)</td>
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<td>The Kingdom of Ertruria (1800-8)</td>
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<td>The Republic of Valais (1802-10)</td>
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<td>The Kingdom of Italy (1805-13)</td>
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<td>The Confederation of the Rhine (1806-13)</td>
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<td>The Kingdom of Holland (1806-10)</td>
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<td>The Kingdom of Westphalia (1807-14)</td>
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<td>The Grand Duchy of Warsaw (1807-14)</td>
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<td>The Illyrian Republic (1809-13)</td>
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</table>

⁶¹² Ibid: 38.
The Concert of Europe that was founded in response, on the other hand, effected a centralization of the practice of state recognition and the adoption in practice of external, abstract recognition criteria. This was achieved, Osiander suggests, through the creation of the Great Power status, the definition of the Great Powers’ responsibilities as manager of the system, as well as the emphasis on monarchical legitimation principles. The “tacit legitimation of their special status required that the great powers understood themselves to be answerable to the other actors, as well as to one another, and that they conducted themselves accordingly.”613

“What came into play (at the Congress of Vienna) was an important rule flowing from the great-power principle, and which would be called the rule of coordination. A joint hegemony exercised in the name of the great power principle would work only if a minimum of coordination was preserved between the actors sharing that hegemony. At the same time, the higher the stakes, the greater the degree of coordination required. In other words, the more responsibility the privileged actors had, the more they depended on maintaining agreement between them.”614

Osiander thus concludes that “the Congress of Vienna saw the introduction of a two-tier set up into the international system” in which “the five biggest actors in the system formed a kind of managing committee and invested themselves with the responsibility for maintaining international stability.”615

The shift to Great Power Concert, and later, to the UN System, can be seen as a progressive shift towards greater division and centralization of reproduction in

615 Ibid: 322.
the system. Since the Vienna settlement, individual states’ ability to reproduce on their own has been increasingly limited. From the Congress of Vienna onwards, the ‘Great Powers’ have collectively decided which polities would be recognized as members of the international system. When doing so, the Great Powers have generally referred to accepted principles, from the balance of power and monarchical principles to, more recently, self-determination, territorial sovereignty and the R2P. Before Vienna, however, no abstract principles were followed in practice when determining membership in the system. Membership was de facto.

“There was no abstract criterion for membership of the international system of Europe before the early nineteenth century. Both at Munster and Osnabruck and at Utrecht, membership of the system was on a de facto basis. Adherence to some type of Christianity was, indeed, a necessary prerequisite for membership, but it could not determine the identity of the actors. There were no consensus notions on which potential international actors wishing to assert themselves could have relied to boost their cause. New actors could come into being only by means of determined military insurrection. It did not even matter whether actors were trying to establish themselves for the first time, or whether they had already enjoyed autonomous status in the past. The Swiss and the Dutch, who had not been independent before, had to engage in fierce and protracted struggles (in the late Middle Ages and in the sixteenth and seventeenth centuries respectively) in order to shake off Habsburg rule and assert themselves as international actors in their own right. (They did this despite the fact that, in both cases, it had not even been their original intention.) But even Sweden in the sixteenth century and Portugal in the seventeenth century only regained their independence (from Denmark and from Spain respectively) through purely military means. All four bids for
membership in the international system were unassisted by any consensus notions operating at system level.”

Non-recognition of aggressive gains

In a world where the territorial state covers the whole surface of the globe, independent state creation would have to take place through conquest or partition. For a long time, this was normal practice. Inter-state wars were routine and would lead to territorial redistribution. Often times, this would lead to the creation of new states. Today, however, this possibility is limited by a strong norm against the recognition of conquest.

In a speech in the Landtag in 1869, German Chancellor Otto von Bismarck rejected a Polish deputy’s demand for greater recognition of Polish rights in the following terms: “Gentlemen, if you contest the right of conquest, you cannot have read the history of your own country. It is thus that states are formed... The Poles themselves committed the crime of conquest a hundredfold.” For most of international history, Bismarck’s statement was a correct description of the process of state creation. Until the time of the Congress of Vienna, and the restoration that followed it, states could conquer a territory, create a new state out of that territory, and expect other states to recognize the newly created entity. As Tilly succinctly put it, “war made the state and the state made war.”

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615 Ibid: 317.
the perspective of contemporary international politics, however, Bismarck’s statement appears remarkably anachronistic.

In today’s international system, a norm of nonrecognition of aggressive gains has emerged and taken a deep hold over international practice. It was first invoked in 1932 when US Secretary of State Henry Stimson, citing the Kellogg-Briand Pact, sought to deny Japan’s right to create Manchukuo out of its military conquest of Chinese Manchuria. The League of Nations followed by adding a provision to Article 10 stating that aggressive gains would not be recognized, which led Japan to withdraw from the League of Nations. Of course, this emerging norm was thoroughly violated during World War II. Following the end of the war, however, states have adopted and practiced the doctrine of non-recognition of aggressive gains, or Stimson Doctrine. “Over the course of the twentieth century,” Joseph O’Mahoney argues,

“the rules of international behavior changed from a system in which the victors in a war had the authority to dispose of territory or other concessions as they wished, to a new system in which conquest, and the fact that there was an inequality of power between the victors and the vanquished, had no legitimate impact on the final shape of the settlement.” 619 This is a sharp departure from hundreds of years of international history, but it goes hand in hand with other phenomena I have been discussing in this dissertation, such as consolidation of territorial integrity norms. 620

Today, the norm has, as Turns note, “acquired the force of customary international and treaty law, through its adoption by the League of Nations and,
in the post-World War II period, the Charter and practice of the United Nations.” Unilateral secession too has come to be seen as illegitimate. As Fabry argues, “the latest and still unsettled cases of recognition of Kosovo by roughly one-third of UN member states and of Abkhazia and South Ossetia by Russia, Nicaragua, and Venezuela have not changed this basic picture.”

**Locating the international system in Darwinian space**

The three de-Darwinization mechanisms – cognition, immune reaction, and reproduction – are represented as a Darwinian space in figure 4.2 below. Values that approach 0 mean that the mechanism operates at the level of lower-level individuals. Values that approach 1 mean that the mechanism operates at the level of the system. Point (0,0,0) is a Darwinian population. The international system depicted by Neorealists belongs to that point. Point (1,1,1) is a fully de-Darwinized individual. Depending on the direction of the historical trend observed, all other points represent intermediate stages in the de-Darwinization of a Darwinian population.

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Where is the international system in Darwinian space? From the discussion in this chapter, it has clearly progressed towards the 1 value on all three axes. If our understanding of the (1, 1, 1) point is the single organism (i.e. the world state), we should conclude that the international system remains (nominally of course) half-way there, but if our understanding of the (1, 1, 1) point is the superorganism, however, the international system is almost if not already there. Indeed, as my discussion makes clear, the contemporary international system exhibits signs that it has evolved all three de-Darwinization mechanisms: cognition, immune reaction, and the control of reproduction. In this chapter I concluded that the first time that we witness progress on all three processes was at the Congress of Vienna (1815). There states exhibited system-environment distinction and there was also a commitment to intervene on behalf of the system (immune reaction), not only to prevent the reemergence of a threat to the balance

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623 Adapted from Godfrey-Smith 2009.
of power, but also to prevent social revolution and enable coordinated response to unrest in any part of the system. At the level of state creation and recognition (reproduction), the international practice became centralized in the Great Powers and for the first time followed well-defined, abstract principles, in occurrence monarchic principles.
Part C

Development

Introduction
In this final part of the dissertation, I return to the issue of international system transformation in the globalization era. After defining the problem in the introduction, I suggested that the Darwinian evolutionary perspective on the question, the dominant frame through which the question has been approached, is arguably the most important obstacle to an understanding of the contemporary status and future of the international system under globalization.

In the previous chapters I have challenged this ontology of the contemporary international system via evolutionary and physiological perspectives from modern biological theory. In chapter 2, I proposed an alternative account of the evolutionary origins of the contemporary international system. There I suggested that the international system is in the midst of a Major Evolutionary Transition to Individuality (METI). I argued that the contemporary international system meets all of the criteria for emerging evolutionary individuality and concluded that, at

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least from a modern evolutionary standpoint, the international structure is becoming an agent, and concluded that this transformation should have important consequences for international politics and IR theory.

In Part B I pushed this argument further and, assuming that the emerging international system individual is a superorganism, I applied a physiological approach, the theory of self-producing system, to a description of its emerging organization and structure. There, I suggested that the organization of sovereignty at the international level constitutes the contemporary international system as a closed network of self-production of metapolitical authority. I have argued that sovereignty ultimately rests on itself and that the autonomy it gains from this organization makes it particularly resilient and more likely to maintain itself on the tracks of individuality.

In the next two chapters, I push the arguments of the previous chapters to one of their most important conclusions, namely that if the international system is becoming an individual, a developmental perspective, not an evolutionary one, becomes necessary in order to make sense of its contemporary and future transformations. Once we accept that the international system has achieved the degree of cooperation, integration and organization characteristic of an individual, and once we acknowledge its self-producing organization, we cannot simply continue to treat the system’s components, individual states, as if they constituted a mere population and be content to examine how natural selection forces operate on them individually. Indeed, the system has de-Darwinized and
natural selection pressures have been displaced to the system-level; the system itself is now the cooperative, integrated and organized whole on which natural selection forces operate. In order to understand the present and future transformations of this individual over the course of its lifecycle, then, an evolutionary perspective will unfortunately have very little to say. We will need a developmental perspective.

My goal in the next two chapter is to introduce and outline this developmental perspective and to illustrate its purchase for IR. Doing so will also enable me to finally begin to give some answers to the question that motivated this study in the first place: beginning to make sense of the puzzling mix of transformations and continuities in the international system in the globalization era. The application of development to the case of the latest transformation of sovereignty, the Responsibility to Protect, in chapter 6, will also represent the first presentation in an IR context of development as a distinct approach to the study of change.

**Beyond the evolutionary perspective on international system change**

In the introduction, I suggested that what needs to be explained when looking at the relationship between the international system and globalization is the combination of three phenomena: the presence of unprecedented transformations and challenges in the international system’s environment since 1945, the concurrent universalization and entrenchment of the sovereign state
systemic mode of political organization, and the fact that many of the environmental challenges to the international system are, to a large extent, products of the international system’s own activities.\textsuperscript{624} No perspective has thus far afforded a comprehensive grasp on this puzzling mix of continuities and transformations.\textsuperscript{625} As Spruyt puts it, “we not only lack answers to such questions, we do not even have appropriate means to think about these questions theoretically.”\textsuperscript{626}

In the introductory chapter I argued that the most widely used approach to the problem of international system change has been to investigate the system’s evolutionary origins for insights into its historical and future transformations.\textsuperscript{627} I will argue in chapter 5 that while a traditional evolutionary perspective raises the globalization puzzle, it cannot provide theory-consistent solutions. Indeed, because it assigns causal primacy to environmental selection and treats the environment as exogenous to the system, a traditional evolutionary perspective leads us to expect dramatic changes in the international system’s environment to prompt corresponding changes in the system itself. Assuming that states are structurally trapped in international competition dynamics, traditional Darwinian accounts expect states to “race to the bottom,” to be unable to face their environment as one, and thus to be forced into becoming \textit{products} of globalization pressures. An evolutionary perspective that privileges exogenous

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{624} For a richer description of these phenomena see ch. 1, pp.27-28
\item \textsuperscript{625} See Ripsman and Paul 2010: 177.
\item \textsuperscript{626} Spruyt 1994: 4.
\item \textsuperscript{627} Spruyt 1994; Spruyt 2002; Tilly 1992.
\end{itemize}
\end{footnotesize}
sources of change necessarily has great difficulty explaining international system’s persistence, expansion, and entrenchment despite globalization’s pressures without making ad hoc additions to its evolutionary core.

In chapter 6, I will argue that, lacking an understanding of evolution by cooperation, existing evolutionary accounts have missed the importance and consequences of the de-Darwinization of the international system. They have continued to treat the globalization environment as exogenous to the international system and as a result, they have not been able to make sense of the reciprocal relationship of mutual construction between the international system and its environment.

The developmental perspective on international system transformation that I will propose in chapter 6 complements the evolutionary and physiological perspectives of the previous chapters and provides foundations for a parsimonious explanation for the three trends that constitute the globalization puzzle. If the international system has undergone a transition to individuality, the story of its future transformations will be a developmental one. It will be characterized by successive developmental cycles in which changes in the structure of the international system will solve some problems but also generate new ones, thus prompting further developments and new sets of problems, until international sovereignty runs out of solutions and ‘dies.’
Outline of chapters 5 and 6

I have organized the next two chapters as follows. In chapter 5, I begin with a discussion of evolutionary thinking, focusing on the history of its relationship to development, and outline popular evolutionary models that have been applied in IR and the rest of the social sciences more generally. In the second section, I discuss the explanatory structure of evolutionary IR applications, and offer a critique that focuses on three state-of-the-art accounts by Gilpin, Spruyt and Florini.

In chapter 6, after introducing developmental thinking as an alternative perspective on change and presenting two contending images of development, I offer historical and sociological reasons why development has been marginalized in the social sciences generally and ignored in IR in particular. In the next section, I outline a developmental perspective inspired by Developmental Systems Theory (DST) and tie it to the physiological perspective on the international system of Part B. I then follow with an example from the philosophy of science and contrast Karl Popper’s evolutionary perspective on scientific progress with Imre Lakatos’ developmental perspective. I conclude this chapter with a discussion of the development of the international system and an examination of the most recent transformation in the institution of international sovereignty, the R2P.
In this chapter, I offer a short review of evolutionary thought and critique existing evolutionary accounts of the transformation of the international system. This chapter sets the stage for my argument in favor of a developmental perspective in the next chapter.

**A short introduction to evolutionary thinking in biology**

Evolution is one of the most successful, widely-known and prestigious scientific theories in the history of science. Ernst Mayr calls it “the greatest intellectual revolution experienced by mankind,” a revolution that “single-handedly effected the secularization of science.” More colorfully, Richard Dawkins suggests that

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if more advanced alien civilizations visited earth, they would probably ask, in order to evaluate human civilization, “Have they discovered evolution yet?”

While Darwin is widely credited as the father of evolution, the issue of evolution had been hotly debated in the decades preceding the publication of *The Origins of Species* in 1859. Even today, at a time when the modern synthesis and the advances of molecular biology seem to have decisively tilted the debate in favor of Darwin’s theory of evolution by natural selection, almost everything about evolution remains under challenge in some corner of biological theory. Indeed, variants of the theory are numerous and often represent ‘adaptations’ in the face of challenges to the theory at different points of its history. My focus in this discussion will be on one challenge in particular, the whole-organism, structuralist challenge, mostly coming from developmental biologists, to the reductionism of the Neo-Darwinian, modern evolutionary synthesis.

After an overview of conventional, ‘textbook’ views on evolution, I quickly move into various challenges from within and without evolutionary biology that bear on the issue of international system change. Following a short discussion of Darwinism, I introduce the evolutionary views of Jean-Baptiste Lamarck, a predecessor of Darwin whose ideas, while they have long been discredited in biology, have remained somewhat popular across the social sciences because of their apparent applicability to the problem of human agency and culture. I then

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630 Larson 2006.
631 See Ruse 2008.

Throughout this review, my objective is to pave the ground for my argument in favor of the importance of whole-organism concepts, and development in particular, for IR. As such, I propose a reading in two acts of the history of evolutionary thought, from Darwin to contemporary debates. The first act describes a reductionist movement, away from the concept of organism and towards environmental determinism, which culminates in Dawkins’ gene-eye view of evolution. The second act describes the return of the pendulum, back to a whole-organism approach, from Gould’s punctuated equilibrium model, which attempted to incorporate assumptions about developmental constraints, to the recent evolutionary developmental biology (Evo-Devo) and developmental systems theory (DST).632

*Evolution: variation, selection and inheritance in populations*

What is evolution? At the most general level, evolution means any kind of ‘historical’ change that is ‘directional’ and ‘continuous.’633 Unlike Isaac Newton’s

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632 Before going further, it is important to note that the account I propose here reflects the development of Anglo-American evolutionary thought, but not the history of Continental European evolutionary thought, which has never really departed from whole-organism concepts. Of course, other takes on the history of evolutionary ideas are possible, although the reading that I propose here is shared by a number of prominent evolutionary thinkers, notably Gould and Richard Lewontin, and has the additional merit of offering IR students additional historical reasons why evolution, and not development, has come to influence IR thinking about system change, despite the importance of the latter in biological thought and its potential for IR. Gould and Lewontin 1979.

theory of motion, for instance, which is about the effects of synchronic changes in parts of a system on other parts of the same system, evolution is inherently diachronic, or historical. However, while saying that evolution is directional and continuous change may be enough to contrast it with two alternative models of historical change, cyclical and radically contingent models of change, it does not suffice to differentiate it from development, the other diachronic perspective on biological change that interests me here.

A look at the etymology of the term evolution is instructive in this respect. Before Darwin, the term evolution was actually used to denote any form of historical change, including development. We can trace the first use of the term evolution to Charles Bonnet, an 18th century Swiss philosopher, who used it to denote his ‘preformationist’ theory of individual development. In Germany, the term ‘Entwicklung’ was used to describe both ontogeny and phylogeny.⁶³⁴ Indeed, as Philip Sloan notes, “prior to the second half of the nineteenth century, the term was used primarily, if not exclusively, in an embryological sense to designate the development of the individual embryo.”⁶³⁵ The common usage of the term reflects this history, as in the definition of “evolution” by the Oxford dictionary as “the gradual development of something,”⁶³⁶ which can only add to the confusion about the two conceptions of change outside the disciplinary discourse of modern biology.

⁶³⁴ Ibid: 80.
⁶³⁵ Sloan 2014.
⁶³⁶ Oxford dictionary online.
Since Darwin, however, evolution and development have gradually come to be understood as very distinct models of biological change. Today, all modern evolutionary theories are about historical change in the traits exhibited by populations of individuals, as their individual members reproduce and die at different rates over successive generations, and all modern developmental theories are about how individuals change over the course of their lifecycles. As David Depew and Bruce Weber succinctly put it, “Organisms develop. Only populations of organisms evolve.”637 From here on, then, whenever I refer to ‘evolution’ I will follow contemporary practice in biology and denote change in populations of individuals. For the change an individual undergoes over the course of its lifecycle, I reserve the term ‘development.’

What is the structure of evolutionary theory? A useful starting point is Lewontin’s evolutionary ‘tripod’:

“As seen by present-day evolutionists, Darwin's scheme embodies three principles: (1) Different individuals in a population have different morphologies, physiologies, and behaviors (phenotypic variation); (2) Different phenotypes have different rates of survival and reproduction in different environments (differential fitness); (3) There is a correlation between parents and offspring in the contribution of each to future generations (fitness is heritable). These three principles embody the principle of evolution by natural selection. While they hold, a population will undergo evolutionary change.”638

These three factors are jointly necessary and sufficient for Darwinian evolution.

“If there is no variation among organisms,” Lewontin insists,
“then even if different individuals leave different numbers of offspring, nothing will change. If there were no heredity of characteristics, then even if different organisms left different numbers of offspring, there would be no effect on the characteristics of the next generation. Finally, if different organisms all left exactly the same number of offspring no change would be expected in the composition of the population.”

Indeed, particular evolutionary theories only diverge on the relative importance of each in producing evolution. The evolutionary tripod of variation, selection and inheritance is a useful heuristic that enables the comparisons among distinct approaches emphasizing one or a combination of these three factors over others. For instance, as we will see shortly, Darwin emphasized the importance of (2) and (3), and Lamarck (1) and (3).

*Darwin, variational (populational) thinking, and evolution by natural selection*

The revolution in biological thinking ushered by Darwin and his less-known contemporary Alfred Russell Wallace came from their reframing of the concept of ‘population,’ which enabled a new way to think about variation. Ernst Mayr was the first evolutionary thinker to discern the importance of this intellectual shift in biological theory. Mayr suggests that Darwin’s predecessors and contemporaries, Lamarck being the most prominent example, were ‘typological’ thinkers, in the Platonic tradition. Typological thinkers understand evolution, not in terms of changing population of concrete and unique ‘individuals,’ as we have become accustomed to since Darwin, but in terms of changes in *classes* of organisms of a

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639 Fracchia and Lewontin 2006.
given type. Mayr summarized the distinction in a widely-cited passage worth quoting at length:

“The assumptions of population thinking are diametrically opposed to those of the typologist. The populationist stresses the uniqueness of everything in the organic world. What is true for the human species – that no two individuals are alike – is equally true for all other species of animals and plants. Indeed, even the same individual changes continuously throughout its lifetime and when placed into different environments. All organisms and organic phenomena are composed of unique features and can be described collectively only in statistical terms. Individuals, or any kind of organic entities, form populations of which we can determine the arithmetic mean and the statistics of variation. Averages are merely statistical abstractions, only the individuals of which the populations are composed have reality. The ultimate conclusion of the population thinker and of the typologist are precisely the opposite. For the typologist, the type (eidos) is real and the variation is an illusion, while for the populationist the type (average) is an abstraction and only the variation is real. No two ways of looking at nature could be more different.”

Darwin’s grasp on the importance of individuality came from his association with animal and plant breeders. The art of breeding is to recognize the unique characteristic of each individual in a population, so that individuals with desired characteristics may be singled out and intensively bred until the desired characteristic is effectively reproduced.

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640 Here I refer to our commonsensical understanding of the term ‘individual’ as a spatiotemporally unique entity. I have said (a lot) more on the contested question of individuality in chapter 2.

641 Mayr 1959.
As Mayr puts it, thus, “(Darwinian) evolution is best understood as the genetic turnover of the individuals of every population from generation to generation.”642 Darwinian evolution further specifies that natural selection is the primary mechanism through which evolution occurs. This is another aspect of Darwinism that distinguished it from his predecessors and contemporaries, such as Lamarck, who believed that much of the creative force behind evolution resided in the processes producing variation.643

Mayr offers a succinct summary of Darwin’s theory of natural selection as three inferences drawn from five biological facts (summarized in table 5.1 below). In developing his theory of natural selection, Darwin was influenced, this time, by Thomas Malthus’ idea about the size and quality of life of populations, which he believed to be determined by the interaction of exponential population growth with the earth’s finite supply of resource.644 The interaction of these two factors produces resource scarcity which, he expected, would generate intense competition over these resources.645 Because the individuals that compose a population vary in their characteristics, and some will necessarily be more successful than others, the terms of competition will be determined by the natural environment (the available resources, the presence of predators, the climate, etc.) Individuals with traits that are compatible with the exigencies of their environment will have a greater likelihood of survival. Since survivors can

642 Mayr 2001: 76.
645 For the best application of this idea to international politics, see Dixon 1999.
be presumed to have, in general, more offspring, and since offspring tend to share important traits with their parents, then, we should expect the traits of ‘successful’ individuals to become increasingly represented within the population over successive generations. Hence, Darwin concluded that, because the character of the natural environment determines which traits will ultimately be successful, natural selection would be the driving force behind evolution.

Table 5.1 – The logic of Darwinian evolution

| Fact 1: | Exponential population growth because of unlimited fertility (Malthus) |
| Fact 2: | Yet, population size remains stable over time (Malthus) |
| Fact 3: | Why? Limited resources; a given environment can only keep a population alive up to a certain size (Malthus) |
| Inference 1: | Competition for scarce resources (from Malthus) |
| Fact 4: | No two individuals are exactly the same in a population (from the practice of breeding) |
| Inference 2: | Individuals from a given population will differ in their probability of survival (Darwin’s) |
| Fact 5: | Many differences among individuals are heritable (from the practice of breeding) |
| Inference 3: | Natural selection over successive generations leads to evolution (Darwin’s) |

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Variation is thus necessary to the operation of natural selection. If individuals do not differ in their characteristics, successive generations will look alike and there will be no basis from which anything can be selected to produce evolution. Depew and Weber summarize the respective roles of variation and selection in Darwinian evolution: “genetic variation ... is the fuel of natural selection and natural selection, not mutation as such, is the actual cause over multiple generations of states of relative adaptedness in populations and of adaptive traits in organisms that are members of those populations.” Variation must thus not only be ‘plentiful’ and ‘ubiquitous,’ but it must also be ‘random,’ “in the sense that you can only say statistically how many changes there will be, and they do not occur according to the needs of the possessor.” Indeed, if we assume variation is ‘directed’ towards adaptive fitness, then the autonomous role of natural selection in evolution becomes unclear.

A problem with the term ‘selection’ is that it connotes the presence of an agent doing the selecting. But who selects in natural selection? As I already mentioned, Darwin’s theory was inspired by animal and plant breeding, a process in which there is a clear agent, the breeder, who selects individual animals or plants with an eye to the reproduction of desirable characteristics. In Darwin’s account, however, selection operates without an agent, ‘behind the backs of organisms,’ so to speak.

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“The progenitors of the next generation are those individuals among their parents’ offspring who survived owing to luck or the possession of characteristics that made them particularly well adapted for the prevailing environmental conditions. All their siblings were eliminated by the process of natural selection.”

In popular culture, natural selection is generally understood through two related metaphors, the ‘struggle for existence’ and the ‘survival of the fittest.’ The first expression is the title of the third chapter of Darwin’s *Origins*: “as more individuals are produced than can possibly survive, there must in every case be a struggle for existence.” The second comes from the British sociologist and early Social Darwinist Herbert Spencer but was later adopted by Darwin, though he came to regret this endorsement. Both ideas seem to suggest that “to be fit means to possess certain properties that increase the probability of survival.” This has led to much confusion about the meaning of the notion of ‘fitness’. Indeed, unlike what the racist doctrines using the rhetoric of fitness claim, Darwin’s concept of fitness does not suggest that an organism is superior to another in any objective sense; fitness is always environment-dependent and subject to modification as that environment changes. Adaptations that make an individual ‘fit’ in a given environmental can make it ‘unfit’ in another environment.

Before moving forward, it is important to return to a point that I have repeatedly hammered in the introductory chapter: Darwinism treats the organism’s environment as a force that is exogenous to the organism. While both variation and selection are necessary in Darwin’s account of evolution, the emphasis on

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650 Darwin 1859.
651 Mayr 2001: 118.
natural selection requires a sharp separation between individual, organism-level variation, and the environment driving selection. As Lewontin puts it:

“In Darwin’s theory variation among organisms results from an internal process, what is now known as gene mutation and recombination, that is not responsive to the demands of the environment. The variants that are produced are then tested for acceptability in an environment which has come into being independent of variation. The concept of variation is causally independent of the conditions of selection.”\(^\text{652}\)

Natural selection has the last word on evolution and is thus said to be the creative force behind evolution. The metaphors expressing this idea abound:

“The organism proposes and the environment disposes. The organism makes conjectures and the environment refutes them. In the most popular current form in the technical literature of evolutionary studies, the environment poses problems and the organism throws up random solutions.”\(^\text{653}\)

As I will discuss later on, the modern synthesis offered a genetic justification for exogenizing the environment and making natural selection the primary cause of evolution.

\textit{Lamarck, directed variation and evolution through the inheritance of acquired traits}

If Darwin’s theory is a ‘variational’ theory of evolution, Lamarck, a predecessor of Darwin that was very influential in Darwin’s time, proposed a ‘transformational’ one. For ‘transformationists’ like Lamarck, each species evolved from a single

\(^{652}\) Lewontin 2000: 42.
\(^{653}\) Ibid: 43.
ancestor cell that had been ‘spontaneously’ generated. Indeed, Darwin was the first to speak of ‘branching’ evolution, based on the evidence he had collected on the evolution of three distinct species of mockingbird on three different islands of the Galapagos archipelago.

Lamarck believed that evolution progressed through the inheritance, over successive generations, of characteristics acquired during the organisms’ development. He proposed that organisms modified their behavior and formed new habits in response to environmental challenges in the course of their development. These new habits, or ‘acquired traits’ would be transmitted from one generation to the next; traits that were used would be retained and traits that were disused would disappear over time. One frequently cited examples of this process is the long neck of the giraffe, which Lamarck believed had grown over successive generations reaching for ever higher branches in the competition for fresh leaves. Another example are cave creatures, like bats, which were hypothesized to have eventually lost eye vision through ‘disuse’ of that unnecessary function. Adaptation via development, not via natural selection, is thus the primary Lamarckian mechanism.

We can think about Lamarck as advancing a ‘developmental’ model of evolution. Development is an older science than the population thinking that came with Darwinian evolution (it can be traced as far back as Plato, 2,250 years before

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656 Ibid: 81.
Darwin). It is also more immediate to experience: we see and experience the development of organisms all around us, but in order to ‘see’ evolution, we have to take a historical perspective and we need a statistical construct, the population, that transcends our immediate experience.657

Contrary to Darwin, Lamarck thus emphasized the role of ‘directed’ variation (toward adaptation to environmental conditions) in producing evolution. This view was made possible by Lamarck’s views on inheritance, in which acquired characteristics could be passed on from generation to generation, what Mayr later called ‘soft’ inheritance as opposed to the ‘hard’ inheritance of innate traits. As I will discuss shortly, this view has later been discredited by the genetic revolution and the modern synthesis, but up until that point, Lamarck remained a serious alternative to Darwinism. Indeed, while Darwin suspected that keys to variation lay in the study of embryos, he admittedly remained, to his death in 1882, befuddled by the sources of variation. All that Darwin knew and needed to know in order to successfully make his argument in favor of the central role of natural selection in evolution was that variation was and needed to be abundant enough for natural selection to operate.658 It is not until the Modern Synthesis with Mendelian genetics that Darwinism became a complete (though still contested) explanation and that Lamarck was (temporarily) defeated.

It is important to note, before moving forward, that despite these important differences, both Darwinism and Lamarckism predict the same population-level

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657 It is thus even more surprising that we have ignored it in the social sciences.
658 Mayr 2001: 89.
effects: environmental changes are expected to lead, over time, to adaptive changes in the composition of the population of interest. Thus, the emphasis on learning in Lamarckian models should not obscure the fact that both Darwinian and Lamarckian models posit the environment as the primary source of change. Strong environmental changes are expected to produce corresponding changes in the populations that inhabit this environment. The difference between the two accounts is where environmental pressures are processed: at the individual-organism level (via learning) in Lamarckian models and at the population level (through natural selection) in Darwinian models. This similarity between Darwin and Lamarck will be important for my critique of evolutionary IR.

The modern synthesis: genetic reductionism, environmental determinism, and the passive organism

Lamarckism was not fully discarded until the development of molecular genetics and its alliance with Darwinian evolution. Darwin himself accepted the possibility that the ‘soft’ inheritance of acquired characteristics could play a role at the level of variation, although he disagreed vehemently with Lamarck’s conclusion that variation was the primary mechanism of evolution and continued to insist on the greater role of natural selection.659

The Modern Synthesis (or Neo-Darwinism) is the product of a number of key findings in molecular genetics that vindicated Darwin’s emphasis on natural selection. Under the influence of the molecular revolution, variation, selection

and inheritance were recast in genetic terms, and the whole-organism came to be seen as a passive artifact of evolution, rather than its main protagonist.

The key discovery that made this shift possible was August Weismann’s discovery, in the 1880s, of a ‘genetic barrier’ in development. Multicellular organisms, he proposed, are composed of ‘germ’ cells and ‘somatic’ cells. While germ cells contain and transmit heritable information, somatic cells work together to constitute the bodily functions of the organism. Weismann argued that only the information contained in germ cells could be transmitted via inheritance. His crucial discovery was the sequestration of germ cells from somatic cells very early in development. As a result of this early separation, while germ cells transmit information to somatic cells (they contain the blueprint to build them), the information acquired by the somatic cells during development cannot be transmitted back to germ cells and therefore, inherited. Information is transmitted only one way, from germ to soma.660 This was later reformulated as the ‘Central Dogma of Molecular Biology’ by Francis Crick, who stated that “DNA makes RNA and RNA makes protein” and that the reverse (protein making RNA and DNA) does not occur.661

In light of Weismann’s barrier and the Central Dogma, “only the heritable part of variation plays a role in evolution.”662 Mayr calls this ‘hard’ inheritance, as opposed to the ‘soft’ inheritance of acquired traits proposed by Lamarck. Another

660 Weismann 1893.
661 Crick 1970.
662 Mayr 2001: 89.
way to put this is that modifications of an individual’s physical characteristics (the phenotype) in the course of development have no incidence on that individual’s (inheritable) genotype, and thus, cannot influence evolution. Once accepted, these discoveries effectively discredited Lamarck’s theory of evolution via inheritance of acquired characteristics.

Neo-Darwinism thus represented a major reductionist movement, away from the organism and towards the gene. Because what happens over the lifecycle of the organism was not seen as mattering in evolution, Neo-Darwinians felt justified in making the whole-organism – together with its functional organization and complex systemic properties – irrelevant from the vantage point of evolution. Since all that mattered from evolutionary standpoint were the germ cells, that is, the genotype and the information it carries, organisms could be conceptualized as mere genetic ‘artifacts,’ that is, “as assemblies of independently adapted parts and traits.”

In the modern synthesis, thus, the gene is the agent of evolution and individual organisms, being mere artifacts of their genes, are cast in a ‘passive’ role vis-à-vis the evolutionary pressures they face. In other words, “organisms as developmental processes do not enter at all into the conceptual framework of population genetics as a theoretical entity.”

Another key discovery marking the shift to the gene was the discovery of the role of genetic mutations and other contingent genetic processes as variation-generating mechanisms. “Gene mutations are due to errors of replication during

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664 Ibid: 97.
cell division. Any mutation that induces changes in the phenotype will either be favored or discriminated against by natural selection.” Similarly, with the modern synthesis, a genetic explanation – the ‘gene flow’ – was found for the generally slow and gradual rate of evolutionary change. The gene flow is the migration of genes from one population to another. “Gene flow is a conservative factor that prevents the divergence of only partially isolated populations and it is a major reason for the stability of widespread species and for the stasis of populous species.” Evolutionary change will thus be more pronounced in cases where smaller populations are geographically isolated or where the environmental pressures are global, thus preventing the gene flow from dampening evolutionary change.

The modern synthesis also sharpened Darwin’s separation between the organism and its environment. As we have seen, in Darwinian adaptationism, traits are explained by their adaptive function vis-à-vis an environmental problem; ‘problems’ are presented by the environment and ‘random solutions’ are proposed by the organism (via genetic mutations). Organisms are the product of environmental pressures: the environment carves out ‘niches’ that organisms, over successive generations, gradually occupy. The origin of a given trait is thus explained by finding out what environmental problem it represents a solution for.

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666 Ibid: 98.
667 Lewontin 2000.
Darwin’s conception of fitness differed from its predecessors’ in fundamental ways. Against the idea of the ‘Great Chain of Being,’ in which everything that is was believed to have been put in its right place by a divine Creator, Darwin secularized the meaning of fitness by appealing to the creative role of natural selection. Darwin’s take on fitness also differed from Lamarck’s in a fundamental way. As Lewontin puts it:

“Lamarck’s theory of evolution assumed the inheritance of acquired characteristics. That is, circumstances outside the organism could be incorporated into the organism in a permanent and heritable fashion through the organism’s will. Darwin created a dramatic rupture in this intellectual tradition by alienating the inside from the outside: by making an absolute separation between the internal processes that generate the organism and the external processes, the environment, in which the organism must operate.”

Neo-Darwinism provided a genetic foundation for Darwin’s marginalization of the role of the organism in its evolution. In the modern synthesis, organisms are ‘passive’ in their evolution and development: genes are the product of evolution, the genotype is fixed early on in development, mutations are random, development is driven by genes, etc.

The image of fitness landscapes captures the relationship between organism and environment in Neo-Darwinism. Imagine a landscape with peaks and valleys. Height represents fitness. With each instance of reproduction, there is a non-zero chance that a mutation may occur that will improve its bearer’s ability to survive and reproduce in its environment. Organisms ‘located’ near or on fitness peaks

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668 Ibid: 42.
will reproduce more frequently. Over time, the population of organisms will come to occupy those peaks.

Two mechanisms are responsible for this evolution: random mutations and natural selection. As Depew and Weber put it, “in this view the organism is the object of evolutionary forces, the passive nexus of independent external and internal forces, one generating ‘problems’ at random with respect to the organism, the other generating ‘solutions’ at random with respect to the environment.”669 “In a curious sense,” Lewontin notes, “the study of the organisms is really a study of the shape of the environmental space, the organisms themselves being nothing but the passive medium through which we see the shape of the external world.”670

If each organism is well-adapted to its environment, however, how does one account for further evolution? Indeed, if the whole population occupies the same fitness peak, the rate of reproduction will be the same for each individual. Addressing this problem, Leigh Van Valen proposed a picture of evolution in which the environment is always changing and organisms try to keep up (not purposively, though, but still by throwing up random solutions via genetic mutations they cannot control).671 The image is of a shifting landscape (a ‘seascape’).672 If we accept this view, as Lewontin puts it, “it is the autonomous forces of environmental change that govern the rate of evolution, and we would

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669 Ibid: 47.
670 Ibid: 44.
672 Mustonen and Lässig 2009.
be well advised to study the laws of environmental rather than organismic change if we want to understand what has been happening."\textsuperscript{673}

\textit{Dawkins’ gene-eye model of evolution}

The molecular revolution initiated a ‘reductionist’ trend in evolution, which was undoubtedly assisted by the fact that gene frequencies were more amenable to mathematical treatment than more complex systems like individual organisms.\textsuperscript{674} The reductionist view of evolution culminated with Dawkins’ gene-eye view of evolution, in which the organism is a mere ‘robot vehicle’ for the real agents, selfish genes, a view that offers a stark contrast with Lamarck’s more agentic organism, constantly thriving to adapt to the pressures of its environment. In an important way, Dawkins summarized popular views of the time in a manner that was accessible to a wider audience beyond evolutionary biology. As such, as Maynard Smith put it in a review of Dawkins’ work, “a good way to understand what Dawkins is up to is to grasp the nature of the debates which were going on between evolutionary biologists during the 1960s and 1970s.”\textsuperscript{675} One of the most intensely debated topics during that period was the issue of widespread cooperation and altruistic behavior in many ‘social’ organisms, which clashed with the Darwinian emphasis on the competition for survival.\textsuperscript{676}

\textsuperscript{673} Lewontin 2001: 63.
\textsuperscript{674} Depew and Weber 2011.
\textsuperscript{675} Maynard Smith 1982.
\textsuperscript{676} Depew and Weber 2011.
One intuitive take on the phenomenon of altruism was the ‘group selection’ idea, which is most associated with V. C. Wynne-Edwards, who argued that some adaptations had survived through group selection rather than individual selection. The idea came from the observation that making short-term sacrifices for the benefit of a larger, more cohesive group, could improve the survival prospects of the group. Examples of such ‘altruism’ abound, such as ant colonies, where an important proportion of individuals forgo reproduction, and human societies, where individuals in their prime reproductive years sacrifice their lives in war for the security of their country.

The group selection hypothesis, however, was widely discredited in the 1960s. The problem was that group selection came to be seen as untenable from a strictly Darwinian standpoint. Indeed, as prominent critics like George Williams argued, if Darwinism is correct, it would only take one ‘selfish’ individual to unravel group cooperation over successive generations. This is because evolution is the product of differential reproduction. Since it can be assumed that selfish individuals will reproduce more often on average than altruistic ones, the composition of the group will, over time, tilt towards selfish types. Eventually, selfish types will significantly outnumber altruistic types and group cohesion will break down.

While this logic is difficult to contradict without rejecting Darwinism entirely, there remained a tension: groups and instances of altruism abound in the

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678 Williams 1966.
biological world. Two answers appeared to resolve the issue for Neo-Darwinians: kin selection and the gene-eye perspective on evolution. Hamilton’s ‘kin selection’ hypothesis provided a plausible explanation consistent with Darwinism. “If a gene were to cause its possessor to sacrifice its life in order to save the lives of several relatives,” he argued, “there might be more copies of the gene present afterwards than if the sacrifice had not been made.”

Something that is not necessarily good for the individual can nonetheless help a kin, thus helping that kin spread its (similar) genes. “By helping a close relative reproduce, an individual is still passing copies of its genes on to the next generation, albeit indirectly.”

As Wilson puts it:

> “Individuals evolve to maximize the fitness of ‘their genes’ relative to other genes in the population, regardless of whether ‘their genes’ are located in children, siblings, cousins, parents, and so on. Aid-giving toward relatives therefore ceases to appear altruistic, and becomes part of an individual’s ‘selfish’ strategy to maximize its inclusive fitness. Even sterility and death can be inclusive fitness maximizing if the positive effects on relatives are sufficiently great.”

Kin selection makes perfect sense if we adopt the individual gene as the fundamental unit of natural selection. The ‘gene-eye’ perspective on evolution was developed by Williams in the most cited reference of this period, *Adaptation and Natural Selection* and was later popularized by Dawkins. If Darwinian selection takes place at the level of the gene, it is perfectly ‘rational’ for genes

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679 Ibid.
residing in one organism to favor the reproductive success of another organism with similar genes. ‘Selfish’ genes compete, ‘altruist’ organisms cooperate.

The gene-eye view of evolution is built on the distinction between replicators and vehicles. Good replicators possess three characteristics: longevity, fecundity and copying-fidelity. The replicator, from this perspective, is the gene. Sexually reproducing organisms, however, create imperfect copies of themselves and as a consequence, have a short evolutionary life. Barring very rare mutations (copying errors), however, genes replicate very faithfully, and as such, can persist in the same form across multiple generations. Genes are thus the ultimate replicators. So what are organisms? Organisms are merely vehicles, constructed by genes, for genes. As Dawkins himself puts it, “we are survival machines – robot vehicles blindly programmed to preserve the selfish molecules known as genes.”

The extreme reductionism of Dawkins’ gene-eye view of evolution prompted a swing of the pendulum in biology, back to a whole-organism perspective on evolution and development. In the next sections, I turn to the structuralist critiques of Neo-Darwinism, and more specifically, to Gould’s punctuated equilibrium model of evolution and to the emergence of developmental systems theory.

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682 Dawkins 2006: xxi.
The return of the organism: Gould and the punctuated equilibrium model of evolution

While the population geneticists of the Modern Synthesis were adopting a view of the organism as a passive ‘artifact,’ a number of scholars in different corners of biology, most prominently Lewontin, Mayr and Gould, remained sensitive to the role of developmental processes. In this section, I emphasize Gould, because he is one of the most prominent evolutionary thinkers of the second half of the 20th century and his work has had a significant influence in the social sciences, including in IR, where the punctuated equilibrium model he developed with fellow paleontologist Niles Eldredge has been used by Spruyt in arguably the best explicitly evolutionary work on systems change in IR to date.683

Indeed, while the modern synthesis is rightly held to be one of the greatest achievements of 20th century biology, within biology there remained a significant core of discontent that deplored how it had marginalized developmental processes. This ‘structuralist critique’ objected neo-Darwinism’s reductionist view of organisms as mere collections of traits. Instead, it proposed taking a more holistic one, pointing to evidence suggesting that development processes at the level of the whole organism impose important constraints on evolutionary processes.

The problem for Neo-Darwinism, the structuralists pointed out, was that its view of evolution as slow and gradual was not supported by the fossil record. If

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gradualists are correct, the fossil record should exhibit a continuous and gradual evolutionary chain. Instead, the fossil record contains large gaps; the specimens exhibiting the incremental changes leading to the formation of radically new species, which constitute crucial evidence for the gradual view of evolution, are nowhere to be found. As is to be expected of a research paradigm of evolutionary biology’s stature, however, this gap in the fossil record was not initially perceived as a serious anomaly because evolutionary biologists lacked a theoretical alternative to gradual evolution.\textsuperscript{684} For a long time, thus, these infamous missing, intermediary links in the evolutionary chain were explained away as a mere ‘missing data’ problem caused by the poverty of the fossil record.

In an influential article, Eldredge and Gould, two paleontologists, proposed a new way to think about the problem of missing links. The reason intermediary links were missing, they argued, was simple: they never existed in the first place.\textsuperscript{685} To replace the gradualist view, they proposed an alternative model of evolution, ‘punctuated equilibrium’: long periods of morphological stability (equilibrium) interrupted by relatively short periods of rapid change (punctuations).

This pattern, they argued, raised the ‘problem of form,’ or ‘morphological stasis,’ “the question of how a morphology (form) can be sustained as a relatively distinct grouping in morphospace over time and yet exhibit the capacity for periodic transformations.”\textsuperscript{686} A key factor in explaining morphological stasis was the

\textsuperscript{684} Kuhn 1962, 1996.  
\textsuperscript{685} Eldredge and Gould 1972.  
\textsuperscript{686} Smith 1993: 435; Eldredge and Gould 1972.
notion of developmental constraint. In a widely cited article, Gould and Lewontin made an analogy between developmental constraints in complex organisms and architectural constraints. Architectural constraints are elements of architectural design that are made necessary by the prior choice of a given feature. Each choice in architectural design restricts the range of subsequent choices available to the architect.

To illustrate how the notion of constraint challenges Neo-Darwinism, they gave the example of the ‘spandrels,’ “the tapering triangular spaces formed by the intersection of two rounded arches at right angles” which are “necessary architectural by-products of mounting a dome on rounded arches.” Spandrels are found in many European cathedrals characterized by large central domes, in which they are usually richly decorated with biblical representations. When looking at them, Gould and Lewontin suggest, one is tempted to infer that the purpose of the spandrels is to create a space for these beautiful representations. This is, however, a misleading picture. Spandrels are actually there because of the large dome they help support. “The system begins with an architectural constraint: the necessary four spandrels and their tapering triangular form. They provide a space in which the mosaicists worked; they set the quadripartite symmetry of the dome above.”

Challenging Neo-Darwinian adaptationism, Gould and Lewontin thus suggest that many traits of organisms are there, not as adaptive ‘solutions’ to

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environmental ‘problems,’ but as a byproduct of prior developments. They give the example of the Tyrannosaurus’ minuscule arms, which they argue are “likely to be a developmental correlate of allometric fields for relative increase in head and hindlimb size.” Rather than breaking down the organism in discrete traits, each of which is unproblematically seen as an individual adaptation, they propose instead to take an approach in which the organism is conceptualized as an integrated, structural whole.

Equilibrium, they postulated, is thus the ‘normal’ state within populations and individual organisms, as homeostatic tendencies (developmental constraints figuring prominently) in both jointly create powerful conservative tendencies. Powerful exogenous ‘shocks,’ however, can disrupt this equilibrium, triggering rapid variation and selection cycles which are responsible for the creation of new species. To account for these rapid variation-selection episodes, they borrowed from Mayr’s idea that “new species form when a small population becomes geographically isolated from the main group.” His idea was that “the new or particularized environment, coupled with a greatly restricted gene pool, accelerates the evolutionary process and facilitates the formation of new species.” Another possibility is that the environmental shock is of such a global scope that a situation similar to the case of the isolated population can be replicated on a larger scale involving multiple populations.

\[689\] Ibid: 85.
While punctuated equilibrium brought back a concern with the homeostatic tendencies of whole organisms, it was primarily an attempt to account for the macro-level pattern observed in the fossil record. It was not an attempt to identify the exact ‘micro-level’ mechanisms at work in the organism. Eldredge and Gould suggested that the explanation for the punctuated equilibrium pattern they observed in the fossil record “probably lies in a view of species and individuals as homeostatic systems – as amazingly well-buffered to resist change and maintain stability in the face of disturbing influences.” Yet, they did not specify these hypothesized mechanisms further, and their relationship to environmental shocks was not endogenized.\footnote{Eldredge and Gould 1972: 114.} While it took a more holistic view of the organism, as with other Darwinian views, the environment was still treated as exogenous to the evolving system. Because it does not specify the range of adaptations a system can produce without undermining its organization,\footnote{I discuss this concept in greater detail later in this chapter, in the section on development.} punctuated equilibrium can only offer vague answers to questions about the conditions under which a given equilibrium will be punctured.

In sum, after ignoring developmental processes for decades under the modern synthesis, evolutionary biologists have more recently begun exploring solutions to the problem of morphological stasis by investigating how developmental processes constrain evolutionary change. The history of evolutionary thought can thus be read in two acts. First, from Darwin to the modern synthesis, and culminating with Dawkins’ gene-eye worldview, there was a shift away from the
whole-organism. In this reductionist perspective, the environment was treated as exogenous to the evolving system and is given the primary creative role in evolution. Then, there was a return of the pendulum, which brought back the whole-organism and its development into evolution in order to account for the anomalies generated by the reductionist movement.\textsuperscript{693} Punctuated equilibrium was a way to reconcile these anomalies within an evolutionary framework. While it captured the pattern of morphological stability, it continued to treat the environment as an exogenous force in evolution. Still, these pointed to the importance of developmental processes, and motivated a renewed interest in the organism and its interaction with its environment in evolution and development.

\textit{Towards evolutionary developmental biology (EvoDevo)}

As Weber and Depew put it, “we are (now) living in a time when the central problem in theoretical biology is the integration of developmental biology with genetics and evolutionary theory.”\textsuperscript{694} This agenda has guided the work of many evolutionary biologists for the last 20 years, and there has been a significant increase in research seeking to identify the developmental mechanisms that constrain evolution in order to integrate evolutionary and developmental processes into a unified theory of biological change.

In evolutionary biology, these efforts have led to the foundation of a now vibrant subdiscipline, evolutionary developmental biology, or EvoDevo. EvoDevo is an attempt to solve a number of problems with the modern synthesis (notably the

\textsuperscript{693} For a summary of these problems, see Depew and Weber 2011. 
\textsuperscript{694} Ibid: 239.
problem of stasis) by exploring the interaction between population-level evolutionary processes and individual-level developmental processes, thus returning to Darwin’s original, but undeveloped insight. The EvoDevo turn thus pushes punctuated equilibrium further by postulating and investigating the idea that “a causal-mechanistic interaction must exist between the processes of individual development and the processes of evolutionary change.” After more than two decades of research, EvoDevo is now well established within biology and widely recognized as a full-fledged disciplinary branch within biology, with its own dedicated journals, its panel at the National Science Foundation, and its professional societies. Before we are ready for an EvoDevo perspective, however, we need to talk in greater depth about development, but first I want to discuss and offer a critique of evolutionary IR applications.

The explanatory structure of evolutionary IR

There is a long history of interactions between biology and the social sciences. Darwin and Spencer were contemporaries and had extensive intellectual exchanges. Biologists interested in social insects referred to these as societies and sociologists referred to human societies as organisms. With the success of the modern synthesis and the popularization of evolutionary theory by a number of talented writers such as Gould and Dawkins, evolutionary theory spread to the

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696 Laubichler and Maienschein: 3.
social sciences. While recent interactions have mainly been a one way street from biology to the social sciences, an exception is the work of game theorists who have made important contributions to debates in biology. The work of IR scholar Robert Axelrod on the evolution of cooperation, for instance, remains widely cited by biologists.

In IR, we have borrowed evolution in two different ways. On the one hand, sociobiological theories of IR make evolutionary biological arguments about human nature as it pertains to IR phenomena, such as war and aggression. On the other, there are metaphorical uses of evolution, in which an analogy is made between a biological population and the international system, or between genes and norms. While much interesting sociobiological work has been done in IR, notably by Bradley Thayer, Stephen Rosen and Azar Gat, my focus here is on works that use evolution metaphorically. Evolution has been used metaphorically in three contexts that interest us here: to account for large-scale transformations of the international system, to account for normative change in international politics, and, merging these two concerns together, to explain the transformation of the institution of sovereignty, the fundamental institution of the international system. More importantly, I will focus on the assumptions that IR scholars have made in creating the analogy between the biological realm

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698 Axelrod and Hamilton 1981.
701 Florini 1996.
and IR, and on the relationship between the structure of evolutionary explanation and IR ontology.

Evolution has offered us the most intuitive theory to think about macro-historical change in international politics. Given the dominant ontology of the international system as population and primary security environment, which I have discussed at length in the introduction, it is not so surprising that most theories of international system change are framed, explicitly or implicitly, in terms of Darwinian evolution. What makes them Darwinian is the manner in which they privilege the role of exogenous environmental pressures in shaping the system’s evolution. In an evolutionary perspective, environmental changes, channeled through the competition for survival, are expected to lead, over time, to fundamental changes in the units of the system.

Applications of evolutionary theory to the problem of international system change borrow from different strands of evolutionary biology and often incorporate additional assumptions to make the transition from the biological to the social realm. As I have suggested in the previous section, all evolutionary IR models share a focus on changes occurring in populations of individuals over time as a result of environmental pressures. Population thinking and the causal primacy of the environment are the hallmark of evolutionary models. More precisely, evolutionary IR models specify at least three elements: a population,

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703 See Florini 1996.
704 For a critique of the application of evolutionary theory to social evolution, see Fracchia and Lewontin 2006.
705 Depew and Weber 2011.
mechanisms of variation and selection, and assumptions about inheritance/stabilization.

First, evolution explains change in the composition of a *population* composed of many individuals over time. Evolutionary IR models have sought to explain how the sovereign state has become and remained the dominant form of global political organization. Tilly and Spruyt use evolutionary models to account for the relative success of the sovereign state over its contemporary competitors in the Early to Late Middle-Ages.\textsuperscript{706} Waltz uses Darwinian evolution to explain how, under anarchy, realist states will tend to be more successful and how, as a result, balances of power recur and anarchy is reproduced.\textsuperscript{707} Wendt uses a Lamarckian evolutionary model to account for the process through which different cultures of anarchy spread in the system.\textsuperscript{708} And Florini borrows from Dawkins’ focus on individual genes (‘memes,’ in a cultural context) and takes the population of norms as her units of analysis to explain how certain norms emerge and come to dominate discourse.\textsuperscript{709}

Second, the model must specify the mechanisms responsible for generating variation at the individual-level and environmental selection mechanisms that winnow this variation at the population-level. Tilly and Spruyt, for instance, propose a similar two-stage evolutionary story in which the breakdown of the

\textsuperscript{706} Tilly 1975, 1990; Spruyt 1994.
\textsuperscript{707} Waltz 1979.
\textsuperscript{708} Wendt 1999: ch.7.
\textsuperscript{709} Dawkins 1976. The most explicitly evolutionary discussion of normative change inspired by Dawkins remains Florini 1996. Outside of IR, influential work has been done by Boyd and Richerson 1988.
feudal order yielded alternative political organizations and the sovereign state was ultimately selected by the military and economic competition environments, which were themselves modified by important exogenous changes in military technology (in Tilly) and the volume of trade (in Spruyt).\textsuperscript{710}

Individual-level variation plays a necessary role in evolutionary explanation because without it, the environment has nothing to select from. A common critique of Waltz’s evolutionary model is that it does not posit variation; “states are functionally undifferentiated.”\textsuperscript{711} In fact, Waltz does not assume functional undifferentiation at all. Rather, his argument is that functional similarities between states are the \textit{product} of selection by the anarchic international system environment. Indeed, at a few places he reminds us that anticipative, rational, unitary adaptation to environmental constraints on the part of all, or even most states, is not necessary for his theory to work: all that he needs to assume is that states that adapt, either through rational calculation or mere “dumb luck” perform better than those that do not adapt.\textsuperscript{712} In true Darwinian fashion, Waltz assumes variation, but is not very interested the (domestic) mechanisms that generate it. More recently, a number of Realist scholars have sought, under the label of Neoclassical Realism, to integrate insights about domestic mechanisms of variation in foreign policy into a Waltzian framework.\textsuperscript{713}

\textsuperscript{710} Tilly 1975, 1990; Spruyt 1994.
\textsuperscript{711} See Gilady and Hoffmann 2013.
\textsuperscript{712} Waltz 1979.
\textsuperscript{713} On Neoclassical Realism and its relationship to structural realism see: Sterling-Folker 1997; Rose 1998; Schweller 2003; Rathbun 2008; and Lobell, Ripsman, and Taliaferro 2009.
In Darwinian perspectives on system change, thus, exogenous, ‘environmental’ (technological, economic, normative or other) changes are said to affect the costs and benefits of a given form of political organization. Maladapted organizations are expected to “fall by the wayside” and give way, over time, to better adapted ones. Organizations that ‘fit’ the new set of environmental demands should come to represent a greater share of the overall population.

If environmental selection is to remain the primary mechanism behind population change, however, Darwinians must assume that individual-level variation, although necessary, is somewhat random, in the sense of being undirected towards long-term fitness. Indeed, if variation is the result of straightforward adaptation to environmental pressures (as in rational learning), environmental selection becomes analytically unnecessary.

Naturally, applying evolutionary theory raises questions about whether these Darwinian assumptions make sense in a social context like IR, given the purposive and reflective character of human agency. As a result of this problem, Lamarckian models emphasizing the inheritance of acquired traits, which had been largely discredited in biology for a long time, now experience somewhat of a revival and are becoming increasingly popular in the social sciences in general, and in IR in particular. Given human agency, it is legitimate to ask whether all evolutionary models in the social sciences should be Lamarckian, and indeed,

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714 Waltz 1979.
715 Kahler 1999; Gilady and Hoffmann 2013.
Wendt has suggested that most applications of evolutionary thought to IR are already implicitly Lamarckian.\textsuperscript{716}

This does not necessarily have to be the case, however, since for Darwinian models to be applicable, all that we need to be able to assume is that individual intentions and organizational outcomes are decoupled to a significant extent, in the sense that individual-level adaptations do not correlate with population-level outcomes.\textsuperscript{717} In other words, to use Schelling’s distinction, as long as ‘micro-motives’ do not straightforwardly translate into ‘macro-behavior,’ Darwinian models remain applicable in social contexts.\textsuperscript{718} In practice, this condition has been fulfilled by assuming bounded rationality (myopic actors) and/or the constraining effects of organizational/institutional cultures and routines, and by referring to complex system dynamics that actors have a hard time predicting.\textsuperscript{719}

For instance, Waltz, whose evolutionary framework was faithful to Darwinism in a way that has not yet been properly appreciated, only makes minimal assumptions about states’ capacity to adapt: states can “do any fool thing,” but “they are likely to be rewarded for behavior that is responsive to structural pressures and punished for behavior that is not.”\textsuperscript{720}

Finally, evolutionary models specify forces of inertia that stabilize selected changes over time. Here, the debate is mainly over whether population-level changes are gradual, as in most Darwinian models, or abrupt and far between, as

\textsuperscript{716} This question is discussed at length in Gilady and Hoffmann 2013.
\textsuperscript{717} Hannan and Freeman 1989: 23.
\textsuperscript{718} Schelling 1978.
\textsuperscript{719} Kahler 1999: 193. On system effects, see Jervis 1997.
\textsuperscript{720} Waltz 1997: 915.
in Gould’s ‘punctuated equilibrium’ model. Models of gradual evolution see variation and selection as constantly working to produce slow and incremental change as the members of the population reproduce and die over successive generations. In punctuated equilibrium, however, only extraordinary environmental changes, or ‘shocks,’ can overcome conservative mechanisms and lead to meaningful change. Punctuated equilibrium assumes strong homeostatic tendencies in populations that make them resistant to change. Gilpin and Spruyt for instance assume a status quo bias in institutions – “institutions are sticky” – but suggest that large events can disrupt the given status quo.

A critique of evolutionary IR

The evolutionary perspective on international system change raises a difficult puzzle. Pressured by the forces of globalization, the state appears to be under serious challenge. Under these conditions, an evolutionary perspective that privileges environmental selection leads us to expect significant transformations in the international system. And indeed this is exactly what globalization theorists are suggesting: given the dramatic changes occurring in the environment of the international system, it should experience profound, epochal transformations. As Susan Strange puts it:

“That all or nearly all states should undergo substantial changes of roughly the same kind within the same short period of time is really a new phenomenon. Even the last big change in Europe, from

based on a feudal system of agricultural production to states based on a capitalist system of industrial production, was spread over two or three centuries. It did not take place as quickly or as evenly as the changes recently experienced by the vast majority of states over the last twenty or so years.”

Contra Strange’s expectations, however, in many significant ways, we have yet to witness changes in the international system remotely as profound as the transition from feudalism to the modern international system. Indeed, as I have already suggested in the introduction, the international system has proved remarkably persistent given the seriousness of the challenges it faces, especially at the level of its fundamental organization. Rather than withering away, the sovereign state systemic mode of global political organization has expanded to the point that it is now universal in scope, the territorial status quo has become more entrenched, the rate of state death among even the weakest states is virtually zero, and stateless people all over the world have no greater aspiration than to achieve statehood. Today, even the smallest states are reaping the membership benefits associated with the hottest corporate identity around. Against the globalization theorists’ expectation, despite the inhospitable environment globalization purportedly creates, it is great to be a state in the contemporary era.

While a few reviews have raised general problems with the application of evolution to IR, I focus on two problems that limit what an evolutionary perspective can tell us on the issue of international system change. First, I will

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723 Fazal and Griffiths 2014.
argue that evolutionary explanation is structured in such a way that it cannot answer our questions about the future of the system, and therefore, that while evolution raises the puzzle of the state system’s persistence in the contemporary era, it cannot offer a theoretically-consistent solution to the puzzle. Second, I will argue that evolution is unable to make sense of the endogenous relationship between the system and its environment that characterizes putative challenges to the state system. I will suggest that these two problems are the byproducts of evolutionary theory’s explanatory structure, and more specifically, to the manner in which it privileges and exogenizes environmental selection in its account of change.

_Evolution is blind to the future_

Evolution cannot answer burning questions about the future of the state system because, as a result of its explanatory structure, it is notoriously ‘blind to the future.’

Unlike development, where, as we will see, it makes sense to draw expectations about ‘normal development,’ speaking of ‘normal evolution’ is meaningless. As I will discuss in greater detail later in this chapter, in developmental theory, the concepts of ‘norms of reaction’ and ‘structural plasticity,’ which I introduced in chapter 3, capture the range of possible, normal adaptations that an organism is capable of under a given set of environmental conditions. Evolutionary theory, however, does not have a corresponding

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725 Dawkins 1986.
726 As we will see, this does not mean that development is teleological in a deterministic sense, however.
concept. As Gould puts it, if we ran the tape of evolution a number of times, the emerging system would look differently every time. Evolutionary theory is backward looking. It can explain past instances of evolutionary change by linking transformations to putative adaptive functions. The evolutionary analyst infers from the configuration of the environment the ‘problem’ that it presented the organism with, and from there, makes the argument that the change observed in the organism adaptively ‘solved’ the problem. However, modern evolution cannot be forward looking and give us any information about the future.

There are two main reasons for that. First, by breaking the organism down into discrete adaptations that it then reassembles in populations, it washes out the developmental constraints that could help it constrain the range of potential adaptations. Second, it posits that variation, the diversity of forms natural selection works with to produce evolutionary change, is the product of random copying errors (mutations) over successive generations, and not directed (purposive) adaptation.

Gilpin’s discussion of “systems change” in War and Change is illustrative of this weakness of the evolutionary perspective on international system transformation. In the book, he defines “systems change” in evolutionary terms as “change in the nature of the actors or diverse entities that compose an international system.” Gilpin believes that the issue of systems change is of crucial contemporary importance given the globalizing tendencies that could already be discerned at

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728 Gilpin 1981: 40.
the end of the 1970s. “This issue,” he writes, “is particularly relevant in the present era, in which new types of transnational and international actors are regarded as taking on roles that supplant the traditional dominant role of the nation-state, and the nation-state itself is held to be an increasingly anachronistic institution.”

Still, he does not devote much attention to this question; the book focuses on the conditions under which two other kinds of changes – ‘systemic change’ and ‘interaction change’ – occur. It is nonetheless possible to reconstruct Gilpin’s take on systems change from the few remarks he makes about it.

First, Gilpin frames the issue of systems change in evolutionary terms. On the one hand, he conceptualizes the international system as a population. “In speaking of the character of the system, we refer primarily to the nature of the principal actors or diverse entities composing the system” and “the character of the international system is identified by its most prominent entities.” On the other, he suggests, in true Darwinian fashion, that the study of systems change is really about “why one or another type of entity is best suited for a particular historical environment.” He explains systems change in the following passage, worth quoting at length:

“Although each political organization serves a general set of interests (protection, welfare, status), the particular type of

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729 Ibid: 41.
730 Systemic change is defined as “change in the form of control or governance of an international system” and interaction change is defined as “a change (taking) place in the form of regular interactions or processes among the entities in an ongoing international system.” Ibid: 40.
731 Ibid: 41.
732 Ibid: 41.
organization that best serves a specific interest depends on the nature of the interest and the historical circumstances. As interests and circumstances change, the type of organization that is required to secure and defend the interests of individuals also changes. Any development that affects the costs and benefits of group or institutional membership for particular individuals will bring about organizational changes. For this reason, a systems change relates to the cost/benefit aspects of organizational membership and the ways in which economic, technological, and other developments affect the scale, efficiency, and viability of different types of political organizations.”

In other words, environmental (technological, economic and other) changes affect the interests of political actors, that is, the costs and benefits, for them, of a given form of political organization, which leads to efforts on their part to change (or uphold) that organization accordingly, or, in other words, to transform (or maintain) the structure of the international system. It is important to note how political organizations themselves remain passive throughout this process. Like organisms in Darwinian evolution, they are mere effects of underlying environmental conditions (selection) and not themselves generative in any sense.

It is unclear, however, how this account can speak about the long term continuity (almost four centuries) in the basic organizing principles of sovereignty, given the magnitude of the transformations that have occurred in the system’s ideational and material environments during that period. As Gilpin himself recognizes, at the end of the 1970s, the state was already under tremendous pressure from the forces of globalization. Today, these pressures are at an all-time high, with new challenges such as global warming and global terrorism, for example,

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733 Ibid: 42. Emphasis added.
increasingly exposing some of the weaknesses of the inter-state systemic mode of
global political organization. How does Gilpin expect the sovereign state system
to fare in the face of these ‘turbulent’ times? Gilpin dedicates only one paragraph of his book to this issue.

“It may be correct that a systems change is called for in the contemporary world. Certainly the development and proliferation of weapons of mass destruction necessitate a more stable and more peaceful system or world order; also, the forces that threaten global economic welfare cannot easily be contained by highly competitive and nationalistic nation-states. Yet, even though such a change in economic and political arrangements might be highly desirable, it would undoubtedly be a very costly matter, as was the prior shift from feudalism to the nation-state. Unfortunately (or, perhaps, fortunately), no contemporary political entrepreneur appears to regard forcing the transition from the nation-state to some other basis of world economic and political order as a profitable proposition.”

Gilpin agrees with the globalization theorists’ proposition that a systems change has been made necessary by globalization. Realizing that a systems change does not appear to be underway, however, his theoretical framework leaves him no choice but to suggest that it must be because political entrepreneurs perceive change as “too costly.” His theory, however, has nothing to say about the determinants of cost perception, which undoubtedly explains the paucity of his answer. Because it merely patches a hole in his argument that does not further

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734 Rosenau 1990.
our understanding, from a Lakatosian perspective on scientific progress, this can only be interpreted as an *ad hoc*, degenerative auxiliary hypothesis.\(^{736}\)

In order to account for systems stability in a theoretically-consistent manner, he would have to show that for the last four centuries, the costs of maintaining the status quo have remained lower than the costs of changing it. Yet, his whole theoretical apparatus rests on the claim that “the tendency is for the costs of maintaining the status quo to rise faster than the capacity to finance the status quo.”\(^{737}\) And indeed this is exactly what the globalization theorists are saying: the status quo has become too costly to maintain and the existing system has ceased to be functional following important and rapid environmental changes.

If a systems change is called for, it is because the status quo has become too costly to maintain. As such, what needs to be explained is what makes it possible for a costly and dysfunctional system to appear less costly than other costly but potentially more functional systems. To his credit, he is candid about this limitation of his framework when dealing with prospective transformations: “although we observe international crises and corresponding responses in the behavior of states, it cannot be known in advance if there will be an eventual return to equilibrium or a change in the nature of the system. The answer is dependent, at least in part, on what individuals choose to do.”\(^{738}\) Individuals are the source of variation (institutional innovation) in Gilpin’s evolutionary model.

\(^{736}\) Lakatos 1970.
\(^{737}\) Gilpin 1981: 156.
\(^{738}\) Ibid: 47.
of change, and in Darwinian fashion, Gilpin assumes that the process generating variation is random, or that it simply falls outside of the scope of the theory.

The key puzzle about systems change today is to account for the sovereign state system’s puzzling success since the end of the Second World War, that is, as I have already discussed, its persistence, expansion and consolidation, despite dramatic challenges from its environment. While an evolutionary perspective effectively raises this puzzle, it cannot solve it with its own theoretical resources. From a *strictly* evolutionary perspective, the international system *should* have changed fundamentally given the magnitude and pace of the changes that have occurred in its environment. Both Darwinism and Lamarckism expect large scale environmental changes to produce evolutionary change. That it has not is anomalous from a strictly evolutionary perspective.

In *The Sovereign State and Its Competitors*, Spruyt goes beyond Gilpin’s framework and offers what arguably constitutes the state-of-the-art evolutionary argument about the origins of the sovereign state system. Spruyt’s wager is that insights into contemporary and future transformations of the state system can be garnered by investigating the evolutionary origins of the state system. “I have written this book,” he writes, “because I believe that an analysis of the emergence of the state system and its continued existence suggests one way to think about the contemporary changes in a systematic manner.”

Unlike Gilpin, who takes a traditional Darwinian perspective, Spruyt borrows from the evolutionary

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biologist Gould’s punctuated equilibrium model of evolution. As discussed earlier, punctuated equilibrium models evolution in two stages. In the first stage, a given equilibrium is broken by an external shock which prompts the appearance of multiple, randomly produced adaptations. Then, in the second stage, these alternatives compete and the fittest among them is selected, bringing the population into a new equilibrium, until a new exogenous transformation capable of shocking this equilibrium occurs.

Spruyt argues that the exogenous shock that punctured the feudal equilibrium was the rise of long-distance trade between the 11th and 14th centuries. This shock prompted a reorganization of political coalitions across Europe and led to the emergence of three distinct forms of polities – sovereign states, city states and city leagues – which all represented organizational improvements relative to the feudal mode of organization. Over time, however, the sovereign state proved fitter than its contemporaries and gradually weeded out its competitors, leading to the emergence of the modern state system.

What does this account of the international system’s evolutionary origins tell us about its future? On this question, Spruyt’s evolutionary perspective can tell us very little. Spruyt’s arguments are most compelling when he is looking backward. While he succeeds in explaining how the feudal order collapsed and how the sovereign state beat its contemporary competitors, he does not clearly specify the conditions under which the sovereign state system can reproduce itself and the

740 Ibid.
conditions under which it will be unable to do so. As a result, he cannot tell, on his own theoretical terms, which contemporary or future external shock will punctuate the current equilibrium. Indeed, as I have already suggested, it is hard to deny that the contemporary maelstrom in the system’s environment is both greater and unfolding at a dramatically faster rate than the changes that rocked the feudal world. Why has the sovereign state system proved so resilient in the face of challenges such as the nuclear revolution and the globalization of the world economy, which are all occurring simultaneously over a few decades, while the feudal order collapsed in the face of canon powder and the rise of trade over the span of three centuries?

Since the establishment of the sovereign state system, a number of tremendous environmental changes could have constituted system-transforming shocks, such as Napoleonic France, the industrial revolution, two world wars, the nuclear revolution, the globalization of the world economy, decolonization, the democratic revolution, the internet, and the climate change crisis, to name but a few. It would be difficult to argue that the rise of trade constitutes a more serious ‘shock’ than these, especially if we consider, as Strange has alluded to, the velocity, simultaneity and force of those changes since the end of the Second World War. Yet the sovereign state system equilibrium has not been punctured and has instead expanded and in many ways consolidated. Alternatives have not solidified or even emerged, even at key critical junctures that could have made fundamental change possible, such as the waves of decolonization that followed the end of the Second World War and the creation of a number of new states.
following the demise of the Soviet Union. Instead of changing fundamentally and radically, the system has not only expanded to the point it is now universal in scope, but it has also become more entrenched than ever. From an evolutionary perspective, the persistence, universal expansion and consolidation of the state is a serious puzzle: dramatic changes in a system’s environment, such as the tidal wave of changes witnessed since the last world war, should prompt evolutionary changes. The puzzle, however, turns into a serious anomaly for an evolutionary perspective on system change, because it cannot solve it within its own theoretical terms.

The key question is what made it possible for the sovereign state system’s fundamental organization to survive comparatively more dramatic changes occurring in a much shorter time span? What makes the sovereign state system so resilient compared to the feudal system? Answering this question necessitates looking into the organization of the state system and the mechanisms through which it adapts to its environment. Unlike Gilpin, Spruyt does attempt to address these questions, but to do so he must reach out to another body of theory, sociological institutionalism. In addition to the selection of successful types (by war and by imitation), sovereign states defeated their contemporary alternatives by excluding them. Through mutual recognition and mutual empowerment, sovereign states have progressively eliminated alternative actors. Although he does not spend more than a few pages on this issue and does not spell out the alternative structural understanding of the international system that his argument implies, as I have done in chapter 4, Spruyt appears to be arguing that
the international system superorganism has emerged much earlier, long before Westphalia.

Borrowing from the latest thinking in evolutionary theory, I have given reasons why the transition to individuality in the international system needs to be dated much more recently, at least at the Congress of Vienna but really consolidating after WWII. While Spruyt identifies the emergence of mutual recognition dynamics in the 14th century, this interpretation misses how mutual recognition only fully meant collective consciousness and intentionality at the Congress of Vienna. Before Vienna, mutual recognition was particularistic; it was not based on established and/or abstract principles. What the change that occurred at Vienna signifies for the system is that the system shifted from a group of essentially self-regarding states to an organized collective of system-regarding states. States became self-conscious members of a very select group, and began practicing a policy of social closure, excluding alternative actors.

I do not want to engage too deeply with this historical dispute here, but simply want to highlight how Spruyt’s approach only provides us with half of the answer. Indeed, even if we acknowledge the presence of exclusionary practices of mutual recognition early in the history of the international system, Spruyt never draws, as I have done, the full implications of this shift. As I have argued in chapter 4, once a system of mutual recognition and empowerment capable of excluding alternative types has been established, we are dealing with an individual and need to update our theories of change accordingly. From that moment on, the
system is not simply a population of individual states subject to evolutionary
dynamics. In the language of modern biology, what happens with the emergence
of sovereignty is a METI. Becoming an individual means that in order to
understand its future transformation we will have to pay attention to its
development. In other words, Spruyt’s wager that understanding the evolutionary
origins of the international system will yield insights about its future only gives us
half of the answer. For the other half we need a developmental theory. A
developmental account will have to build on a structural account of the
international system that takes into account the unique organization of
sovereignty that I have described in chapter 4.

*Evolution elides mutual system-environment construction*

A second weakness of evolutionary theory is that it cannot elucidate the relations
of mutual construction between a system and its environment. As I have
suggested earlier, traditional evolutionary theory establishes a sharp distinction
between organisms and their environment, treating the former as passive and the
latter as a set of exogenous pressures. As a result, it cannot comprehend the
complex relationship between the system and its environment that characterizes
some of the most important challenges associated to globalization. Indeed, as I
have suggested above, the environmental changes that challenge the state system
in the globalization era are not exogenous to the system. The globalization of
world markets, the nuclear revolution, the rise of violent non-state actors and
global warming are all products, some intended and some unintended, of the activities of the state system.

Florini’s theory of normative evolution, the most explicit use of Dawkins’ gene-eye account of evolution in IR, illustrates the difficulty neo-Darwinian evolution has in dealing with system-environment endogeneity. Florini departs from other evolutionary accounts of international system transformation in that she looks at variation, selection, and inheritance dynamics occurring at the level of populations of norms, which she compares to genes, rather than populations of actors. Making use of Dawkins’ concept of meme (the cultural equivalent of the gene) and borrowing from the works of socio-biologists Robert Boyd and Peter Richerson, the analogy Florini proposes is between international norms such as territorial integrity and genes as instructional units. The analogy between the evolution of norms with the evolution of genes is possible, she argues, for three reasons: norms, like genes, carry instructions for their host; norms, like genes, are inherited, via cultural transmission; and norms, like genes, are contested: they compete with other norms or genes carrying incompatible instructions. Populations of norms, Florini argues, exhibit the evolutionary triad of variation, competition (selection) and inheritance, and thus, we should expect evolutionary processes to take place in them. As Florini puts it:

“Because contested norms must compete for time and attention, just as genes compete for slots on chromosomes, both are subject to the forces of natural selection, and their prevalence in a population waxes and wanes over time. These changes in the relative frequencies of genes or norms constitute evolution: as the relative
frequencies change, so do the corresponding characteristics of the population.”

The main reason Florini adduces for focusing on norms-as-genes, or memes, and not states-organisms as the unit of selection, echoes some of the arguments that I have made in chapter 2: the turnover among states today is not great enough to justify the use of natural selection at the level of individual states.

“In the state system, evolution primarily occurs not by wiping out some states and replacing them with others having different characteristics, but by supporting nonrandom changes in the behavior of existing states – that is, by rewarding the behaviors that express certain norms and penalizing other behaviors, but with penalties that fall short of the ultimate penalty of extinction. In the era of trading states and prohibitions against interstate aggression, when war among major powers is no longer the primary means of international change, this level of analysis is less useful.”

Florini recognizes the importance of the transformation of international politics that I have described as a METI in chapter 2. Yet, she does not draw the same conclusion about the proper way to think about international systemic change after this transition, and therefore elects to borrow from a neo-Darwinian evolutionary model. As I will show, however, this choice forces her to make ad hoc adjustments to her basic model model that, I believe, ultimately demonstrate its inappropriateness.

Florini identifies three factors that account for the ultimate selection of a norm: the prominence of the norm among other norms in the ‘norm pool’; the compatibility of the norm with the ‘normative environment’; and favorable

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material environmental conditions. The first factor, norm prominence, which she describes as the promotion of the norm by influential norm entrepreneurs, notably powerful states, is straightforward: mutations occurring in organisms that reproduce more frequently have a higher likelihood of spreading in the population.

The second factor, compatibility with the normative environment is an interesting argument, as it adds an ideational dimension to her understanding of the environment, a sensible move given her focus on normative evolution. What is more, this is a move that is consistent with Dawkins’ arguments about genetic evolution. While genes compete with some genes (their alleles) over a given chromosome slot, other genes “are just a part of its environment, comparable to temperature, food, predators, or companions.” “The whole set of genes in a body,” he writes, “constitutes a kind of genetic climate or background, modifying and influencing the effects of any particular gene.” 743 Here, it might seem as if Dawkins and Florini are acknowledging something similar to the notion of developmental constraint that I have discussed earlier. 744 They are, but in a very thin sense. Indeed, to view ‘other genes’ as part of the environment of the individual gene is to treat them as exogenous constraints, albeit very vague ones, especially in contrast to the kind of endogenous and systemic-functional constraint a developmental perspective suggests (a claim that will become much

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Florini explains how the normative environment selects as follows:

“Because most existing norms are codified in international law, emerging norms must make the case that they are logical extensions of that law – or necessary changes to it. Indeed, a vast amount of international negotiation is in essence argument over whether specific potential new norms are acceptable extensions of the existing normative framework embodied in international law. Such negotiations constitute a key selection mechanism for norms. Norms that are highly coherent within the international legal framework will be far more resistant to change than those that are not so linked.”

Florini clearly recognizes that the international system today has a normative structure, built around international law, which constrains the kinds of norms that can emerge and flourish in international politics. However, because she treats this normative environment as exogenous to the emerging norm under study, she can say very little about which kinds of norms will emerge and which ones will succeed.

If international negotiations are, as Florini herself suggests, about the proper extension of international law, in what sense can international law be theorized as an exogenous environment selecting the new norm? To borrow the language of practice theory, if, when devising new norms, international actors think from the practice of international law when they think about norm extension, should not the new norm be seen as the product of the international legal system? In other words, what Florini describes as an exogenous constraint actually appears to be a

variation story (how new norms emerge from legal argument) rather than a selection story (how new norms survive in the legal environment).

Is evolution the proper way to think about normative change? In order to begin talking about normative evolution, we need to break down normative systems into norm populations and environments. However, doing so comes at a cost: we lose sight of the organization, structure and processes of norm construction (recall that legal scholars increasingly think about the law itself as an autopoietic system). As Fracchia and Lewontin argue, this is a problem that plagues most accounts of cultural evolution:

“Because of its inescapable methodological individualism and the methodological randomness it spawns, the selectionist paradigm produces a massive blind spot toward the logic of social relations and socially-structured antagonisms; it reduces the social conflict produced by those antagonisms to the indifferent difference of competitive selection; and it fails to realize that the greater “success” or “fitness” of certain memes/practices is not a mere matter of random variation. The survival or “selection” of unfit practices is a necessary part of the social relations of inequality and of the social reproduction of the “fittest.” This is not just an idiosyncrasy of, a “disanalogy” between, social and cultural as opposed to biological evolution. The active reproduction of “unfit” practices and memes is rather constitutive of the entire process of social reproduction.”\textsuperscript{746}

What is missing from Florini’s account is the \textit{generative} logic of normative evolution. Because it exogenizes the environment and assumes random variation, however, Dawkinsian evolution cannot serve as a foundation for such an account. Indeed, the main limitation of the evolutionary IR perspective is that in order to

\textsuperscript{746} Fracchia and Lewontin 2005: 23.
see the international system as an evolutionary ‘population,’ it has to wash out the important systemic and organizational character of states, the international system, and in this case, the international legal system.

Going back to the theory outlined in chapter 4: instead of thinking about new norms as selected by the international legal framework, understood as an exogenous environment, perhaps we should instead think about the new norm as changes in the structure of the system that are the products of the self-producing process of international sovereignty. In other words, I am suggesting that normative transformations, especially in cases where extensions of international law are being negotiated, are better captured by a developmental story than by an evolutionary one.
In this chapter, I introduce and outline a new developmental perspective on international system transformation that not only constitutes the logical extension of the evolutionary and physiological arguments I made in the previous chapters, but that solves many of the key issues raised by existing evolutionary perspectives on international system change.

Towards a developmental perspective on international system change

A developmental perspective has much to offer to IR, especially on the issue of international system change, where it offers theoretically-consistent solutions to the very same problems that plague the evolutionary perspective. In biology itself, development is experiencing a significant revival and is in the process of revolutionizing the way biologists think about biological change, including evolutionary change (the flourishing EvoDevo research program). For a

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747 See Depew and Weber 2011.
number of reasons, however, unlike its evolutionary counterpart, the insights of developmental biology have been virtually ignored in IR.\textsuperscript{748} This is not to say that the word ‘development’ is never employed, but rather, that it has never been explicitly theorized as a general perspective on system change in IR. In fact, take a cursory look at almost any work of IR on the issue of change and you will find that the word ‘development’ is used quite frequently.

In political science and IR in particular, the term development is frequently used casually and indiscriminately, often as synonym for change and even, sometimes, evolution.\textsuperscript{749} Examples abound, and citing a few will suffice to make the point. Take the following excerpt from Douglas North’s classic book on institutional change: “the incentive structure provided by the basic institutional framework creates opportunities for the consequent organizations to evolve, but the direction of their development has not been to promote productivity-raising activities.”\textsuperscript{750} In an article in which she fleshes out one of the most explicitly evolutionary theory of normative change in IR, Florini suggests that her “evolutionary argument ... draws an analogy between genes and norms to provide new insights into the development of norms.”\textsuperscript{751} And in their influential, programmatic volume on international practices, Adler and Pouliot argue that the recursive character of practices can be captured by “the evolution of a specific

\textsuperscript{748} The main reason is probably that developmental biology was left out of the modern ‘neo-Darwinian’ synthesis that merged Darwin’s theory of natural selection with Mendel’s theory of genetics.
\textsuperscript{749} One exception is Alex Wendt’s world state argument which briefly discusses development, in Wendt 2003.
\textsuperscript{750} North 1971: 109-110.
\textsuperscript{751} Florini 1996: 364.
practice – that is, its dynamic historicity and contingent processes of transformation over time and space. The focus here is on a practice’s lifecycle, which includes, in its ideal-typical form, the generation, diffusion, institutionalization, and fading of a particular competent performance.” “The lifecycle of practice,” they then clarify, “is not a teleological framework, but a genealogy of the development, however arrested it may be, of a meaningful activity.”

In modern biology, however, evolution and development are carefully distinguished; they involve very different units of analysis, concepts, mechanisms, and theories. As I have already discussed in some length, evolution is about the changes a population of individuals undergoes as successive generations of its members reproduce and die. Its explanatory structure emphasizes the role of environmental selection mechanisms in producing change, at the expense of the organism, which is cast into a passive role. A modern perspective on development, on the other hand, is about the transformations an individual organism undergoes during its lifecycle. Its explanatory structure endogenizes the relationship between the changing organism and its changing environment, capturing their recursive and cyclical relations of mutual construction.

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752 Adler and Pouliot 2011a: 19.
753 Sansom and Brandon 2007. However, this disciplinary divide is in the process of being bridged by the EvoDevo research program.
The progressiveness of a developmental perspective on international system change

A developmental perspective offers potentially interesting solutions to the problem of international system change under globalization. Indeed, not only does it add a temporal dimension to the physiological perspective of Part B, but by the same token it promises to address headfirst the two problems of international system transformation outlined above.

First, unlike evolution, which is notoriously “silent about the future,” a developmental perspective can say a “small number of big and important things”\(^{754}\) about the future of a system. With the help of concepts like ‘norms of reaction’ and ‘structural plasticity’, developmental theorists can specify the range of ‘normal’ adaptive changes an organism is capable of in a given environmental setting. As in any complex system, developmental systems exhibit an important stochastic element that forces us to speak about expected developmental outcomes in non-deterministic, probabilistic terms. Indeed, each developmental step changes the environment the organism lives in and the kinds of problems its environment poses, sometimes in unintended and potentially harmful ways, thus adding greater indeterminacy to our initial expectations with each subsequent developmental cycle.

This last characteristic, however, makes development an attractive approach to deal with the endogeneity we observe between the international system and some

\(^{754}\) To echo Waltz 1986: 329.
of the most prominent challenges associated to globalization. Indeed, developmental systems can capture the two-way, recursive relationship between the system and its environment. In a developmental perspective, the organism adapts to its environment by transforming itself and/or its environment, and the development of the organism generally goes hand in hand with an increase in its capacities do control and manage its environment. When I put my daughter on her stomach and stimulate her by placing a toy slightly out of her reach, her efforts to beat gravity to reach the toy should, if her development is normal, lead to muscle and motor development that will eventually enable her to crawl and walk. The ability to crawl and walk will, in turn, enhance her ability to manipulate her environment and as a result, transform the meaning of her environment for herself, introducing new challenges, for example learning how to skate, thus literally broadening her horizons.755

Development is not only about how an organism changes in response to an environmental challenge. In the process of transforming itself to address an environment challenge the organism creates new sets of challenges. The process of development is thus a recursive process of mutual construction between the organism and its environment. In many cases, an organism will face and be forced to adapt to environmental pressures that are the product of its own activities. Cases like the globalization of the world economy or the nuclear revolution, in which the environmental challenge is the product of the activities

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755 Recall from the previous chapter that the environment of an organism only has meaning in light of the organism’s structure at any given time.
of the system, fall within the purview of a developmental systems perspective that endogenizes system and environment in the production of development.

Finally, cases like the international system’s puzzling persistence, growth and consolidation in the face of a challenging environment fall squarely within the explanatory purview of a developmental perspective. Evolution, which expects environmental changes to prompt changes in the system over a sufficiently long period of time, can only be puzzled by many of the continuities we actually observe in the system. Development, however, is an inherently conservative process. Organisms exhibit a conservative bias in their development: when facing challenges from their environment, organisms change their structure and their environment in order to stay the same at the level of their fundamental organization. ‘That which does not kill us makes us stronger.’ What constitutes a nagging anomaly for traditional evolutionary perspectives actually represents a normal research problem for development.

A short introduction to developmental thinking in biology

Evolution and development are both historical models of biological change, but as I have suggested above, their explanatory structure is very different, reflecting to a large extent their different subject matter. Evolution is about changes in populations of organisms or genes over successive generations and development is about change in individual organisms over the course of their lifecycles.

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756 Nietzsche 2007: 5.
A familiar and influential way of framing development is the ‘nature or nurture’ debate, which is generally framed in biology in terms of the relative weight of genes or environment in accounting for development. The dichotomy is a familiar one, and informs many contemporary issues with important ethical implications:

“Are there ‘genius’ genes? If not those, then surely ‘gay’ ones? Is aggression the consequence of social and economic conditions, or is it a product of evolution? Are cognitive differences between men and women due to genetics or upbringing? Can we shape our destiny, or are we robots programmed by our selfish genes?”

I begin my discussion of development by introducing two classic images of the process: preformationism and epigeneticism. Each offers different answers to the nature-or-nurture issue. Then, after introducing the genetic determinist, preformationist perspective on development the modern synthesis has fostered, I critique this perspective and introduce an alternative, Developmental Systems Theory (DST). DST is an emerging perspective that transcends the nature-nurture dichotomy by endogenizing genetic, environmental, and other determinants of development in a complex systems perspective.

Two images of development: preformationism and epigeneticism

The two major perspectives on development in the history of developmental thought are preformationism and epigeneticism. The first, preformationism, sees the embryo as a miniature version of the adult organism (the homunculus, or ‘little man’). Development, in this view, is simply the complete realization of an incipient form in the embryo, and thus, represents nothing more than growth.

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The other image, epigeneticism, views development as a series of progressive changes that are the product of the interaction between the organism and its environment. In this context, ‘progressive’ simply means that each new step in development proceeds from prior, simpler stages: development is not only growth, but also a process of differentiation.

Epigenetic thinking takes one of two forms: additive interactionism and constructivist interactionism. The first typically answers the nature-nurture problem by specifying the proportional role played by genes versus environment in the development of an individual organism. This perspective is additive in the sense that it makes claims such as “behavior X is one-third genes and two-thirds environment.” Epigenesis, in this case, simply means “all processes in forming the phenotype other than genetic transcription and translation.” The second perspective looks at the organism and its environment as constituting one complex developmental system. The two most influential perspectives in this vein are the theory of self-producing (or autopoietic) systems, which I have discussed at length in chapter 3, and DST, which I will discuss shortly.

Given the importance afforded to the environment in evolutionary thinking, one would think the epigenetic tradition would have been privileged by evolutionists, but this has not been the case at all. The perspective on development advanced by evolutionary biologists is surprisingly preformationist. “There is no essential difference, but only one of mechanical details,” as Lewontin puts it, “between the

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view that the organism is already formed in the fertilized egg and the view that
the complete blueprint of the organism and all the information necessary to
specify it is contained there.”

This speaks to the influence of the modern synthesis, which has thoroughly
deconstructed development. Recall that in this genetic reductionist view of
evolution, the environment does all the work, albeit at the level of the genotype.
The life history of the individual organism, its continuous interaction with its
environment over the lifecycle, does not matter, because information is not
transmitted back from phenotype to genotype (a phenomenon otherwise known
as Weismann’s barrier).

Beyond the influence of the truncated view of development under the modern
synthesis, the term development itself contains a linguistic bias towards
preformationism, as it connotes an ‘unfolding’ of something. The picture of
development as ‘unfolding’ over time is an influential picture of development. As
Lewontin suggests,

“The term development is a metaphor that carries with it a prior
commitment to the nature of the process. Development (svillupo in
Italian, desarrollo in Spanish, Entwicklung in German) is literally
an unfolding or unrolling of something that is already present and
in some way preformed. It is the same word that we use for the
process of realizing a photographic image. The image is already
immanent in the exposed film, and the process of development
simply makes this latent image apparent.”

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761 Ibid: 5.
In the following section, I review how the modern preformationist perspective came to dominate developmental thinking, and then move on to discuss DST, an emerging epigeneticist perspective.

*The deconstruction of development in the modern synthesis*

Since evolution has been so influential, both inside and outside biology, much of what we intuitively know about development has been tainted by the evolutionary worldview. Development was significantly marginalized the modern evolutionary synthesis. What is meant by that, however, is not that the existence of development dynamics was denied, but that the process was ‘deconstructed’ in such a way that it came to be seen as relatively unimportant in comparison to evolutionary processes. The impoverished perspective on development viewed organisms “as collections of discreet adaptations, each of which is ‘read out only’ from segments of genome conceived as instruction manuals, blueprints, or computer programs for making organisms.” Depew and Weber call this set of reductionist assumptions,

“shows a marked tendency to reduce development itself to machine-like assembly – print out, as it were, from genetic blueprints – and to assert that the theory of natural selection in its most general, law-like formulation does not apply any more properly to organisms than to any other entities that exhibit variation, heritability, and selection – computer programs for example.”

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762 Depew and Weber 2011: 98.
763 Ibid: 95.
764 Ibid: 98.
This view was supported by the findings of molecular biology, namely Weismann’s barrier and the Central Dogma. Indeed, “a traditional way to privilege genes over other causes in development is to argue that genes are the only things organisms inherit from their ancestors. Hence the biological nature of organisms must be in the genes.”\textsuperscript{765} And until the advent of modern computers, it was also more mathematically tractable: gene frequencies in a population are easier to deal with than populations of organisms, each of which engaged in particular, complex, mutual and recursive system-environment interactions.

The genetic reductionist and determinist view of development culminated with the Human Genome Project (HGP). Between 1990 and 2003, the HGP was an enormous collaborative international effort to map the full sequence of human DNA. It was the largest such project in the history of biology, and also undoubtedly one of its most successful from a scientific and even economic standpoint.\textsuperscript{766} What interests me here, however, is the particular, reductionist perspective on development that underlies the HGP.

The reductionist and determinist spirit of the HGP echoes Pierre-Simon Laplace’s ‘demon’ – his claim that if we knew the nature, position and velocities of all of the atoms that compose the universe at a given point in time, a higher intelligence (the demon) could recapitulate the past and predict the future.\textsuperscript{767} Lewontin recalls how, echoing Laplace, “one of the most eminent molecular biologists,
Sydney Brenner, speaking before a group of colleagues, claimed that if he had the complete sequence of DNA of an organism and a large enough computer then he could compute the organism.768 Similarly, Walter Gilbert, another prominent molecular biologist, claimed that once we would have completed the sequence of the human genome, “we will know what it is to be human.”769

Instead of giving us the ability to compute the human organism, however, the HGP has actually revealed the complexity of the relationship between genomic and phenotypic expressions. For example, it led geneticists to discover the importance of Hox genes, which act like a switch, activating genes (or not) depending on environmental circumstances. Instead of ‘gene action’, these findings suggest that is more appropriate to talk of ‘gene activation.’770 These findings suggest that differences in species may have less to do with differences in genotype than with differences in how the same genes are expressed differently in different developmental contexts. The HGP also led to the discovery of evidence supporting the long controversial ‘Baldwin Effect,’ the transmission of information from phenotype to genotype, which was long deemed impossible under the Central Dogma.771 This evidence suggests that what happens in the course of development matters to evolution as well. These findings about the complexity of developmental processes have fueled the EvoDevo research program.

768 Lewontin 2000: 10.
769 Cited in Ibid: 11.
770 Keller 2009.
771 For a summary of these findings, see Depew and Weber 2011: esp. 95-96.
As I have already suggested, the impoverished view of development presented by the Neo-Darwinians explains to some extent why development has not seemed very interesting to social scientists. Indeed, in the genetic deterministic view on development, all the interesting variation is accounted for by evolution. If development is simply the realization of the genetic blueprint, once you know the genotype, you know the interesting bits of the life history of the organism. And since all of the variation in the genotype is accounted for by evolutionary processes, then why should we care about what occurs in the course of the organism’s life.

The reconstruction of development by Developmental Systems Theory

In recent years, however, the reductionist take on development has been challenged from a number of directions. These different empirical findings and theoretical critiques have been reconstructed into a coherent view of the biological world under Developmental Systems Theory (DST). DST takes an epigenetic approach but goes beyond additive interactionism (it has been labeled the ‘new epigenesis’).

“If we take as seriously as we should the fact that organisms develop,” proponents of DST argue, “we must regard them as epigenetically constructed in each generation from a large array of developmental resources, some heritable, some not, rather than as read out or printed out from a causally primary, quasi-preformationist genetic program.”

Scholars working

772 Keller 1995.
773 Weber and Depew 2001: 239.
within the DST movement play off this unifying, central “antipreformationist” theme.\footnote{774}{Godfrey-Smith 2001: 283.}

Three problems with the reductionist perspective motivate DST: the multiple realizability of the genotype, the complex organization of development, and the recursive, dialectical relationship between the organism and its environment in development. Each problem points to the need for a more complex, holistic, systems view on the development of an organism than the reductionist image of development as the mere realization of a genetic blueprint.

First, an important problem for the genetic reductionist account of development is that the genotype is multiply realizable in different environmental contexts. Multiple realizability arguments constitute the traditional philosophical attack against reductionist claims.\footnote{775}{Sober 2000: 301.} A given genotype can be expressed differently in different environments (and this is without counting on random developmental ‘noise’). Going back to my discussion of self-producing systems, the organization of such systems can be realized through different structural states. This is captured by the concept of ‘norms of reaction,’ which is the “mapping of environment into phenotype that is characteristic of a particular genetic constitution,” “a pattern of different developmental outcomes in different environments.”\footnote{776}{Lewontin 2000: 23.}
Second, genetic blueprints are not realized in a straightforward fashion during development. “The trouble with the general scheme of explanation contained in the metaphor of development,” as Lewontin puts it, “is that it is bad biology. If we had the complete DNA sequence of an organism and unlimited computational power, we could not compute the organism, because the organism does not compute itself from its genes.” What is more, DST views genes as only one of a number of interacting, developmental resources. Genes cannot produce anything without the help of other developmental resources.

I have already discussed developmental constraints, which point to the importance of the organism’s organization in development. DST understands development as progressive self-differentiation. Progressive, here, does not denote normativity but merely suggests that the new is built on top of and from the old.

“Organisms come to be not as assemblies of parts but as integrated substances in which change at any stage of development is efficiently caused by the state of the embryo at the immediately preceding stage, the entire process repeating itself in acts of reproduction seen as the culmination of development itself.”

Finally, but most importantly, unlike the impoverished view of the relationship of the organism to its environment drawn by the modern synthesis, in DST organisms construct their environment and environments construct organisms in

777 Ibid: 17.
780 Ibid: 99.
a continuous dialectical relationship. Lewontin clarifies the notion of the environment in a passage worth quoting at length:

“Just as there can be no organism without an environment, so there can be no environment without an organism. There is a confusion between the correct assertion that there is a physical world outside of an organism that would continue to exist in the absence of the species, and the incorrect claim that environments exist without species. The earth will precess on its axis and produce periodic glacial and interglacial ages, volcanoes will erupt, evaporation from oceans will result in rain and snow, independent of any living beings. But glacial streams, volcanic ash deposits, and pools of water are not environments. They are physical conditions from which environments may be built. An environment is something that surrounds or encircles, but for there to be a surrounding there must be something at the center to be surrounded. The environment of an organism is the penumbra of external conditions that are relevant to it because it has effective interactions with those aspects of the outer world.”

Lewontin identifies two key relationships between organisms and their environments that a genetic reductionist view on development ignores: organisms determine what the environment is and the character of environmental stimuli; and organisms construct and constantly alter their environment.

First, organisms determine what the ‘environment is’ in the sense that they determine what aspects of the external world is relevant to them. Environments, as the term suggests, ‘surround.’ The meaning of an environment is not an objective fact but a subjective one. Whether an environment is too cold or too hot for a given organism depends on the range of temperatures that the organism can

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tolerate (i.e. in which it can continue to maintain homeostasis). As I discussed in detail in chapter 3, organisms give meaning to environments. “Organisms do not adapt to their environments; they construct them out of the bits and pieces of the external world.”\textsuperscript{782} The organism’s ‘environment’ and the ‘external world’ are not the same thing.

Second, organisms construct environments for themselves. In some cases, they actively modify their environment to make it more favorable to their survival: beavers build dams, termites build elaborate mounds, birds build nests, human beings build cities, etc. More fundamentally, all organisms modify their immediate environment by their mere presence. For example, our body produces a film of warmer air that surrounds us and insulates us from the external environment. Wind chill occurs when this cocoon is blown away by strong winds. By adapting to their environment, organisms also constantly, and often unwittingly, alter this environment and can even sometimes be responsible for creating their own hostile environment. For example, insects adapting to pesticides lead farmers to further increase the frequency and intensity of pesticide treatments of their fields (through a sort of ‘Red Queen effect’).\textsuperscript{783}

In sum, DST points to the need for a whole-organism approach that is sensitive to the manifold relationship of the organism with its environment and the recursivity of development cycles. At any given point in time, an organism’s constitution generates environmental challenges for that organism. The organism

\textsuperscript{782} Ibid: 64.
\textsuperscript{783} Ibid.
develops in response to these challenges, using its own resources and resources from its environment to do so. In the process of developing this way, the organism has changed the meaning of its environment, which then presents it with new problems to solve. This recursive process can be broken down into developmental cycles, which will add up to the individual’s lifecycle.

The marginalization of development outside of biology

Despite its comparative advantage over evolution on the questions that interest us about international system transformation, development has been almost completely ignored in IR and has remained generally neglected the rest of the social sciences. Why? The reasons are historical and sociological. As Miles Kahler perceptively puts it, “the privileging of particular approaches to international relations may result from both an internal logic of scholarship and from the social and political context of intellectual production.”8 In this section I discuss three reasons why I believe development has been ignored as a full-fledge alternative to evolution in IR. First, in biology itself, development was marginalized by the modern evolutionary synthesis. Second, the impoverished, reductionist view of development presented by the modern synthesis is not interesting analytically. And finally, alternatives to the modern synthesis, non-reductionist, holist, organicist views on development, when acknowledged at all, remain misunderstood and are often associated with stigmatized views, such as

teleological thinking and determinism, essentialism and substantialism, and even worse, fascism and vitalism.

The first reason why development has been ignored in IR is simply the remarkable success evolution has had in capturing and monopolizing social scientists’ conception of what biological theory has to offer. The success of the modern evolutionary synthesis has enabled its wide diffusion outside of biology and contributed to the marginalization of development as an alternative perspective on change.

The modern evolutionary synthesis that merged Darwin’s theory of evolution with Mendel’s theory of genetics was extremely successful both inside and outside biology. By breaking down complex biological systems into populations of discrete and countable units, the modern synthesis was a triumph for Darwinism, which had until that point relied heavily on interpretation and historical narrative. The modern synthesis allowed the mathematization of evolutionary biology.785 This success, however, was purchased at the cost of losing some of Darwin’s most important insights. Reductionism and population thinking effectively precluded a complex take on the role of developmental processes within evolution, which were comparatively difficult to analyze until recent advances in computing power have made modeling these complex dynamics increasingly possible. Developmental biology and embryology, and their emphasis on the organism and developmental processes, were thus completely

785 Depew and Weber 2011.
left out of the 1930s synthesis. And as social scientists began to take a renewed interest in evolutionary biology, little note was made of the marginalization of the whole-organism and of development.\textsuperscript{786}

The second reason for the neglect of development by the social sciences is that the reconstruction of development in the modern synthesis, which came to dominate popular imagination about what a developmental perspective has to offer, yields a deterministic image of the process that holds very little analytical appeal for social scientists. In the neo-Darwinian view, successive developmental ‘stages’ in the lives of individual organisms are simply viewed as the unfolding of the individual’s potential, that is, as the straightforward realization of a genetic blueprint coded in its DNA.

Social scientists can be excused for ignoring this image of development, which admittedly does not offer very interesting insights for them. Indeed, if the whole course of development is determined by the genotype, which is fixed before birth, it follows that we are better served by a focus on the evolutionary process through which new genotypes emerge and spread. This is, however, a very misleading picture of development, which modern developmental biologists model as a complex, contingent two-way interaction between the organism and its environment.

A good illustration of how social scientists have misunderstood development is offered by Richard Nelson’s influential take on evolution, which a number of IR

\textsuperscript{786} Ibid.
scholar have borrowed from, including Wendt in *Social Theory*.\(^7\) To his credit, Nelson is one of the few social scientists to explicitly acknowledge development as a distinct perspective on change. Nonetheless, how he frames evolution and development reflects the distorted and impoverished picture of development that emerged from the modern synthesis. As the following passage illustrates quite well, Nelson associates development with deterministic explanation by narrowing the meaning of development to the realization of a blueprint:

“In biology the use of the term evolutionary nowadays is firmly associated with analysis of actual populations of things. An embryo, or more generally a living creature, usually is described as developing, not evolving. In part this use of language reflects a predilection discussed earlier – that change ‘according to a plan’ is usually not regarded as evolutionary. However, it is recognized widely that many random occurrences will affect the development of an embryo or a tree. The prejudice against using the term ‘evolutionary’ to describe such biological processes stems from the fact that the term has been preempted for use in describing another class of biological phenomena.”\(^8\)

A few aspects of this passage are worth mentioning. First, Nelson is narrowing the meaning of development to mean the *deterministic* realization of a blueprint, regardless of variations in environments. Instead of seeing development as the complex, contingent interaction between organism and environment in the course of the organism’s lifecycle, his reaction to the fact that development actually comports a stochastic elements is to decide *by fiat* that the term ‘evolutionary’ should apply to these processes. Nelson’s argument can be summarized as follows:

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\(^7\) Wendt 1999: 319.
\(^8\) Nelson 1995: 55-56.
The transformation of single individuals over the course of their lifecycle is commonly referred to as development.

Development is deterministic.

Evolution is stochastic.

There is a stochastic element in the transformation of individuals.

Therefore, what we commonly call development is actually evolution.

What is going on here? Nelson clearly realizes that in many cases, we are interested in change in individuals, and not only population. So he would like his preferred framework, evolution, to apply to change in individuals as well as change in populations. In biology, however, there is a well-developed body of theory dealing with change in individuals, namely, developmental biology. Clearly, he does not want to engage development more deeply because he believes it is nothing more than the deterministic realization of a blueprint. Indeed, notice how he suggests that the existence of random occurrences that can affect development makes the theory ‘evolutionary.’ Evolution, however, does not have a monopoly on stochastic processes. The distinction between evolution and development is not between probabilism and determinism, but between change in populations and change in individuals. If some developmental theories have been deterministic, this is not at all representative of most modern treatments.

As I already pointed out, development is not essentially deterministic, but probabilistic, as should be expected of an approach that takes the complexity of the relationship between the organism and its environment so seriously. As Richard Lewontin, a prominent biological theorist whose work straddles evolution and development, puts it:
“There exists, and has existed for a long time, a large body of evidence that demonstrates that the ontogeny of an organism is the consequence of a unique interaction between the genes it carries, the temporal sequence of external environments through which it passes during its life, and random events of molecular interactions within individual cells.”789

A third reason for the neglect of development is that, unlike evolution, which is generally perceived as compatible with a number of modern assumptions about what constitutes good science, development is generally seen as being in disreputable intellectual company. I have already discussed how evolution is compatible with the dominant ontology of the international system as the population and social/strategic environment of states. The opposite is true of development. If evolution is generally seen as compatible with individualism and probabilism, development is a holist perspective that is often unfairly seen as determinist and essentialist.

On the one hand, development is often misconstrued as being deterministic, when in fact, it is probabilistic. Development is the product of a complex, two-way interaction between the organism and its environment that defies exact prediction, if only because there is always a degree of noise in development. While I have suggested that development can speak about the future, it does not do so in deterministic fashion. Indeed, concepts like norms of reaction and structural plasticity tell us certain things about the range of normal transformations we can expect from a given developing organism. But ultimately, as Depew and Weber succinctly put it, “dynamical models tell you, at best, what

Another misconception about development is that it privileges a substantialist perspective on the world. Iver Neumann’s critique of Wendt’s use of whole-organism concepts to talk about the state illustrates this misunderstanding. Neumann castigates the use of organism metaphors in IR for their putative essentialism. With organicism, Neumann argues, “either stuff must belong to organisms and be internal, or it must be external. This way of thinking privileges not relations but entities.” While he is right that the organism metaphor leads us to focus on the organism’s boundary with its environment and on the constitution of inside and outside, this does not mean that this boundary is essentialized, quite the contrary. In the theory of self-producing systems that I have introduced in chapter 3 and in the modern conception of development, the boundaries that individuate the organism vis-à-vis its environment are the product of a complex and recursive interaction of the organism’s metabolic and immune processes with the processes in its environment. The organism itself is understood as a network of self-production seeking to achieve closure through the production of a boundary. The boundaries of the organism are an achievement that is always at risk of unravelling under the pressures of adverse processes such as thermodynamic decay.

Developmental biology, thus, is deeply processual, not substantialist, and taking process seriously is actually another good reason to borrow from biological theory’s understanding of systems rather than from Newtonian systems, as we have traditionally done (remember the image of colliding billiard balls?). Unlike the Newtonian systems we have been familiar with, which are about the interaction of preexisting entities, biological systems are always engaged in the process of constructing themselves and their environments in the face of the forces of thermodynamic decay. Indeed, as Depew and Weber put it, “it is by cycling matter, energy, and information that (organisms) grow, differentiate, and, having reached the limit of their ability to buffer themselves against contingencies, fall apart... On this view, organisms are, ontologically, processes rather than things or a fortiori artifactual things.”

These common misconceptions about development are unfounded. Modern developmental system theory offers a dynamic, processual take on system-environment. Not only does this account of development, which is much richer than the reductionist view, address many problems that fall in the blind side of evolution, but it also offers a complex systems foundation for a processual take on the constitution of the state and the international system and thus, a solution to Lars-Erik Cederman and Christopher Daase’s challenge that we develop an endogenous account of the corporate identity of the state.

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792 Jackson and Nexon 1999.
793 Depew and Weber 2011: 100.
794 Cederman and Daase 2003.
In the next section, I illustrate the value added of taking a developmental perspective on the transformation of a self-producing system with an example from the philosophy of science. I contrast Popper’s evolutionary perspective on progress with Lakatos’ developmental perspective on progress. My goals in using this illustration are two-fold. First, I want to demonstrate the wider applicability of developmental thinking beyond the case of the international system and the biological cases that I have used to illustrate development. Second, the discussion will give me additional vocabulary to describe the latest transformation of sovereignty in R2P.

**Illustration: contrasting Popper’s evolutionary and Lakatos’ developmental epistemologies**

In this section, I illustrate the developmental perspective with the help of a concrete example of autopoietic systems: Lakatos’ Methodology of Scientific Research Programs (MSRP). Beyond their role in illustrating autopoiesis, introducing Lakatos’ concepts of positive and negative heuristics will be useful in my discussion of sovereignty’s transformative potential.

Because it is familiar to many students of IR, Lakatos’ MSRP provides a useful illustration of the dynamics of developing, self-producing systems. Although it has, to my knowledge, never been described in those terms, Lakatos offers a

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795 Lakatos 1970.

796 For a discussion of Lakatos’ MSRP in the context of an evaluation of progress in IR, see Elman and Elman 2003.
developmental account of scientific progress that takes scientific organization,
embodied in the scientific research program, as the unit of scientific change,
development and progress. As such, MSRP can be understood as analogous to
whole-organism, developmental biology. In this vignette, I recapitulate the
building blocks of Lakatos’ MSRP and discuss how scientific research programs
exhibit developmental dynamics.

Lakatos’ MSRP was intended as a constructive critique of Popper’s
‘falsificationism.’\textsuperscript{797} Interestingly, Popper’s views had themselves been inspired
by Darwinian thought.\textsuperscript{798} Popper thus conceptualized scientific progress as
consisting of a ‘struggle for survival’ within the ‘population’ of competing,
individual scientific hypotheses. Consistent with his Darwinian views, he
emphasized the importance of environmental selection in scientific progress:
‘bold conjectures’ (plentiful variation) and ‘ruthless falsification’ (intense
selection pressures) should guide scientific practice. Progress, Popper argued,
hinged on scientists’ willingness to select falsified, ‘unfit’ hypotheses out.

Consistent with Darwinian evolution, however, Popper was not so much
interested in the emergence of variation (the process through which hypotheses
are formed), but was rather more interested in the selection process (how they
are falsified). Indeed, Popper advocated a sharp delineation between the ‘context

\textsuperscript{797} Popper 2014.
\textsuperscript{798} Popper and Lakatos are often interpreted as having both borrowed from evolutionary thinking.
As my discussion will make clear, there are fundamental differences between them, and
distinguishing Popper’s evolutionary perspective and Lakatos’ developmental perspective makes
these differences apparent. Again, I think the indiscriminate labeling of both thinkers as
evolutionary reflects the fact that the developmental perspective is not well understood outside
biology. See Marcus Holmes’ (2011) discussion for instance.
of discovery’ and the ‘context of justification’: he believed that the process of hypothesis formation was ultimately irrational and argued that its study belonged to psychology; only the context of justification was the proper domain of the philosophy of science. Like evolution, thus, Popper expected (scientific) change to be gradual and to reflect environmental selection (empirical refutation); new hypotheses would randomly emerge, and gradually, through rigorous testing, good ones would survive and bad ones die out. As in Darwinism, Popper understood reality as constructing niches that good scientific theories would fill out over time, if only of course the scientific community was willing to make falsifiable claims and to subject them to hard tests.

Lakatos offered what could be termed a developmental critique of Popper’s Darwinian view. Popper, Lakatos argued, failed to take into account the professional organization of science, the vested interest scientists have in their theories, and thus, how reluctant scientists actually are to eliminate theories in the face of apparent falsifications. These oversights led Popper to overstate the importance of falsifications in producing scientific change. Actual scientists do not behave in the way described by Popper. When confronted with anomalies, Lakatos argued, echoing Kuhn, scientists initially look for ways to salvage their

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799 The reader might wonder where Kuhn’s account of normal science and scientific revolutions would fit in this illustration. My view is that Kuhn’s theory of progress is closer to the punctuated equilibrium view of evolution. There are significant developmental insights in Kuhn’s account of normal science, but like punctuated equilibrium theorists, he does not seek to explicate the actual mechanisms at work, and rather focuses on ‘covering’ the broader historical pattern. The transition from crisis to revolution, in Kuhn, is explained by crowd psychology, not as a rational process. Lakatos on the other hand provides a ‘rational’ account of normal science, crisis, and revolution.
theories. They initially resist falsification. This is because they have deeply internalized these theories, which are necessary for them to define and solve problems. They also have a vested professional interest in these theories, in which they have invested their time, resources and reputation. In practice, thus, scientists generally deal with anomalies by formulating scope conditions and auxiliary hypotheses so as to incorporate recalcitrant facts back into the fold. Dealing with anomalies is not limited to struggling research programs; it is actually inevitable and represents a normal part of science. Scientific theories, Lakatos argued, are always simplifications of a more complex reality (theories are always *ceteris paribus*), and are thus bound to generate anomalies. The fit between the world that a theory creates and reality is never a perfect match. As such, scientific theories should not be judged on their ability to withstand single tests, but rather, should be evaluated on their ability to generate adaptations in response to the various anomalies they inevitably encounter.

Unlike Popper, who viewed the emergence of new hypotheses as irrational (or random), Lakatos’ MSRP describes the logic of this conservative practice. In this model of scientific practice, scientific research programs replace the population of hypotheses as the unit of scientific change, development and progress. Lakatos conceptualizes research programs developmentally: as series of models of increasing complexity guided by a set of guidelines defining how new models are to be added to its core model. These series of models are akin to the ‘norm of reaction’ of an organism: the research program anticipates organization-

\footnote{Kuhn 1962.}
consistent changes in its structure in response to environmental challenges that its organization and structure at any given time create for itself. Scientific research programs are fundamentally conservative in their development: each new model along the series represents an attempt by the program to defeat falsifications by assimilating complexity without jeopardizing its theoretical coherence.

Research programs are organized systems that are constituted by a ‘hard core’, a ‘protective belt’ and a ‘negative’ and ‘positive heuristic.’ The hard core of the program is the set of fundamental assumptions that defines the identity of the program and guides its development. The protective belt of the program is made up of auxiliary hypotheses that serve to defend the hard core from refutations. Each modification to the protective belt constitutes a ‘new’ model of increasing complexity. The negative heuristic of the program forbids changes in the hard core by specifying that auxiliary hypotheses must always be consistent with the core assumptions of the program, and thus, constitutes the ‘conservative bias’ of the research program. The positive heuristic, on the other hand, prescribes how changes in the protective belt should be carried out; it represents the ‘programmatic’ part of the research program.

Translated in the language of self-producing, developmental systems, then, the hard core constitutes the ‘organization’ of the research program and the protective belt constitutes its ‘structure.’ Together, the negative and positive heuristics define the ‘plasticity’ (or norm of reaction) of the research program’s
protective belt (structure), that is, the kind of changes the protective belt can undergo without undermining the hard core (organization). The cognitive environment of the research program consists in the world as the research program models it: the entities, processes, relations that its models posit. The external environment is complex and consists of the phenomena left unmodeled by the research program. The ceteris paribus clause of any model is what effectively closes the system’s cognitive environment from its external environment.

The dynamics of scientific research programs illustrate the developmental dynamics of self-producing systems. Research programs are said to be ‘progressive’ when the protective belt grows in such a way that it enables the production of novel facts (it enables the program to explain more than the anomalies that motivated the new model), without violating the negative and positive heuristic. Another way to put this is that the production of novel facts enables the research program to control its environment better.

Hence, the purpose of the research program, like that of an organism, is to continue self-production via the production of novel fact-producing auxiliary hypotheses that enable it to continue to produce further auxiliary hypotheses in the future, that is, to continue developing along the series of problems/models foreseen by previous models in the series. With each step in the development of a research program, however, new anomalies emerge and new problems (or puzzles) are created. A research program will be ‘progressive’ or ‘degenerative’ in
its development depending on whether there is a net increase in the program’s ability to tackle problems or whether new solutions only generate more problems.

‘Degenerative’ programs produce ‘ad hoc’ changes to their protective belt that undermine their ability to increase their complexity in a manner that is consistent with their core. ‘Ad hoc’ changes are auxiliary hypotheses that violate the negative and/or positive heuristic(s) of the program, and as a result, that merely serve to patch up anomalies, without increasing the program’s ability to model complex reality. Unlike ‘progressive’ changes, ‘ad hoc’ changes undermine self-production in the sense that they do not open possibilities for further theorizing; being inconsistent with the program’s core, they cannot constitute a platform for further, more complex models. ‘Ad hoc’ modifications, thus, stop the development of a research program dead in its tracks.

In sum, while the evolutionary perspective locates the mechanisms of change primarily in the environment, the developmental perspective locates the mechanisms of change in the autopoietic organization of the organism itself. As my discussion of the autopoietic character of Lakatosian scientific research programs illustrated, autopoietic systems subordinate adaptations to their environment to the goal of preserving their (autopoietic) organization and the extent to which they can transform themselves without undermining their organization depends on the plasticity of their structure.
The development of the international system

To begin thinking developmentally about the contemporary international system, we have to go back to the physiological perspective I introduced in chapter 3, and to my argument in chapter 4 that the contemporary international system is a self-producing system and that its self-producing organization is realized via exclusive international sovereignty practices which constitute it as a closed network of self-production.

Three developmental principles should structure our thinking about the development of the international system: organizational closure, structural determinism, and the mutual construction of system and environment in developmental cycles. First, normal development is conservative (organizational closure): it serves the primary function of maintaining the self-producing organization of the system. In the case of the international system, this means, again building on the discussion in chapter 4, that changes to the institution of sovereignty must help preserve states’ shared monopoly over metapolitical authority.

Second, any new development is determined by the structure of the system at that moment (structural determinism). Developmental mechanisms keep the changes individual organisms experience during their lives within certain bounds, which makes it possible to speak of ‘normal’ versus ‘abnormal’ developmental processes, in contrast with evolution where we cannot speak meaningfully of ‘normal evolution’. Environmental selection, then, can only select
from the choices made available by the system’s structure at any given point. If the structure is unable to supply autopoiesis-maintaining adaptations to an environmental challenge, that is, if the structure is too rigid for its environment, self-production will break down and the system could die. Systems with a plastic structure, however, can undergo dramatic transformations and still retain their organization, and thus, their identity over time.

Third, development is the product of the complex mutual construction of system and environment in development cycles. This is another key difference between development and evolution. In evolution, the environment is an exogenous force that is the primary cause of transformation. Unlike evolution, development captures the role of the organism in the construction of its environment. The key concept when examining the complex relationship between the organism and the environment is the development cycle. The concept of development cycle captures the idea that organisms transform themselves to solve environmental problems, but that in the process, they also transform their environment and generate new problems for themselves. The lifecycle can thus be broken down into several development cycles. Figure 6.1 illustrates a typical developmental cycle:
As will have become obvious, development is a ‘path dependent’ process. “Path dependence,” as James Mahoney defines it, “characterizes specifically those
historical sequences in which contingent events set into motion institutional patterns or event chains that have deterministic properties.”\textsuperscript{801} Mahoney distinguishes between two types of path dependent processes: self-reinforcing path dependencies and reactive sequences. The developmental process exhibits elements of both types. In self-reinforcing path dependencies, “initial steps in a particular direction induce further movements in the same direction such that over time it becomes difficult or impossible to reverse direction.”\textsuperscript{802} “Reactive sequences,” on the other hand, “are chains of temporally ordered and causally connected events” in which “each event in the sequence is both a reaction to antecedent events and a cause of subsequent events.”\textsuperscript{803}

Development, when normal, is self-reinforcing. This is the result of the self-production dynamics that underpin it. Changes to the structure of a system at a given time both generate new environmental problems the system will have to face and become the basis for further changes in the system (structural determinism). Development is also a ‘reactive sequence,’ at the level of the relationship between the system and its environment in successive developmental cycles. Changes to the structure of the system transform the system’s environment, thus generating new problems, some intended some not, which will necessitate further changes to the system’s structure in order to continue self-production.

\textsuperscript{801} Mahoney 2000: 507. 
\textsuperscript{802} Ibid: 512. 
\textsuperscript{803} Ibid: 526.
Mahoney suggests that an important characteristic of “path-dependent institutions” is that they “persist in the absence of the forces responsible for their original reproduction” and that “the causes of institutional reproduction are distinct from the processes that bring about the institution in the first place;”\textsuperscript{804} This is consistent with my argument that while METI theory can help us understand how the international system became an individual, we will need a complementary developmental account to understand its future transformations.

In sum, self-producing systems transform their structure and their environments in order to preserve their organization. Development is the process through which a self-producing system and its environment mutually construct each other over the course of the system’s lifecycle. The extent to which a self-producing system can transform its structure or transform its environment to adapt to an environmental challenge depends on the plasticity of its structure at any given time.

\textit{The case of the Responsibility to Protect}

How plastic is contemporary sovereignty? Given the conceptualization of sovereignty that I have offered in chapter 3, my answer to this question will depend on the range of reforms in the principles of differentiation of sovereignty that can be accommodated without undermining the reproduction of sovereignty’s fundamental organization, the closed network of self-production of states’ meta-political authority. To understand the development of the

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\textsuperscript{804} Ibid: 515.
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international system involves asking a number of questions about the potential for transformation in the system and the mutual construction effects between changing systems and environments. These questions capture the logic of the developmental cycle. The further we get in the sequence, however, the more difficult the exercise becomes.

1. What is the current structure of sovereignty?
2. What environmental problems does the current structure create?
3. How plastic is the current structure of sovereignty? In other words, what transformations in the principles of differentiation of sovereignty are possible, given the principles of organizational closure and structural determinism?
4. How does each potential transformation of sovereignty reproduce or undermine the closed network of self-production described in chapter 4?
5. For each potential future structural transformation, go through steps 1 to 4.

What is the current structure of international sovereignty? In chapter 4 I have outlined the historical trajectory the principles of differentiation of the international system have taken, from dynastic rights to the R2P. Initially states were differentiated according to dynastic rights which were, themselves, legitimated by the idea of the divine right of kings.\textsuperscript{805} Dynastic principles were challenged by the ideas of the French Revolution and two decades of almost continuous warfare. The French Revolution brought forth a new legitimation of sovereignty as residing in the people, and more specifically the nation. “To the Jacobins ‘the people’ has become ‘the nation,’ a mystical entity, an absolute

\textsuperscript{805} Bonney 1991.
The Declaration of the Rights of Man and Citizen, approved by the national assembly of France on August 26, 1789, thus affirmed that “the principle of all sovereignty resides essentially in the nation” and that “no body nor individual may exercise any authority which does not proceed directly from the nation.”

The principle of national sovereignty challenged dynastic rights to their core, but the ultimate defeat of Napoleon enabled the latter’s restoration, albeit in a modified form that took into account the growing popular legitimacy of the concept of nation. The restoration that occurred at the Congress of Vienna was a conservative adaptation of dynastic conception of sovereignty to the rise of national sentiment and passions. Monarchic principles thus replaced dynastic ones. While dynastic principles of legitimation had equated state and ruler, monarchism introduced a distinction between the two entities. The state came to be seen as distinct entity that stood independently from its ruler, and the presence of a monarch, which was not equated with the state anymore, came to be understood as a requirement for legitimate statehood. Legitimate states were to be monarchies. The French state was restored and the Bourbon dynasty recognized as its ruler. The new states created during that period, such as Belgium (1831) and Norway (1905), thus needed to find a recognized monarchy in order to achieve recognition by the international community.

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806 Hayes 1968: 69.
807 Declaration of the Rights of Man and Citizen 1789.
808 Barkin 1998.
809 Craig 1971.
19th century and up until the First World War, European monarchies thus reserved the right to intervene in states where the monarchy appeared to be threatened. As Metternich put it, under the new Concert, the Great Powers had “the right to intervene belongs as clearly and indisputably to every government which finds itself in danger of being drawn into the revolutionary maelstrom, as it does to any individual who must put out a fire in his neighbor's house if it is not to spread to its own.”

That system was destroyed by World War I, the US involvement in the war and the making of the peace, and the Russian Revolution of 1917. US President Woodrow Wilson, who played a determinant role in the peace settlement, viewed the mismatch between nations and states as one of the central causes of the war. Nationalist pressures inside the Austrian-Hungarian Empire and the antagonisms between German and Slavic nationalisms had indeed provided much of the gunpowder and the spark for the explosion, which rigid European alliance systems and multipolarity had then magnified. Under Wilson’s influence, the monarchical principles that had been attached to sovereignty at Vienna were replaced by the Rousseauian principles of the French Revolution, now understood as ‘national self-determination,’ whose concept of ‘general will’ offered a construct on which new legitimation of the state could be built. Under this principle, “a state is considered legitimate by the international community if

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811 Christensen and Snyder 1990.
it represents a given national group, and all members of that national group are a legitimate concern of the state.”

A number of problems emerged with self-determination, however. Legitimating sovereignty on the basis of the nation creates tensions with the territorial basis of sovereignty. Where do we assign sovereignty in cases where a nation spans multiple existing states, as was the case with German and Slav nations? How do we arbitrate in cases where two or more nations find themselves within the same existing territorial boundaries, as was the case in the Ottoman, Russian and Austrian-Hungarian empires? Which nations should be recognized? Which borders should be modified? All of these problems, of course, were compounded by the fact that the nation is a social construct, subject to (re)construction by nationalist entrepreneurs (e.g. pan-Germanism and Zionism), as well as a particularly potent source of social mobilization.

After a few decades, it became clear to everyone that national self-determination was deeply destabilizing and far from representing an ideal solution. The idea of national self-determination was one important enabling cause of World War II. National self-determination was used by Adolf Hitler to remilitarize the Rhineland, and annex Austria and the Sudetenland. When the Allies refused to recognize his annexation of the German-speaking areas of Poland, however, there was nowhere left to go but war. National sovereignty was an ill-fated reform that illustrates how changes in the structure of the international system, undertaken

to preserve its organization in the face of a challenge, can change the environment of the international system in ways that generate new and sometimes more important problems and challenges.

In the post-War settlement, the territorial status quo became the legitimating principle of sovereignty and the norm of self-determination of peoples was reformed. While self-determination was initially tied to the Rousseauian concept of nation, following WWII it was dissociated from the nation and tied to the concept of individual. The concept of ‘people’ came to be understood not as the nation but as the citizens living in a given territory. Meanwhile, an emerging notion of individual human rights emerged, but initially remained uncoupled to sovereignty. World War II had demonstrated the volatility of the nation as the source of sovereignty and the atrocities committed by European states had completely discredited the Standard of Civilization as the moral foundation of sovereignty. The particular mix of sovereignty norms that was established after WWII reflected the need to find a new basis for sovereignty that was less volatile than the nation as well as the necessity to find a moral justification for sovereignty that did not connote European paternalism and assumed moral superiority, which was thoroughly discredited by the atrocities Europeans had committed during WWII. Territorial sovereignty and universal human rights thus became the two pillars of the United Nations System.\footnote{Glanville 2010; Fidler 2001.}

\footnotetext[813]{Glanville 2010; Fidler 2001.}
The territorial sovereignty norm is based on the “reification of defined territories.”814 Existing territorial boundaries and the principle of non-interference were emphasized over the rights of nations. During the post-WWII wave of decolonization, the new states therefore typically inherited existing colonial boundaries. Universal human rights, adopted in the Universal Declaration on Human Rights, and inscribed in Articles 55 and 56 of the Charter of the United Nations and in the two International Covenants on Human Rights, provided a potent motivation and legitimation for decolonization.815 In the decades that followed, state sovereignty was thus justified by a mix of popular sovereignty and territorial sovereignty notions. Once again, however, this was an imperfect solution that led to important tensions in many cases, as the application of human rights criteria increasingly challenged the strict application of territorial sovereignty, leading to countless debates over humanitarian intervention, especially after the fall of the Soviet Union.816

Many observers have described the emergence of human rights discourse, and the cosmopolitan project as a whole, as a challenge to the organizational logic of the international system.817 “Sovereignty and human rights are,” as Christian Reus-Smit puts it, “considered two separate regimes, that stand in a zero-sum relationship – the stronger the principle of sovereignty, the weaker norms of

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814 Barkin 1998: 244.
815 Reus-Smit 2001: 531.
817 Lyons and Mastanduno 1995.
human rights, and vice versa.” Barkin sees “a clear tension between human rights, defined as the rights of individuals primarily as against the state, and sovereignty, defined as the right of the state to do as it sees fit within its jurisdictional domain.” Sikkink thus argues that “the doctrine of internationally protected human rights offers one of the most powerful critiques of sovereignty as currently constituted.” “Human rights,” Jackson concurs, “are intended to curb sovereign rights.”

How plastic is sovereignty at the beginning of the 21st century? Historically sovereignty appears to have had a remarkably plastic structure. Some authors have highlighted sovereignty’s conservative bias. Daniel Philpott suggested that “in the history of sovereignty one can skip three hundred years without omitting noteworthy change.” At the level of sovereignty’s organization, Philpott is right. However, at the level of the structure of sovereignty (principles of differentiation), there have been many important changes in the last 300 years.

These changes, however, have been characterized by their conservative bias. Despite tremendous social, economic, political and normative changes in the sovereign state system’s ‘environment,’ the basic autopoietic organization of sovereignty has remained essentially the same since its inception. As Jackson remarks, “sovereignty is like Lego: it is a relatively simple idea but you can build

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821 Jackson 1993: 23.
822 Philpott 1996: 43.
almost anything with it, large or small, as long as you follow the rules.”\textsuperscript{824} This is largely due, according to my autopoietic theory, to successive reforms, carried in and through international practices, in sovereignty’s structure, which I have interpreted through the concept of differentiation.

At the beginning of the new millennium, a new sovereignty principle, the R2P rose to prominence and was quickly adopted by the international community. The R2P was a response to the tensions between territorial sovereignty (and its corresponding norm of non-interference) and the growing human rights regime. The idea of the R2P is that if a state is responsible for safeguarding the rights of its people. Should a state fail in its responsibilities towards its people, the international community becomes responsible for the safeguard of that people’s rights and can legitimately intervene on that people’s behalf. The new principle was first expressed in the International Commission on Intervention and State Sovereignty (2001), and was more precisely defined and universally endorsed at the UN World Summit (September 2005).

The R2P is defined in paragraphs 138 and 139 of the UN World Summit Outcome Document. Paragraph 138 states that:

“Each individual State has the responsibility to protect its populations from genocide, war crimes, ethnic cleansing and crimes against humanity. This responsibility entails the prevention of such crimes, including their incitement, through appropriate and necessary means. We accept that responsibility and will act in accordance with it. The international community should, as

\textsuperscript{824} Jackson 1999: 431.
appropriate, encourage and help States to exercise this responsibility and support the United Nations in establishing an early warning capability.”

Paragraph 139 affirms that:

“The international community, through the United Nations, also has the responsibility to use appropriate diplomatic, humanitarian and other peaceful means, in accordance with Chapters VI and VIII of the Charter, to help protect populations from genocide, war crimes, ethnic cleansing and crimes against humanity. In this context, we are prepared to take collective action, in a timely and decisive manner, through the Security Council, in accordance with the Charter, including Chapter VII, on a case-by-case basis and in cooperation with relevant regional organizations as appropriate, should peaceful means be inadequate and national authorities manifestly fail to protect their populations from genocide, war crimes, ethnic cleansing and crimes against humanity. We stress the need for the General Assembly to continue consideration of the responsibility to protect populations from genocide, war crimes, ethnic cleansing and crimes against humanity and its implications, bearing in mind the principles of the Charter and international law. We also intend to commit ourselves, as necessary and appropriate, to helping States build capacity to protect their populations from genocide, war crimes, ethnic cleansing and crimes against humanity and to assisting those which are under stress before crises and conflicts break out.”

Is the R2P progressive or degenerative? This question can only be answered post-hoc, because the external environment, which this latest reform will undoubtedly partly ‘construct’, ultimately plays a role in determining the ‘objective’ conditions of success of a given reform. However, a developmental approach enjoins us to think about a case of reform in terms of its consistency with the organizing principles of sovereignty. Doing so can give us an idea about the transformative

potential of sovereignty. We can thus ask whether a reform such as the R2P is potentially progressive or degenerative, from the vantage point of the international system.

The R2P illustrates the purchase of taking a developmental perspective on international sovereignty’s transformation. What does the R2P mean for the development of the international system? Recalling that self-producing systems metabolically convert the resources from their environment into more of themselves and that sovereignty is about the production of meta-political authority by the international system, how does the contemporary international system use its environment in the reproduction of sovereignty? The international system produces and is produced by legitimacy and authority. Wight’s definition of legitimacy as “the collective judgment of international society about rightful membership of the family of nations” is one dimension of this legitimacy.827 It is a horizontal dimension; it captures how states relate to each other. It is important to remember that meta-political authority is necessarily purchased on the backs of individual human beings. In other words, human individuals have to acquiesce to this organization, via its institutional manifestations at more local levels. The vertical dimension, however, is about how states use resources from their environment to reproduce sovereignty. There we have to look at the interaction of the sovereign state system with ideas in the system’s environment. Nationalism is one idea, and I have described the cycle through which that idea led to

adjustments in sovereignty and generated new problems. Human rights are another set of ideas that are currently in the process of changing the system.

The R2P has been hailed by its proponents as moving beyond sovereignty and as a victory for the Cosmopolitan project. If we take an evolutionary perspective on normative change and look at the new norm strictly from the perspective of the “environment” of the state system, that is, by examining its emergence against the background of a growing concern over the humanitarian rights of individuals and the cosmopolitan project, and frustration over the failures of the international community to intervene in egregious cases of human rights abuse such as the Rwandan genocide, it is easy to see the R2P as undermining state sovereignty. Taking this perspective immediately draws our eyes to Paragraph 138 of the Outcome Document of the UN’s 2005 World Summit, which states how the new norm places an emphasis on human security and makes state sovereignty conditional on the state's respect for human rights. It seems as if sovereignty, and more specifically the territorial principle and non-intervention, is being undermined by human rights concerns.

However, the R2P also provides a legitimation for the state system in an era where individuals have become extremely important politically. Looking at the new norm from the perspective of the self-producing organization of the international system and the requirement that metapolitical authority remain in the hands of states, however, draws our attention to Paragraph 139, which clearly locates the authority over the norm in the hands of the UN Security Council. The
R2P does not undermine the sovereign authority of states because states, and more specifically the Great Powers on the UN Security Council, retain sovereignty over R2P decisions. Recall how the essential aspect of sovereignty from the vantage point of self-production of metapolitical authority is the Schmittian “authority to decide the exception.”

As some observers have discerned, the R2P simply constitutes a new set of responsibilities that come with sovereign recognition. Sovereign recognition has always been conditional. “This conceptualization of sovereign responsibilities suggests that, while people have a right to govern themselves free from outside interference, this should be conditional on their protection of human rights; the legitimate expression of the will of a sovereign people entails the protection of their individual rights.” The idea that sovereignty comports responsibilities and a corresponding right to intervene on the part of other recognized sovereign is not completely novel. Indeed, as Luke Glanville notes, it can be found in the earliest texts on sovereignty, such as the writings of the jurists Jean Bodin and Hugo Grotius, who are respectively seen as the founder of the idea of sovereignty and the father of international law. Indeed, Bodin “defined that subjects had a right to resist despotic rulers, but granted sovereign princes a right ‘to take up arms in defence of a whole people unjustly oppressed by a cruel tyrant’” and Grotius “refused to allow that oppressed subjects could ‘redress grievances by force of arms’ but ... insisted that ‘it does not necessarily follow that other powers

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828 See discussion in chapter 3.
829 Reus-Smit 2001; Glanville 2011.
830 Glanville 2011: 249.
are prohibited from giving them assistance when laboring under grievous oppressions." 831 Reus-Smit concurs that “the organizing principle of sovereignty has never been a self-referential value; it has always been justified with reference to particular conceptions of legitimate statehood and rightful state action.” 832

There is remarkable continuity from the 19th century Standard of Civilization to contemporary human rights and the R2P. The Standard of Civilization was a responsibility criterion for much of the 19th and early 20th century and was applied to determine membership. 833 It also justified the trusteeship and mandate systems. Donnelly argues that “human rights represent a progressive late twentieth century expression of the important idea that international legitimacy and full membership in international society must rest in part on standards of just, humane or civilized behavior.” 834

Reus-Smith, Donnelly and Glanville, however, do not go far enough in their description of the relationship between human rights and sovereignty. What remains to be said is R2P can be seen as a conservative reform in the ‘mode of differentiation’ of sovereignty that does not undermine the system’s organization, that is, the exclusionary character recognition practices, as the latter continue to decide, arbitrate and enforce, and thus retain ultimate competence and authority over the norm. Indeed, the R2P empowers the UN Security Council with the

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831 Cited in Ibid: 240.
832 Reus-Smith 2001: 520.
833 Gong 1984.
authority (the competence) to interpret and decide the norm and the modalities of its enforcement.

To the extent that a norm like the R2P diminish the pressures from the cosmopolitan project on the state-based order, it can indeed be seen as a modification in the structure of international sovereignty that is consistent with the organization of self-production. The R2P can thus be considered potentially progressive for sovereignty. Given that the external environment of the system has the ‘last word’ on any modification in the system’s structure, we will have to wait to determine whether the reform is actually progressive or not. Because it helps preserve states shared monopoly on metapolitical authority, however, the R2P contributes to maintain the enhanced control over its environment the METI has made possible.

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835 Lakatos 1970.
Conclusion

The international system is arguably the most central object in the ontology of IR; it permeates our thinking about international politics and plays a foundational and legitimating role for the IR discipline, carving out an autonomous sphere, the international, requiring specialized knowledge. Today, at a time when the international system appears to be in the midst of a complex and puzzling mix of globalizing changes and fundamental continuities in its organization, grasping the transformative potential of the international system has acquired urgency. The contemporary era is characterized by a maelstrom of transformations in the military, economic, normative and physical environment of the international system that are widely believed to constitute fundamental challenges to the basic functions of the state. These transformations are occurring at faster pace than previous large-scale transformations, such as the rise of long-distance trade and the industrial revolution, and they are occurring on a global scale. In addition, a number of scholars have noted a corresponding crisis in state authority as evidence that the state is being displaced as the dominant unit of global politics.
In the meantime, however, across a range of key indicators, the international system appears to be thriving; it has not only persisted in its fundamental organization, but expanded its scope to the point it is now universal. It has also become further entrenched in many ways, notably the unprecedented fixity of its borders. What is more, many of the purported globalization challenges are actually being pushed forward by states, who have not only been enablers but also promoters of these transformations.

Two questions have guided this inquiry into the international system. What is the international system? How does it change? In IR, the dominant way to think about the nature and transformation of the international system has been through the anarchy problematic. Across paradigmatic divides, IR scholars have assumed that the international system is most fundamentally a competitive anarchy and worked from that premise. While there is much disagreement about the consequences of anarchy for international life, and whether anarchy can be altered or transcended, most have agreed on anarchy as a starting point. Notable exceptions are post-structuralists, like Ashley, Walker, Bartelson, and others, who have critiqued the perverse consequences of the reification of international anarchy and the need to study the conditions of possibility of international anarchy.836 Their critique, however, has not amounted to a positive program that can help us think about the international system in the globalization era. Despite its key importance, interest in the study of the international system, which had peaked in the years preceding and following the end of the Cold War, has

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dwindled in recent years. As a result, even if IR scholars do not spend much time thinking about the system these days, most continue to work under the assumption that it is, down to its core, a competitive anarchy.

Recap

In this dissertation, I have critiqued the Darwinian perspective on the international system, which underlies and legitimates the ubiquitous belief that the international system is essentially a competitive anarchy. Our conception of the international system and its transformation are permeated with Darwinian images; IR scholars generally assume that the international system is the population of states that, through inter-state interactions, simultaneously constitutes these states’ primary security environment. Like a Darwinian system, the international system is assumed to be essentially individualistic and competitive. When thinking about international system transformation, thus, IR scholars have overwhelmingly relied on rough Darwinian models in which environmental changes, mediated by inter-state competition, drive transformations in the population of states.

This Darwinian perspective, I have argued, has not only legitimated Realism’s pessimistic take on the international system, but also constituted an obstacle to a better understanding of contemporary transformations in the international system in the globalization era. Indeed, if we believe that the international system

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837 See Albert, Cederman and Wendt 2010.
is fundamentally governed by Darwinian dynamics, the recent international political trends indicating that international relations have become exceptionally peaceful, cooperative, integrated, and organized, cannot be interpreted as constituting a fundamental transformation in the structure of world politics. Instead, any steps towards more peaceful and cooperative international relations will be interpreted as temporary and fragile, waiting to be unraveled by the next environmental shift. In addition, I have argued, the Darwinian perspective offers only limited insights into the contemporary status and future of the international system in the face of globalization challenges. Because a Darwinian perspective assigns causal primacy to the environment and exogenizes the environment, it assumes that strong environmental changes should yield corresponding transformations in the system. Yet, the explanatory challenge today also consists in making sense of the puzzling continuities in the international system despite globalization and of the apparent endogeneity in the international system–globalization relationship.

Unlike existing post-structuralist critiques, I have not drawn my critical tools and resources from social theory and the humanities, but from contemporary biological theory. I have proposed a problematizing redescription of the international system from three complementary, modern biological perspectives – evolution, physiology, and development – that, together, thoroughly challenge

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838 See Thayer’s (2013: 408) take on the likelihood that the decline in human violence is stable: “all actors—governments, civil society, religious authorities, popular culture—must guard against backsliding and be sensitive to the fact that even if violence declines in the West, our evolutionary legacy ensures that the inner demons never go away.”
the way we are accustomed to think about the international system, enabling us to think about key contemporary transformations in the international system that a Darwinian perspective obscures, and offering us a way to think about the international system’s future. This is a move that may appear rather strange, since biological thinking about social systems is widely seen among post-structuralists as one of the most pernicious forms of reification of the social. Yet against this belief, I have argued that the best and latest biological theories are actually very consistent with post-structuralism’s iconoclastic purpose, since they also rest on a fundamentally processual worldview. Contemporary biological theory recognizes that the world of the living is made up of processes and views living entities as perpetually engaged in constructing themselves.

Theoretical claims

The bulk of my critique has been of a theoretical nature. In chapter 2, I have challenged the Darwinian assumptions underpinning IR theory from two angles. First, I have challenged the underlying assumptions about the nature of real individuality that underpin much of IR theory, and the anarchy problematic particularly. One reason we have struggled to transcend international anarchy, I have argued, is that we cannot imagine individuality above the state. For a mix of folk biological and experiential reasons, we generally believe that only human beings can be real individuals or in other words, real agents. In practice, however, we assume that states are individuals, but only in an as if sense, because we (most of the time implicitly) assume that states are organized like individual
human beings (although this is contested). In any case, our model of individuality remains the human person. In chapter 2, I have challenged this idea by showing how biologists increasingly recognize how biological individuality comes in unusual shapes and forms. I have shown that it is even believed to exist at the level of heterogenous collectivities like aspen groves, coral reefs, and insect colonies. I have also shown that human beings are not individuals in the sense we hold them to be, they are actually collectives made up by a variety of bacteria that significantly outnumber genuinely human cells nine to one. If a termite colony can be an individual, why not the international system? And if the human person is not really a unitary ‘actor,’ then why take it as our criterion of individuality? From a modern biological perspective, I have argued, there are no a priori reasons why the international system could not be an individual agent.

Modern biology does not only suggest we can think about an entity like the international system as an individual, but one of its theories also suggests that the international system is actually becoming an individual. Indeed, drawing from the theory of Major Evolutionary Transitions to Individuality (METIs), a modern evolutionary perspective that is behind the revolution in biologists’ thinking about individuality and that seeks to account for the emergence of biological individuals through Darwinian mechanisms, I have argued that the international system is in the midst of a transition to individuality. Using METI theory, I have explained how the pacification of inter-state relations (the decline of inter-state war and the complete disappearance of Great Power wars), the growing cooperation, integration, and organization of international relations, the
displacement of collective security threats from states to non-state sources, and
the emergence of net benefits to statehood, constitute, together, a METI, which
has led me to conclude that the international structure is becoming an agent.

In chapters 3 and 4, I have pushed this argument further. If the international
system is becoming an individual, then what kind of individual is it becoming? I
have approached this question, once again, from a biological perspective. Assuming that the emerging international system individual is a superorganism,
a collective entity that exhibits the functional organization of single organisms
and that is itself the object of selection pressures, I have suggested that we should
begin addressing this question by investigating the functional organization of the
superorganism. To do so I have borrowed from a physiological perspective, the
theory of self-producing systems, which had not yet received sustained attention
in IR. I have argued that the theory’s distinction between organization and
structure and its principles of organizational closure and structural determinism,
which can respectively account for the system’s autonomy and conservative
development, offer an alternative systemic perspective to the way we typically
frame the international system (as an environment/externality that is merely the
product of inter-state competition).

Armed with this new systems theory, I have challenged important assumptions of
IR. I have offered a new theory of international sovereignty that highlights its
organization as a closed network of self-production, (re)produced in and through
exclusionary international practices. I have then used this reconceptualization of
sovereignty to challenge the foundational idea that the international system is an anarchy. I have argued that, like in a superorganism, sovereignty processes take place both at the state level and, increasingly, at the international system level. I have concluded that the international system is a stratified structure: it is anarchic at the top, at the level of inter-state relations, but this anarchy sits at the apex of and is made possible by a more fundamental hierarchy between sovereign states and other unrecognized actors. The processes through which this stratified order is maintained, I have argued, are increasingly international. This redescription of the structure of the international system has enabled me to rethink the corporate interests of individual states to include the position of the system itself in its environment. States are not only self-interested but also fundamentally class-interested; they constitute a powerful aristocracy with a keen interest in the reproduction of their position of dominance in world politics.

And finally, from a developmental perspective, I have challenged the widespread belief that the evolutionary origins of the contemporary international system will give us straightforward answers about its future. I have argued that, once we take into account the most recent evolutionary transition in the international system, we are forced to accept that, since the international system has de-Darwinized and become an individual, a developmental perspective, not an evolutionary one, will give us answer about its future transformations. In this vein, I have provided an alternative, developmental take on the relationship between the international system and globalization, and suggested how the emphasis on the endogenous relationship between system and environment in developmental cycles solves
many of the shortcomings of traditional evolutionary approaches to the topic. Indeed, the developmental perspective I proposed in Part C can say a small number of important things about the future of a developing system, notably by giving us a sense of the system’s developing potential, and it can capture endogenous system-environment relationships, such as those that characterize the system’s relation with the globalizing processes that appear to challenge it.

*Empirical claims*

In the course of my redescription of the international system, I have made a number of claims about the character of the contemporary international system which I would like to summarize here. In chapter 2, I have argued that the international system after WWII exhibits all of the key criteria for a METI, namely the decline of conflict, increase in cooperation, integration, and organization, and the displacement of natural selection pressures to the level of the whole system. More concretely, I have argued that the following key contemporary international political trends are constitutive of a METI: the significant decline in inter-state war, and most centrally the complete disappearance of Great Power wars, which had been in past centuries the main mechanism of change in international politics; the significant increase in inter-state cooperation and integration, and the parallel quantitative and qualitative increase in inter-governmental organization; the abundant evidence that selection pressures are increasingly taking place at the level of the whole system, such as the virtual disappearance of state death and territorial conquest, the
increasing net benefits from statehood, and the observed displacement in typical collective security concerns from international threats – the revisionist state – to external sources of threat, such as violent non-state actors, poverty, epidemics, and cyberterrorism, among other phenomena in the environment of the international system. I have suggested that these international trends constitute a de-Darwinization of the international system’s internal environment and the simultaneous displacement of Darwinian pressures to the level of the system and its own environment.

In chapter 4, I have argued that the differential life chances between recognized and unrecognized entities in the international system reported by Strang are evidence of a boundary between the international system’s internal environment and its external environment constituted by the operation of sovereignty at the international system level.839 I have also argued that the international system is a self-producing system and identified its organization (sovereignty as a closed network of self-production) and historical structures (principles of differentiation of sovereignty). Building on the METI argument, I have established analogs to the emergence of system cognition, immune reaction, and the centralization of reproductive functions, the three key de-Darwinizing mechanisms of a METI. I have argued that today, the international system clearly exhibits all three mechanisms, as evidenced by the growing focus on non-state sources of threats, the overwhelming collective reaction against terrorism, and the contemporary centralization of state recognition practice and its reliance on abstract criteria. I

have also concluded that, from a historical perspective, the first time the international system showed clear movement towards individuality on all three of these de-Darwinizing mechanisms was at the Congress of Vienna (1814). There, the statesmen who participated in the establishment of the Concert of Europe clearly exhibited a sense that the European system was distinct from its societal environment, committed to the defense of the balance of power and monarchy, and centralized decision-making authority over recognition and intervention decisions in the hands of the Great Powers.

Finally, in chapter 6, I have suggested how the latest transformation of sovereignty, the Responsibility to Protect, is a conservative change in the structure of sovereignty that can be interpreted as performing the function of protecting self-production. I have suggested that R2P can be interpreted as a response to the tension between territorial sovereignty and norms of popular sovereignty, which had themselves been responses to prior issues with national sovereignty (self-determination). R2P can thus be seen as a further development of sovereignty placating the controversies over intervention resulting from these tensions. I have used the concept of development cycle to offer a narrative of the development of sovereignty programs, which I had argued earlier, represent the structure of the international system.

**How my contribution should be judged**

Of course, none of these claims is unproblematic. Taken individually, each empirical argument in this dissertation appears like one interpretation among
many possible alternative ones. As a whole, however, I believe that extent to which these claims support and are complementary to each other should increase our confidence in their collective and individual plausibility.

In addition, as I have pointed out, these arguments are not causal claims. I have not argued that the decline of war, the growth of cooperation, the rise of system cognition, or other phenomena have caused the international system to become an individual superorganism. Rather, I have argued that these phenomena constitute a transition towards individuality, and that if this interpretation is correct, they signify that the international system is a superorganism. I have taken these empirical observations as evidence that my arguments about the character and transformation of the international system are individually and jointly plausible interpretations.

How should we evaluate my argument, beyond its empirical plausibility? In the epigraph that opened the introduction, I cited a passage in which Thomas Kuhn suggested that the choice of a theory is about more than a comparison between the theory and empirical ‘reality’, but that it is also and most importantly a comparison between the new theory and older theories. In the dissertation, I have proposed a new, comprehensive ontology of the international system from three complementary biological perspectives. How do these new perspectives compare with the old, namely international anarchy and the traditional Darwinian assumptions that underpin it? As I have noted above and pointed out
throughout this dissertation, I believe that the new theory I offer comports many significant theoretical advantages over the traditional frame.

The most important of these advantages is its ability to offer a unified account of the international system’s history, recent transformations, contemporary structure, and transformative potential. Indeed, the three perspectives on the international system are consistent with one another and offer complementary insights. Together they offer a comprehensive picture of the international system and its past, present and future transformations, and as I have noted, this unified picture offers a plausible account of many of the most important international political trends we observe today. The METI hypothesis of Part A captures the pacification of inter-state relations, growing cooperation, integration and organization, shift in securitizations from state-based to non-state actors and phenomena, such as terrorism, piracy, poverty, global epidemics, etc. The physiological perspective of Part B captures the international system’s resilience and capacity to persist. And finally, the developmental perspective of Part C is not only the logical extension of the empirical claims of Parts A and B, but also promises to solve the shortcomings of existing evolutionary perspectives on international system transformation and to give us a way to begin thinking about the transformative potential of the international system.

As the great chemist turned philosopher of science Michael Polanyi put it, scientific decision is an act of personal judgment and when making such judgment, we always bring to bear more background (tacit) knowledge than we
can recall.\textsuperscript{840} As such, I expect my readers, which will undoubtedly consist in IR scholars for the most part, to know a great deal more about international politics than they can even tell. It is ultimately up to them and their educated judgment, not to mechanistic reference to any set of external criteria for validity, to decide if the theoretical perspective I have offered holds more plausibility and promise than the previous paradigm.

In the course of making these arguments, I have preferred to cover a lot of ground in order to provide a comprehensive redescription of the international system from a biological theory perspective. Of course, to do so I have had to bypass many issues that could have been addressed in much greater detail and thus, I have had to weaken my flanks considerably. This dissertation is meant to be a programmatic statement, but I could not deal with all the issues it raises, although I believe that I was able to establish a foundation on which we can begin to build on many of these issues.

The international system is a vast global complex that spans across multiple issue areas. My focus has been on the core organization and structure of the system, and I have tried as much as possible to keep my discussion of international practices at a general level. I have for the most part avoided dwelling too deeply into discrete practices, such as war, trade, immigration, surveillance, etc. Notably, while I have argued that a developmental approach solves many problems the evolutionary perspective on the international system under

\textsuperscript{840} Polanyi 1968.
globalization, with the exception of my discussion of the latest developmental cycles of sovereignty (and R2P in particular), I have not been able to perform in-depth case studies of key transformations in given issue areas.

*Consequences if I am right*

If the international system is a developing superorganism, this will have important consequences for the practice and study of global politics. First, this will mean that there is a greater potential for cooperation and coordination in the international system than what the anarchy problematic has led us to expect. Our baseline expectations about the quality of life in the international system should be revised: if the international system is de-Darwinizing, inter-state relations will increasingly resemble the integrated, cooperative and shielded internal dynamics of an organism. Multilateralism will be the behavioral norm. What is more, we should expect multilateral, collective security dynamics to be reoriented towards the management of threats and risks emanating from non-state actors and phenomena in the environment of the system. If the international system is a self-producing system with a stratified structure, as I have argued, states should share a deep solidarity in the maintenance and defense of their shared position atop global politics. While this makes for a potentially more peaceful world at the level of inter-state relations, much inequality and potential for violence will remain, especially at the level of the system’s immune reaction to various pathogenic threats within (‘tumorous’ rogue states) and without (global terrorism, ISIS, global criminal networks, etc.)
How long can we expect the international system superorganism to ‘live’? Already, some international political observers are pointing out contemporary changes that threaten the integrity of the international superorganism: the rise of China, the return of an assertive Russia, ISIS, etc. Will these changes disrupt the international system’s movement towards individuality? If the international system is becoming a superorganism, we can expect it to respond to threats so as to preserve the closed network of self-production, and in doing so, to continue developing. Challenges, through development, may then turn into greater strength. METIs and the individual superorganism that emerges with them are never completed.

If true, the claims of this dissertation significantly challenge the widely shared assumption that Darwinism legitimates the Realist perspective on international politics. I have shown that the latest evolutionary thinking is consistent with international political phenomena typically associated with Liberalism and Constructivism. METI theory shows how cooperation can be a driving force behind evolution. Far from fearing biological theories, Liberals and Constructivists would gain from familiarizing themselves with the latest developments in evolutionary biology.

If my claims are true, this should have important implications for IR theory. Most crucially, it would mean that we have to begin studying the international system itself, apart from states that compose it. The highest level at which we have thought systemically about the international system has been the Third Image.
From the perspective of the Third Image, the international system was understood as an environment produced by inter-state relations and characterized by its feedback dynamics. Now we can begin thinking about the relationship between the international system and its own environment (instead of equating the international system with its environment. I have suggested that this would constitute a Fourth Image of international politics. I have laid down the conceptual and theoretical foundations for such a perspective, but much work needs to be done to achieve a detailed description of world politics from this perspective.

Second, if the international system is a developing superorganism, it should prove particularly persistent and adaptive. Self-producing systems tend to achieve great autonomy from their environment and develop conservatively: changes to their structure are oriented towards the continuation of their organization. Because organisms, via their organization, are entropy decreasing machines, Schweller’s conclusion that entropy is rising in the international system, which he views as on the verge of being “subsumed by the inexorable forces of randomness, tipped off its axis, swirling in a cloud of information overload,”841 is greatly premature. What is more, being self-produced, the international system should be very difficult if not impossible to steer from outside. Non-state actors, NGOs and others, can trigger reactions from the system, but it is up to the system to determine how it will react. And indeed, the

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841 Schweller 2010: 27.
representatives of states should act so as to reproduce the closed network of selfproduction of sovereign authority, in which they have a vested interest.

Finally, METIs and the superorganisms they produce tend to be extremely successful ecologically, notably as a result of their dramatically increased capacity to know, adapt to and even manage their environment compared to the individuals of the pre-transition population. Social insects and humans dominate their respective ecosystems. Similarly, the international system has displaced other kinds of actors to the point that its mode of political organization dominates the globe. While inter-state peace is a good thing in and of itself, especially in the nuclear age where Great Power war could mean the complete annihilation of life on earth, the international system superorganism might not only have positive consequences. Humanity’s success will probably mean extinction for countless other species (the Anthropocene), and ultimately maybe our own. However, states greater ability to cooperate and coordinate should also mean a corresponding ability to deal with the global issues of the day. It is too early to tell, but we will have to pay attention to how the international system and its environment co-develop.

*If you do not buy my argument*

Even if you do not buy my empirical claims, there is plenty in this dissertation for IR scholars to borrow and benefit from. This dissertation should play a useful heuristic role for IR, even if one does not buy the substantive arguments I have made about the character and transformation of the international system.
Indeed, in this dissertation I have introduced a number of concepts, perspectives and theories that had not previously received any attention in IR. Even if one does not believe that the international system is becoming an individual superorganism, that the international sovereignty is organized as a closed network of self-production, or that sovereignty develops, the new theoretical materials I introduced here should nonetheless provide much food for thought and enrich our ability to describe other international political phenomena.

In chapter 2, for instance, I offered the first discussion of the problem of individuality in an IR context. While the issue has been discussed from the angle of identity, the biological assumptions that underpin dominant ways of looking at the question had remained unexamined. As I have shown, it turns out that biology has made the question of individuality one of its most important philosophical questions and from the debates in biological theory and the philosophy of biology we can gather important insights into our own assumptions about individuality. Indeed, because it underpins the questions of identity and agency, the question of individuality has much import for IR theorists.

My critique of the explanatory structure of evolutionary IR should also be of particular interest to scholars interested in systemic change. IR scholars have overwhelmingly relied on (admittedly often implicit) evolutionary models inspired by biological theories of evolution. IR scholars, however, have not appreciated the limits of the evolutionary framework on the question of change. I have argued that the widespread assumption that, for theoretical and empirical
reasons, an evolutionary perspective on the origins of the international system yields insights into its future transformation is fundamentally flawed in the contemporary era. On the one hand, evolution is notoriously blind about the future and the causal privileging and exogenization of the environment robs it of the ability to grasp the transformative potential of the system. On the other, if I am correct that the international system is in the midst of a METI, this means that we will need to move beyond evolution and think physiologically about the present of the international system and developmentally about its future.

My contribution has not only been critical. I have also introduced three new biological perspectives on systems and the issue of change which had received no attention at all in an IR context. In chapter 2 I have introduced the theory of METIs and the findings of the symbiotic revolution, which is in the process of revolutionizing how biologists think about the levels of selection and the role of cooperation in evolution, as well as the nature of biological individuality. I have used this new perspective to argue that contemporary international political trends amount to a major structural transformation of the international system. In chapter 3, I have introduced a new systems theory that has yet to receive any sustain attention in IR, the theory of self-producing systems. I have applied the theory to the hard case of the international system, but many other applications are possible and plausible. The individual state is a candidate, but we should also evaluate the extent to which other systems are autopoietic, such as the international legal system, given the fact that the theory has already been successfully applied to legal systems before.
Finally, and most importantly, I have offered the first articulation of development in an IR context. In biology, as I have argued, evolution and development are two distinct approaches to biological change that constitute the central disciplinary division between evolutionary and developmental biology. In IR we have not practiced this distinction, to the point evolution and developments are routinely used as synonyms for change. As I have shown, distinguishing development from evolution enables us to apply its distinct set of concepts, mechanisms and expectations to cases of changing individuals. In many situations, we are not interested in changes in populations but in changes in actual individual agents (states, IOs, terrorist organizations, the international system, etc.). The discussion in chapters 5 and 6 can thus serve as a starting point for the elaboration of development as a distinct perspective on change in IR.

**Future research**

The arguments I have made in this dissertation suggest many fascinating avenues for future research. For instance, IR scholars should think about symbiotic associations between the international system and various non-state actors. I have alluded to the importance of symbiosis in biology. A fruitful research agenda for future research would seek to apply two areas of modern biological theory – research on symbiosis⁸⁴² and immunity⁸⁴³ – to the theorization of complex global governance dynamics implicating the international system and the various

⁸⁴³ Pradeu 2013; Eberl 2010.
non-state actors in its environment. Recent biological research on symbioses and the immune system offers penetrating insights into the complex patterns of collaborations and conflict, across actor types, characteristic of contemporary global governance. Indeed, the new paradigm of ‘organization’ in biology is not the single organism but complex, ‘symbiotic’ associations of genetically-heterogeneous organisms. Despite our experience of a unique ‘human’ self, for instance, human beings actually depend on cooperative associations with various species of bacteria that outnumber genetically human cells ten to one. Modern theories of immunity can also provide key insights into the highly heterogeneous global social, economic, environmental and security governance assemblages we see today. Because how we think about the relationship between states and non-state actors has been greatly influenced by traditional conceptions of immunity, it is worth exploring how biological theorists think about immune processes in symbiotic forms of biological organization. Indeed, the old self/non-self framework is being replaced by framework in which the immune system polices patterns of behavior rather than genetic identity. Faced with complex constellations of cells and bacteria, the immune system sorts out entities based on how their behavior serves or undermines the functioning of the whole.

The same processes seem to be at work in the international system. In contemporary global governance, states increasingly engage non-state actors of different types. Contemporary global governance structures do not only include

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844 Human Microbiome Project 2012; Costello et al. 2012.
845 Burnet and Fenner 1949; Eberl 2010; Pradeu 2013.
846 Cremer et al. 2007.
states and inter-governmental organizations but increasingly incorporate non-governmental organizations.847 The same thing is observed in global security governance, with non-state actors (e.g. private military firms, insurgents and terrorist groups) playing an increased role in organized violence.848 While states still combat various sorts of violent non-state actors, such as pirates, transnational criminal networks, or terrorist organizations, they also often collaborate and even sometimes delegate governance tasks to other kinds of non-state actors, such as NGOs or private military and security companies (PMSCs). A way to think about this phenomenon is through a symbiotic take on the immune system: what codes and programs does the international system use to sort out the non-state actors it can bring to the table and those it should exclude?

Another question that my discussion of immunity raises is whether the international system needs threats in order to develop normally. Recent research in immunology shows that organisms that are not put in the presence of pathogens fail to develop normally and in many cases develop auto-immune disorders (the immune system turns on itself). In IR, David Campbell has argued that the state needs to represent threats to itself in order to develop as a state. Should we expect the same processes at the level of the international system, as inter-state war and conventional sources of threat recede into the background?

848 Avant 2005; Singer 2006; Avant, Finnemore, and Sell 2010
Could this explain the multiplication in the types of securitizations after the Cold War and the ‘overreaction’ to terrorism that John Mueller describes?\(^{849}\)

Another area for future research is to examine the consequences of the universalization of the state systemic mode of political organization. Today there is no place on earth that is not under its formal governance. However, there are areas where states are ‘failing’ to assert their authority. These failed states have been identified as one of the central contemporary global security threats. Poverty, disease, radicalism, terrorism: all of these threats are believed to fester in failed states. Bolstering state capacity has correspondingly been a central objective of states. How do failed states threaten the international system? Assuming failed states are akin to a rupture in the membrane of the international system, to what extent does a ‘watertight’ membrane benefit individual states? Once the international system’s membrane is ruptured, how do the costs of boundary control increase for other states?

Finally, one of the most vibrant areas of research in contemporary IR is the so-called “practice turn.” Many IR scholars have taken to studying practices and the metatheoretical questions that they raise. Notably, because they are seen as potential sources of stasis and change, the question of how best to theorize change in practices has recently come up. Adler and Pouliot, the two leading figures of this movement, have thus called for more work on the evolution of

\(^{849}\) Mueller 2006.
practices. But is evolution the best way to think about the transformation of practices? In this dissertation, I have argued that development, not evolution, helps us make sense of the pattern of conservative change we observe in international practices. When explaining the conservative nature of practices, however, practice turn theorists in IR have emphasized the cognitive sources of stability. Pouliot’s logic of practicality emphasizes the “tacit and inarticulate” character of practices and Ted Hopf’s logic of habit points to the power of doxa and neural pathways to preclude reflexivity.

While Hopf is pessimistic about the prospects for change in practices, Pouliot suggests that change is possible but that it will originate from existing practices. Existing practices, in this view, are generative of new practices. These observations suggest that practices change endogenously, and that they are not strictly the product of exogenous, environment pressures. Pouliot and Hopf elide another source of stability in international practices: the competence politics of practice. In chapter 4 I have suggested taking a competence model to understand sovereignty practices. Competent practitioners have a vested interest in the maintenance of criteria of competence, because it is by virtue of these criteria that they are recognized as competent practitioners.

These observations suggest that the self-producing systems approach I have proposed in this dissertation, and its corresponding developmental model of change, could be fruitfully applied to the case of change in practices.

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851 Hopf 2010.
Development, more than evolution, might be a more appropriate model for change in practices.
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