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Communication, Complexity and Empire: The Systemic Thought of Harold Adams Innis

by

John Bonnett

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the School of Graduate Studies and Research
in partial fulfilment of the requirements for the
Ph.D. degree in History

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Abstract:

Harold Innis is arguably the most influential social scientist Canada has ever produced. Nearly fifty years after his death in 1952, his writings on Canadian economic history and history of communication technologies are still highly regarded, still widely cited and still viewed as providing an exceptionally powerful framework for interpreting the histories of societies past and present. The problem, however, is that scholars remain uncertain as to the identity of Innis' framework due to his opaque writing style. There is also a sense in the literature that Innis' work on staples is conceptually linked with later studies tracing the impact of communication technology on the rise and fall of empires in the Near East and Europe. But without a clear conception of his framework, the relationship is difficult to assess. Some scholars have questioned whether Innis' work even has an underlying coherence.

The purpose of this study is to suggest Innis' work should be construed as a sustained exploration of the nature of economic and social change. His purpose was to resuscitate the dynamic worldview he associated primarily with the writings of Adam Smith and biological disciplines such as ecology and embryology. To interpret Innis, this study uses the most contemporary expression of ecological change, namely that provided by the science of complexity. Through a reading of Innis' writings on staples, *Political Economy in the Modern State*, and his two major communication studies, this study suggests Innis' description of change contained several persistent features. The first is he studied systems comprised of multiple agents who by virtue of their interaction displayed emergent properties that persist over time. The North Atlantic trading network was one example. Innis also emphasised that his systems were governed by a variable that maintained a proper balance between freedom and constraint. Without it, self-organisation could not occur. In his early work, the variable was transportation. In the later studies, it was the quantity of circulating information. Finally, Innis pointed to systems governed by formal and final cause. They interacted with their surrounding environment to preserve their formal integrity, and regulate the activities of their constituent parts.

Acknowledgements:

It is a truism, but it is a good truism, and one that bears repeating often if only to keep authors humble, that a written work is the product of many hands. Only one name is usually placed on the by-line, but without the faith, the inspiration and the wisdom of family and friends, teachers and colleagues, such a by-line would never see the light of day. John Donne was right. No man is an island.

I would first like to thank my supervisor, Chad Gaffield. He deserves more than the few lines I have here to give him. I know of few individuals as devoted as he is to instilling the ethics of creativity, curiosity, and generosity in his students. I noticed these qualities when I first came to the University of Ottawa. I notice them now. He is also one of the few men I know who hasn't met an idea he didn't like, even if he disagreed with it. He has listened to almost all of mine, some good, some not so good, and some I'd prefer not to think about, with civility and humour, grace and patience, and I thank him for it. He is one of the finest exemplars of the Oral Tradition that I know.

I would also like to thank the readers who consented to comment on the preliminary drafts of this dissertation. At the University of Ottawa, I am especially indebted to Steven High for his extensive comments and his constant encouragement. He has elevated the material presented here. He has elevated the work of all who have had the privilege of studying with him. I am also grateful to Liz Combes and Robert Neufeld. While I was reviewing the *Innis Papers* at the University of Toronto, they opened their house to me, providing me not only their hospitality, but also the far more valuable gift of their friendship. Finally, I would like to thank Brian Villa. He has taught me much of the historian's craft in the decade that I have been privileged to know him, but the lesson I prize most is the one that he embodies rather than states. Namely, that when the past is approached with flexibility in conception, and dignity in exposition, there is joy in execution. Thanks Brian.

I would also like to thank colleagues and friends at the Institute for Information Technology at the National Research Council for their comments, and for exposing me to trends in information management that I would never have encountered in an archive or in the *Innis* literature. They have accused me of changing in a small measure the way they think. They should know they have changed in a large measure the way I think. Their imprint is on this thesis as well, particularly in the sections devoted to visualisation.

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Introduction:

A prophet is not without honour, save in his own country, and in his own house.

- - The Gospel According to St. Matthew 13: 57

Harold Innis would have resisted identification of himself with the above epigram, for he was many things. He was modest. He was hard working. He was brilliant, ribald, and a scamp.¹ But he was not pretentious. Unlike prophets, Innis would have disavowed claims of inspiration by the Almighty. A former Baptist, he would have greeted comparison with the Son of God with a mixture of displeasure and derisive laughter. Still, there is much to commend in Jesus' description of the prophet when thinking about the career of Harold Adams Innis. Like most prophets, Innis had much to say that was important to his country about its past, present, and future. And like most prophets, Innis has often been misunderstood. He never spoke in parables, but his prose had a similar effect on his audience. Praised by Marshall McLuhan as ideogrammatic, other scholars castigated his writings as an abomination of the English language, materials with a penchant for snatching obscurity out of the jaws of clarity.² In a 1947 review *The Economist* ruefully noted that: "Incoherence, indeed, is Professor Innes' [sic] besetting sin."³

In the aftermath of his death in 1952, Innis posthumously has paid a price for this sin. He is now an obscure figure in Canada, known only to a cross-section of academics and graduate students. In a 2000 *Maclean's* survey of Canadians

who inspired the world, Innis' name was nowhere to be found. The omission is not surprising. Harold Innis is an awful read. When it comes to Canadian theorists of communication, it is McLuhan, not Innis who has received popular global approbation.⁴ Inside the academy, however, Harold Innis remains a respected figure, albeit one in which scholars have learned to hate the sin and love the sinner. Judith Stamps notes of her initial encounter with Innis that "it was the strangest text I had ever seen. I could only vaguely make out its meaning, but I had the sense of being in contact with something profound."⁵ In a recent historiographical essay, Charles Acland and William Buxton suggest similar insights have stimulated a renewed scholarly interest in Innis' writings: "There is something about his work -- its intellectual breadth and theoretical shifts -- that lends itself handily to reinterpretation."⁶ There is a sense, then, almost a statement of faith, among Canadian scholars that Innis is among the most profound thinkers Canada has ever produced. In an era in which globalisation and new communication technologies transform and task us, Innis still has much to teach us. Canadians would do well to learn more about him.

But for all the approbation, there is still the matter of Innis' besetting sin. Acland and Buxton note that scholarly interest has also been tinged by frustration, a feeling akin to that displayed by initiates in front of a prophet who simply refuses to get to the point. Hugh Aitken perhaps best voiced this sentiment in 1977. As a student of Innis at the University of Toronto he recalled that "to be taught by Innis and to learn from Innis called for an act of faith. You had to believe that there was something really important there. Grains of doubt crept in

from time to time -- can anyone honestly deny it? Perhaps the Emperor had no new clothes after all."⁷ Acland and Buxton note that most scholars continue to see him fully clothed, since for the past 30 years his name has continued "to come up, showing that there is a consensus that he initiated something important, though the consensus-makers may not be sure what."⁸

Innis interpreters have faced a challenge, then, in recommending his writings to scholars within Canada and without. Aside from agreeing that Innis initiated something important, and that his early and late writings share a common framework, scholars have been unable to point to a consensus on the identity of Innis' framework. Consequently, scholars have also failed to reach an agreed definition of Innis' place not only within Canadian letters, but also, to the extent that they have considered the subject, in the larger fields of international economic and cultural historiography.⁹ Acland and Buxton suggest that for many Canadian interpreters, initial interest and confusion has recently transformed into a state of disaffection: "The demonstration of high regard for Innis' work sometimes has the same enthusiasm as an obligation to visit a relative one doesn't really like."¹⁰

The purpose of this study is to suggest that Innis' writings deserve a renewed place of prominence in scholar's social calendars. There is a coherence, a unity of purpose in Innis' writings, one that has not been properly demonstrated in the literature. The entirety of Innis' work -- staple and media studies alike -- can and should be viewed as a sustained exploration of change, and more specifically the variant of change governing human history. Innis' purpose

throughout his career was to demonstrate that the patterns of Canadian economic and global history should be identified with the characteristics of ecological change. Societies are systems, governed by rules that pertain to ecological systems. Innis' aim was to demonstrate to his contemporaries that cultures which historically had operated within the constraints of these rules, through default or design, had prospered and endured. By contrast, cultures that had violated these strictures had not. Instead, they collapsed.

Harold Adams Innis was born in Otterville, Ontario in 1894. Raised in a poor, devoutly Baptist farming family, Innis was nevertheless encouraged to develop his aptitude for learning and scholarship, despite his family's material privation. Throughout his life, Innis seemed to live with a characteristic wilfulness. In life, it propelled him to produce a remarkable corpus of work, devoted to the history of Canadian extractive industries, be it fur, cod, or wheat, and his own take on the history of Western Civilisation, based on communication media and the Oral Tradition. On the eve of death, his wilfulness motivated him to deny the existence of the cancer that would prematurely end his life in 1952, to the distress of his family and friends.¹¹ But in youth, Innis' determination enabled him to overcome his and his family's limited means. Starting in a one room school house, Innis through a combination of hard work and talent advanced to High school, and then McMaster University in 1913.¹²

Innis rarely had trouble discerning what he wanted out of life. Overall, it was a trait that stimulated great achievement. In a minority of instances, it propelled him to commit acts of great folly. Innis' biographer Donald Creighton

reports that Innis, upon beginning his first term at McMaster University, quickly realised his financial resources were barely sufficient to maintain a subsistent standard of living. Instead of asking his parents for financial assistance, he subjected himself to a regime of stringent penury, arriving home in Otterville for Christmas emaciated, and ready to end his university career. Innis' family prevailed upon him to continue, this time with assistance from home. Overall, though, Innis' determination to learn stood him in good stead at McMaster. He enjoyed a successful university career from the winter term of 1914 until his graduation in 1916. Michael Gauvreau suggests that in his time there, Innis became exposed to the questions and concepts that would preoccupy him for the remainder of his career. The central question of his communication studies, "Why do we attend to the things to which we attend?", was first posed to him by his philosophy professor at McMaster, James Ten Broeke.¹³

After graduating in 1916, however, Innis joined the Canadian Army, and concerns about philosophical constructs gave way to the more pressing problem of staying alive as an artillery gunner in World War I. According to Donald Creighton: "The war was the second great influence in his life. . . . With little preparation and with almost no appreciation of what was involved, he was suddenly caught up in a life of fast movement, and violent activity, and deadly peril."¹⁴ Life at McMaster had taught Innis that Western Culture was subject to inquiry. Life as a soldier in World War I would teach him that it was subject to catastrophe. Innis was circumspect about the horrors he saw at the front, but even a cursory review of his later writings indicate that they affected him deeply. In

the last decade of his life Innis would interpret World Wars I and II as symptomatic of a civilisation in decline.¹⁵

In July 1917 Innis was injured in the leg at Vimy Ridge, and removed to Britain for treatment and subsequent discharge. During his convalescence, Innis made the shift from soldier to graduate student, beginning research for a dissertation devoted to the problems associated with repatriating Canadian soldiers after the war. Returning to Canada in April 1918, Innis was discharged from the army and completed the requirements for his Masters Degree the same month. The following fall, Innis entered the PhD program in Economics at the University of Chicago. There, Innis completed a thesis devoted to the history of the Canadian Pacific Railway, and there, Innis focussed on a third insight regarding human cultures. Not only were they subject to critical inquiry, and subject to collapse, societies were also subject to a specific form of change. Introduced to the writings of Thorstein Veblen, Innis as we shall see in Chapter Two would employ them in the 1920s to argue for the reconstitution of economic theory. Economists could no longer rely on the mechanical constructs of change embedded in classical economics. Economic systems were not static entities. They emerged. They evolved. They transformed themselves. As arenas of change, they were more akin to biological than physical systems, displaying patterns of change found in embryology and ecology.¹⁶

After the completion of his doctorate in 1920, Innis accepted a position with the Department of Political Economy at the University of Toronto. During his tenure there as a scholar, professor and administrator, Innis emerged as one of

the most prolific scholars in the history of Canadian letters. In 1930 and 1940, he respectively published *The Fur Trade* and *The Cod Fisheries*, the two works that would distinguish him in the field of economic historiography. In each work, he would proffer the staple hypothesis, the proposition that the constitutions of Canada's social, economic and political structures were derivatives of the initiating stage of European economic activity in each region. If the culture of the Maritimes differed from that of Central Canada, it was because the inhabitants of that region had historically extracted a different commodity, or staple, from the environment.¹⁷

In 1946, Innis' career took a radical turn. With the publication of *Political Economy in the Modern State*, Innis turned his attention from economic systems to the more multi-dimensional problem of cultural systems. In making the shift, Innis' object was to identify the problem of the West. In the first half of the 20th century, the peace of Europe and North America had collapsed twice, and Innis proposed to explain why. His solution was as surprising as it was simple. Cultures became dysfunctional because they failed in the fundamental task of information management. For Innis, information was a tool to stimulate creativity. When cultures lost control of the information circulating within, they invariably became rigid or unstable in their thinking, and often violent prior to their collapse.¹⁸

The problem of information management would also preoccupy Innis in his two most famous communication studies, *Empire and Communications* (1950), and *The Bias of Communication* (1952). In each, Innis proposed to study

the history of Western Civilisation, from ancient Egypt to the present, in parallel with the history of communication technology. In each, Innis would reiterate his belief that a culture's success was predicated on its success in managing information. And in each, Innis would also argue that in cultures past and present, adoption of a new communication technology had historically prompted a concurrent, or subsequent, adoption of a new construct of time, a construct with a bias either toward space or time, and in rare instances, space/time.¹⁹

By the time Innis completed his first communication study in the mid-1940s, he had already distinguished himself as a scholar who had a great deal to say to Canada, the U.S. and Europe, having published scores of articles in addition to his major staple studies. And for the most part, Innis' writings earned him the respect of his colleagues, even if they did not agree with him, even if they failed to completely understand him. The respect he received was later transformed into recognition, through promotion, and through honour. In 1937, Innis was appointed Chair of the Department of Political Economy, and in 1947 he became Dean of the University of Toronto's Graduate School. Academic honours soon followed. Innis was made President of the *Royal Society of Canada* in 1947, and President of the *American Economics Association* in 1951. He served on royal commissions, funding bodies such as the *Rockefeller Foundation*, received honorary doctorates, and was invited to lecture at Oxford in 1948, and the Collège de France in 1951.

And then, in his prime, Innis stopped. After suffering persistent back pains in the winter of 1952, Innis discovered he had terminal cancer. He

succumbed the following November. Eric Havelock would perceptively characterise Innis' premature death as a disaster in the history of Canadian letters.²⁰

In the half century following Innis' death, scholars have sought to understand him, and, as we have seen, they have collectively emerged in the 21st century with the uneasy sense of not having attained a great deal of success. At base, Innis interpreters have sought to accomplish two goals, to demonstrate that Innis' early and late works are unified under a single framework, and to unearth the identity of that framework. The supposition of this study is that Innis' work -- early and late -- was an attempt to characterise human society as an ecological system. As such, the disparate sub-systems of society, be they economic, be they cultural, were subject to the governance of the form of change specific to ecological systems. The basis for this supposition comes from a statement made by W.T. Easterbrook shortly after Innis died, that Innis "throughout remained a disciple of Adam Smith and no name appears more frequently in his observations on economics past and present."²¹ Robert Babe has also recently noted that Smith's "influence on Innis was probably much greater than is generally recognized."²²

Smith's writings had a specific significance for Innis. Citing Alfred Marshall, he would refer to them in *Political Economy in the Modern State* as architectonic, offering "the great concept of society as a whole." Smith's writings were distinguished, Innis argued, by their suggestion that societies and economic phenomena "were manifestations of an underlying order in nature governed by

natural forces." Smith's insights into natural law were sufficiently powerful, in Innis' estimation, that they influenced the subsequent development of biology and the social sciences. Darwin's theory of natural selection traced an intellectual lineage back to the writings of Smith, while the economics of Thorstein Veblen stemmed from ideas first voiced in *The Wealth of Nations*. In short, Innis identified Smith with an ecological construct of change.²³

Aside from Innis' intellectual debt to Smith, the suggestion that Innis' writings are informed by an ecological or systemic conception of change also stems from numerous statements to that effect in the literature. Innis interpreters such as Vincent di Norcia, Paul Heyer, Barrington Nevitt, William Melody, David Crowley, James Carey, Judith Stamps, Ian Parker, and Cole Harris have all noted Innis' appeals to ecological or holistic constructs of change.²⁴ While all have made valuable contributions by highlighting this dimension of Innis' thought, they have nevertheless suffered from a defect that stems from the peculiar nature of Innis' prose. As Ian Parker observes, Innis' writings are grounded "in detailed historical study of particular systems."

As a result, notwithstanding some passages that appear to summarize aspects of his theoretical position, most of his analytical framework is *only* available in *implicit* form and can only be extracted and rendered *explicit* through an extended inductive process involving a period of intensive absorption in his work.²⁵

Parker's observation suggests that given the nature of the material, it is difficult if not impossible for interpreters to make affirmative statements

regarding Innis' views on change within the span of a periodical article. Instead, an effective demonstration of the worldview in Innis' early and late writings can only be provided in a monograph or dissertation-length study. Such a format affords the opportunity to provide the in-depth examination and interpretation that Innis' materials require, and such a genre allows for extensive quotations from each work, in order to make explicit the common framework embedded in his disparate studies.

To date, no such study has appeared in the literature, and it is this gap that this study seeks to fill. While a few monographs devoted to Innis' writings have appeared in the past 20 years, none have addressed this topic specifically. Arthur Kroker's study is devoted to Innis' beliefs regarding the social and political effects of technology, while Judith Stamps emphasises Innis' writings on epistemology. Graeme Patterson's study does address Innis' views on historical change, specifically the role of formal cause, but the focus of his attention is Canadian historiography, not Innis.²⁶ Given Parker's assessment of Innis' writings, then, it can be suggested that the constructs of change presently circulating in the Innis literature are based more on assertion than demonstration. The assessments are not necessarily wrong, but the literature does require the benefit of a more substantial evidentiary base before an ecological construction, or any construction of change, can be simply assumed. That is one task this study will endeavour to fulfill in the following chapters.

A second task, which we will address in our first chapter, will be to provide a more precise definition of change, be it the mechanical change that

informed classical economics, or the ecological change that Innis tried to instil in his own writings. More specifically, we will provide a definition of ecological change consistent with that provided by scientists in the emerging interdisciplinary science of complexity. Researchers in this field study *complex adaptive systems*, and suggest that they are ubiquitous in nature and human society, including the economy. As we shall see, they also suggest that they share a number of common features. They are composed of numerous agents, which interact one with another. By virtue of their interaction, the agents self-organise into systems, systems that display emergent structures or properties that persist over time.

Complex adaptive systems are also distinguished by the governance of formal and final cause. In the case of formal cause, once a system emerges, it begins to regulate the behaviour of its agents or constituents, assigning specific tasks to specific agents. A bee, for example, in isolation can potentially perform a variety of roles, from reproduction to construction. Once it is embedded in a colony, however, formal cause operates to limit its activities. If it becomes a labourer, it will not reproduce. Complex systems show the governance of final cause in that they display behaviour that can be construed as purposive. As we shall see in our next chapter, such systems are not passive conduits for matter and energy. Instead, they operate much like economies. They actively interact with their environments, appropriating materials to maintain their existence.

As we shall also see over the coming chapters, the template of change associated with *complex adaptive systems* will prove extremely useful for

unearthing the construct of change embedded in Innis' writings. It will also enable us to measure the extent of Innis' knowledge regarding the characteristics of ecological change, and emergent systems. As we shall see by the time we reach our conclusion, Innis knew a great deal.

In our second chapter, we will examine Innis' first three major works, his *A History of the Canadian Pacific Railway*, "The Work of Thorstein Veblen," and *The Fur Trade*. We shall also argue that Innis' essay devoted to Veblen was as close as he ever came to issuing a statement of his intellectual agenda. In the essay, Innis made clear his resistance to the dominance of mechanical forms of change in economic analysis, and his belief in the need to appropriate alternative models from disciplines such as biology. As a young economist, Innis believed the discipline needed to be reconstituted, and he recommended that he and his young peers make the attempt. His study of the CPR is of interest because it suggests that Innis formulated the intellectual agenda he later pursued while a graduate student at the University of Chicago. The preface and the conclusion of the study both anticipate Innis' interest in change, and the studies in staples industries that he would produce from 1920 to 1940.

As a study of economic change, however, Innis viewed his first monograph as something of a failure, and it not until *The Fur Trade* that Innis produced a study that met the expectations that he had set for himself. There he would provide an evolutionary history of Canadian institutions, one demonstrating their emergence as a result of agent interaction with other agents, with the environment, and Europe. He would also emphasise that the attributes of

Canada's institutions -- like *complex adaptive systems* -- persisted through time, and were governed by formal cause. To understand the internal organisation of Canada's economy in the 1930s, one had to study its origins in the 1630s.

In Chapter Three, we shall examine *The Cod Fisheries*, and we shall focus on one attribute of emergent systems that Innis highlighted in his disparate studies of the Atlantic fisheries: increasing-returns. In *complex adaptive systems*, the behaviour of the agents that comprise them is regulated by positive feedback. If a constituent agent acts in a certain way that enhances the survival of the system, it receives rewards. If it performs in such a way that it decreases the system's fitness, its share of resources is diminished, and at times the agent is even expelled. The same principle holds with respect to a system's interaction with its immediate environment. When it acts in a way that is adaptive, it receives resources -- or positive feedback -- from the environment. When it does not, the system perishes.

In economics, positive feedback is referred to as increasing-returns. As we shall see in Chapters Three and Five, the concept played a central role not only in Innis' economic histories, where he viewed the process as instrumental in enabling England to defeat France for hegemony over North America, but also in his later communication studies. To understand Innis' ideas on how communication technologies affect a culture's disposition towards change, one must understand the economics of increasing-returns. To learn more about the concept of increasing-returns, we shall study the writings of one of its current practitioners, the economist W. Brian Arthur, prior to a reading of "The Rise and

Fall of the Spanish Fishery," "The Economic History of the Maritimes," and *The Cod Fisheries*.

In Chapter Four, we shall examine Innis' first communication study, *Political Economy in the Modern State*. In part a political treatise, and in part a jeremiad, Innis' purpose was to provide a prescription for cultural renewal. In emphasising the problem of information management, Innis would touch on another characteristic of change associated with *complex adaptive systems*, namely that their capacity to emerge in the first place, and adapt over time, is determined by crucial inputs called *control parameters*. As we shall see, in *Political Economy* Innis saw the quantity of circulating information in societies as the *control parameter* governing the emergence of new social, cultural and economic patterns, and their subsequent adaptation. While analysing emergent systems, Innis also understood a fundamental point that would later be articulated by contemporary proponents of the science of complexity: systems can only change when they are governed by the right balance between freedom and constraint, and that mean is determined by the *control parameter*. For Innis, the quantity of circulating information in any given society was crucially important. It was a variable that explained the cultural decline he believed transpired during the 19th century. It was a variable that explained the onset of World Wars I and II.

In Chapter Five, we examine *Empire and Communications*, and *The Bias of Communication*. In both, Innis painted the history of the West as a history of constructs of change, constructs stabilised and de-stabilised by the emergence of new communication technologies, in the form of script, physical media, or genres

of speech. Innis laid particular stress on the latter, or as he referred to it, the Oral Tradition, since in his estimation it represented the communication environment most conducive to creative thought and cultural adaptation. As we shall see, it also suggests Innis' belief that cognitive structures are themselves emergent systems, subject to the governance of formal cause. We shall also see that Innis did not hold a position commonly ascribed to him, namely the supposition that certain media invariably predispose cultures to embrace constructs of change biased towards space, while other media lead to a disposition toward time. Innis did not see a linear relationship between the physical properties of any given medium, and a particular construct of change. In his narratives not every culture using papyrus, for example, retained a bias towards space. In the case of ancient Israel, the prophets employed papyrus to champion a worldview predisposed toward time. In ancient Rome, by contrast, papyrus supported the culture's disposition toward constructs emphasising space. The relationship Innis drew between agents and media was far more complicated than is traditionally assumed in the literature. It was a relationship that emphasised contingency. It was a relationship that emphasised human freedom. But most of all, it emphasised the regulation of ecological change.

Harold Innis ended his career much as he began it. He believed it vital that cultures understand the regime of change in which they operate. Such had been his concern in the staples studies. In *The Cod Fisheries* in particular, he stressed the importance of agents, their ability to self-organise, and the importance of increasing-returns in mediating the fortunes of the European

empires occupying the perimeter of the North Atlantic. In his staple and communication studies, Innis would also emphasise the importance of balance between liberty and constraint. Maintenance of proper balance would enable Canada's institutions to emerge and thrive. Neglect of the requisite balance would precipitate the catastrophes of World Wars I and II, catastrophes that Innis was by no means certain the West would avoid in the second half of the 20th century. In early study and late, Innis would also emphasise the importance of formal and final cause, suggesting both forms of causation provided room for the individual and collective creativity he desperately wanted to nourish. Innis' purpose throughout was to illustrate the constraints imposed by ecological change, the dangers they imposed, and the opportunities they wrought. Let us see how.

Chapter One: Constructs of Change

Harold Innis' writings enjoy an underlying coherence. They can and should be characterised as a sustained meditation on the nature of change. Throughout his career Innis' object was to demonstrate that systems -- first economic, and then cultural -- are governed by a specific regime of change. In making these assertions, the key challenge to be faced here is to identify the regime of change he employed. As was stated in the introduction, Innis offers little help. His prose is renowned for its obscurity, and its penchant for concrete description. If an underlying coherence is to be detected in Innis' writings, we will need to consult other sources, specifically those providing precise descriptions of mechanical change, which this study suggests Innis resisted, and ecological change, which this study suggests he embraced. The purpose of this chapter is to do just that, prior to beginning a reading of Innis.

Descriptions of mechanical change are rife in a variety of literatures, and are easy to obtain. They have been since the onset of Sir Isaac Newton's theory of celestial mechanics, the template from which abstract constructs of mechanical change are derived. If anything, the available formulations have been too plentiful. According to Milic Capek, appeals to mechanical change have been so ubiquitous that they have seeped into the "intellectual subconscious" of the West. Appeals to terms such as "motion" and "displacement" to describe change indicate "the reluctance of our Newtonian subconscious to depart from traditional habits of thought."²⁷ Given, then, that Newton's theory has been with us for some 400

years, and that the essential features of mechanical change are well known, there is no pressing reason to prefer one discipline's description of mechanical change over that of another. In this chapter, we will rely on the description of Newtonian mechanics provided by Floyd Merrell in his critique of the philosophy of Structuralism. We will also rely on the depiction provided by the philosopher Alicia Juarrero in her book *Dynamics in Action*.

While there is no reason to discriminate one discipline's formulation of mechanical change over another, a similar statement cannot be made for descriptions of ecological change. Researchers in the science of complexity are the most recent proponents of ecological change, based on formulations drawn from the study of *complex adaptive systems (cas)*. Its proponents argue that *cas* are ubiquitous in nature. They are found in contexts ranging from the human economy to cellular biology. The same researchers also note, however, that the defining features of *complex adaptive systems* -- the governing rules associated with ecological change -- cannot be derived in their totality from examination of any one type of system. An obvious feature in one context may be hidden in another. The study of *complex adaptive systems* is of necessity an interdisciplinary enterprise, one with formulations that continue to be works in progress.²⁸

From the standpoint of interpreting Innis, the study of *complex adaptive systems* offers two advantages. First, it provides a description of ecological change abstracted from the study of an array of systems, an array more diverse than those traditionally entertained in more established disciplines. There are

grounds to suggest its formulation will share more of the virtues and fewer of the defects of constructs of ecological change offered by established disciplines in isolation. Given the description's empirical depth and breadth, it will be a useful device for unearthing the patterns of ecological change this study contends are embedded in Innis' histories. Second, the description will provide a useful measure for determining the extent of Innis' knowledge about the dynamics of ecological change. As we shall see, Innis knew a great deal. There is a remarkable coherence between the descriptions in his histories and the writings of philosophers and scientists interested in *complex adaptive systems*. To inform our reading, we will again rely on the writings of Alicia Juarrero, as well as John Holland, a pioneer in the science of complexity, and James Gleick and Mitchell Waldrop, writers who have written popular treatments of the research currently being undertaken in this new and expanding field of science.

I

The first conception of change -- which Innis attempted to transcend -- was derived from 17th century physics, and specifically the celestial mechanics of Sir Isaac Newton. Newton envisaged a universe housed in three-dimensional Euclidean space. Space and time were viewed as separate dimensions, and each was viewed as an independent, neutral medium. Neither dimension was constituted by the objects within them. Both were viewed as being logically prior to them.²⁹

All objects in space were seen to be governed by an independent, homogeneous set of laws. No provision was made for separate layers of organisation governed by distinct sets of laws, as would pertain today, for example in physics, where the movements of planetary bodies are described by celestial mechanics, while the movements of subatomic particles are described by quantum mechanics. After Newton demonstrated that gravitation is susceptible to mathematical expression, and that his formulae described the movement of both terrestrial and celestial objects, scholars in the sciences and philosophy embraced his vision of a cosmos governed by universal laws that operate independent of time.³⁰

It was a vision that privileged Aristotle's concept of efficient cause at the expense of formal, final and material variants of causation. Efficient cause was identified with external forces acting on inert objects. One example was gravity, a force that determined the positions of bodies in space. Newton's view of matter was atomistic. Matter was in essence immutable, subject only to the push-pull of forces from the outside. The implication of that position was to consign purpose - - final cause -- to the wind. It also determined which attributes of matter were to be labelled primary, or important, and secondary, or trivial. Attributes that were associated with the internal properties of the object -- such as mass -- and not subject to context were labelled the "real" -- or primary -- qualities of matter. Those properties that were dependent on context, that were seen as a function of its relations with other objects such as colour and temperature, were seen as secondary. Since the internal properties of matter were held to be constant

regardless of context, wholes were deemed to be qualitatively indistinguishable from their parts. Indeed, the very existence of aggregates was seen to derive from efficient cause. They were considered an epiphenomenon. There was no appeal to self-organisation, no sense that a system might emerge and appropriate a part to either generate or retain its formal integrity. With nothing to qualitatively distinguish building blocks from their aggregates, formal cause was also removed from the explanatory framework of the sciences and modern philosophy.³¹

The consequent of a formulation based on efficient cause and immutability of matter was twofold. First, time ceased to have directionality or meaning. Since the essential nature of every system was identified with its governing rules, and those rules never changed, there was nothing of importance to distinguish Time A from Time B. The only way to distinguish temporal events was to track the changing position of objects within a system, positions that were determined by its covering laws. Since all systems were by definition closed, there was no variable, such as a change in the system's content, or an unexpected intrusion by the outside environment, to prevent an observer from predicting or retrodicting distinctions in the system's state, past or present.³² By virtue of this construct, time became a secondary category. As Floyd Merrell notes:

Matter thus became indifferent to the lapse of time, and time became a mere accident, a succession of instants totally independent of material attributes. Hence this quantitative and qualitative immutability of matter was counterpart to the homogeneous, but unrelated flow of time.³³

The second consequent of Newton's formulation is that it erased any possibility of accounting for human agency. By divorcing celestial mechanics from time, Newton undercut any basis for asserting that time was unidirectional. If one were to film the orbit of Saturn for two millennia, and then play it backward, the formula a physicist would use to describe its trajectory would be the same. Purposive behaviour, by contrast, is not as easily detached from a directional sense of time. As Alicia Juarrero notes:

Newton's heirs dealt the final blow to Aristotle's concept of final cause by dismissing as illusory the apparent unidirectionality displayed both in the development of organic forms and by the aimed-for goal-directedness of voluntary, intentional behaviour. In doing so, the one-way reaching out of *orexis* (from soul to world), which accounted for the purposiveness of action, became a problem in need of an explanation, as did the vector-like quality of action itself. If real things (atomic particles), were unaffected by time and context, an object's interactions with its environment and the unique trajectory it traced through time and space also became secondary, "accidental" properties of no account to what really makes a thing the kind of thing it is and no other. . . .³⁴

II

In contrast to the closed systems described by Newtonian mechanics, *complex adaptive systems (cas)* are characterised as environments produced by virtue of the interactions of agents within the system. Whereas Newtonian mechanics assumed a universal covering law which determined the movement

and relationship between its constituents in perpetuity, the relationship between components in *cas* do not remain fixed. There is no Clockmaker. Control is highly dispersed among the system's agents. If the system demonstrates any coherence, it is a result of the competition and cooperation of the actors involved. *Cas* are ubiquitous in nature. The economy is a *cas*. Its agents are individuals, participant corporations and states. The brain too is a *cas*, with individual neurons acting as agents.³⁵

An important by-product of systems with agents acting in parallel is that they display emergent properties. Previously uncorrelated particles -- aggregates -- undergo a *bifurcation* (also called a *phase transition*), in which they interconnect and form an orderly arrangement, a system. The difference between an aggregate and a system is akin to the difference between a sand pile and an ant colony. Aside from number and spatial proximity, there is nothing to distinguish the properties of a sand pile from an individual grain of sand. In *complex adaptive systems* by contrast, the whole is more than the sum of its parts. An ant colony, for example, can display a range of behaviour that an ant in isolation cannot. As the number of ants, and the number of interactions between ants, increases, the repertoire of skills, or behavioural competence, of the colony also increases.³⁶

Complex adaptive systems are also characterised by patterns that persist through time, or display *differential persistence*. The system's identity rests on the emergent pattern, not the identity of its constituent agents. The human body, for example, is a complex system. Its constituent agents -- human cells -- are

routinely replaced -- and yet the pattern defining the individual remains. A standing wave is a second example of *differential persistence*. The pattern remains despite the continuous turnover of water molecules.³⁷

Since adaptation is a continuous process, *complex adaptive systems* can also display multiple levels of organisation. In such a circumstance, a system at one level of organisation will fill the role of agent in the next. Cells, for example, recombine with other cells to form an organ. Organs combine to form an organism.³⁸ And as Alicia Juarrero notes, each sequence of a self-organising system is distinguished by increasing complexity, and “a progressive differentiation into a highly articulated, multilevel hierarchy in which new, functionally defined individuals or components emerge.”

A system emerges when previously uncorrelated particles or sequences or processes suddenly become coordinated and interconnected. In subsequent steps of an evolutionary sequence, components and processes are correlated and interconnected differently -- in an even more complexly differentiated hierarchy. What makes each step of a self-organised process new is that its components are systematically interrelated in qualitatively novel ways. . . .³⁹

Since each step of self-organisation is precipitated by a contingent event, *cas* have their own unique history. They become individuated over time as the complexity of each level of organisation, and the number of levels of organisation, increase.⁴⁰ The historical context of the system is important not only for explaining emergence, but also the function of its constituents. Multifunctionality in biological systems provides one example. A set of three bones

used to provide a flexible linkage in the gill arch of a fish later had different applications in a reptile's jaw and the inner ear of a mammal.⁴¹

The history of *cas* cannot be described by the linear equations employed in Newtonian mechanics. Rather, as John Holland explains, while the interactions in at least some *cas* can be described in terms of invariant laws, the trajectory of the system is subject to constant change, and is more susceptible to the narrative mode of explanation employed by historians: "The definition of the generated system, although it determines all the rest, is no more than a simply described starting point; subsequent activities can be determined only by extended examination and experiment."⁴²

Cas are also distinguished insofar as they are systems out of equilibrium. Contrary to expectations associated with Newtonian mechanics, which identified non-equilibrium as a disruption of a system's order, research by Ilya Prigogine, Stuart Kauffman, Chris Langton and others suggest that non-equilibrium is a *source* of order, albeit a non-linear one. A linear process is akin to a machine. You move a lever, the machine moves. You change the input of a system governed by a linear function, the system changes as you adjust the input. Matters are not as straightforward in non-linear systems. One can change the value of the *control parameter* -- the input -- for a period of time and observe no discernible change in the system's behaviour. As the input continues, however, the system will suddenly reach a bifurcation point, a point where the system self-organises into a coherent structure, commonly referred to as a dissipative structure. Dissipative structures can be seen as an evolutionary adaptation. By

virtue of their formation, they dissipate the non-equilibrium that has built up in the system, and are consequently better adapted to the new conditions set by the *control parameter*.⁴³

The Benard cell is a classic example of a dissipative structure. To start, imagine a pan of water at room temperature. It is at equilibrium. The water's temperature is the same regardless of where it is measured within the pan. Once heat is applied, however, the scenario changes. As the *control parameter* rises the system initially attempts to maintain equilibrium -- a mean temperature -- through negative feedback. The system attempts to prevent the emergence of a temperature gradient through the use of conduction.

As the temperature continues rising, the system shifts further away from equilibrium, to a point where maintenance of a thermal mean is no longer a viable mode of organisation. At that juncture, the system shifts from a static to a dynamic form of organisation. Instead of suppressing thermal fluctuations around a mean temperature, the system begins to reinforce them through positive feedback, leading to the emergence of a convection current, or Benard cell.

Anyone who has poured cream into coffee will recognise the Benard cell's hexagonal pattern. Water molecules in a glass of water behave in an uncorrelated fashion. They demonstrate spatial symmetry. Water molecules in a swirling cup of coffee, by contrast, organise themselves into macroscopic patterns. They behave in a correlated fashion.⁴⁴ When Benard cells emerge, non-equilibrium is reduced as the "complicatedness of millions of independent molecules of water bouncing helter-skelter into each other" are streamlined "into the complexly

organised, macroscopic, dynamic process structure of a Benard cell,” thereby facilitating the dissipation of the critical gradient that had built up.⁴⁵

This strategy should be familiar to anyone who has taken a bath and discovered the water in the tub is too hot just as they are about to begin. Filling the tub with cool water is only a partial solution, since one half of the tub will subsequently contain water that is too cold, while the remaining half will remain too hot. The entry of the cool water into the tub, however, does introduce non-equilibrium into the system. There is now a temperature gradient. Non-equilibrium is reduced -- the water is reduced to a liveable temperature -- by artificially introducing a convection current. The bather stirs the water in a circular fashion before plunging in.

While the emergence of macroscopic structures is a common feature of *cas*, a second common characteristic is that they appear only in association with a finite range of values for the *control parameter*. Stuart Kauffman’s work with genetic circuits serves as a notable example. In the early 1960s, Kauffman came across Francois Jacob’s and Jacques Monod’s path-breaking research into genetic circuitry. In their papers, the two demonstrated that the cell contains a number of regulatory genes that routinely activate and deactivate one another. In essence, they are switches in a biochemical computer.

As a basis of orderly behaviour, genetic circuits seemed the likely basis of cell differentiation, the reason why one cell becomes a brain cell and another a liver cell. Kauffman’s innovation was to suggest the cell’s computer did not carry out its instructions in a linear fashion, as an IBM mainframe would, but rather in

parallel. The process was not one in which Gene A would activate Gene B, leading in turn to the activation of Gene C, and so on.⁴⁶

Instead, Kauffman argued that since more than one regulatory gene was likely to be active at any time, cells were likely to be differentiated by self-consistent, self-organised sets of active genes. While Kauffman was able to construct computer models that supported his contention that regulatory genes formed self-organising networks, he also discovered that emergence only occurred within certain constraints. The *control parameter* in this case was the number of connections between genes. If there were too few, most of the switches settled into a pattern of simultaneously switching on and off. If the switches had been light bulbs, the effect would have been akin to a strobe light. The effect was also analogous to the equilibrium of a pot of water at room temperature.

By contrast, when too many connections were added, the sequence of switches continued firing, never settling into a stable pattern, like an array of lights in which members switch on and off in a random fashion. In such a scenario, the effect was similar to turning up the heat beyond the point where the pot's water moved beyond the relative stability of convection currents to the turbulence of boiling. Only when Kauffman limited the number of connections to two did his genetic networks begin to display emergent behaviour.⁴⁷

Mitchell Waldrop notes that the above pattern -- stasis, bifurcation, turbulence -- is a pattern that researchers have noted in a variety of complex systems.⁴⁸ Chris Langton, for example, found a similar "edge of chaos" pattern in

cellular automata, a mathematical construct used to model physical and chemical processes, and one which Langton used to explore how life might have emerged in the distant past. A part of the answer, Langton suggests, may rest in a balance between order and disorder. As Waldrop notes:

More precisely, he's [Langton] saying that you should look at systems in terms of how they behave instead of how they're made. And when you do, he says, then what you find are the two extremes of *order* and *chaos*. It's a lot like the difference between solids, where the atoms are locked into place, and fluids, where the atoms tumble over one another at random. But right in between the two extremes . . . at a kind of abstract phase transition called "the edge of chaos," you also find *complexity*: a class of behaviour in which the components of the system never quite lock into place, yet never quite dissolve into turbulence, either.⁴⁹

By virtue of their ability to maintain a peculiar tension between order and chaos -- to adapt -- *complex adaptive systems* also display a resiliency which stable systems cannot match. While stable systems display the same flexibility in organising subsystems as *cas*, they generally are unable to withstand the introduction of heterogeneous elements, or fluctuations in their environment. The Great Lakes is a stable eco-system, but many of its indigenous fish stocks were unable to withstand the entry of the lamprey into their immediate environment. Resilient systems, as Alicia Juarrero notes, are able to absorb changes and still maintain their integrity:

Resilient systems are able to modify their specific structure so as to ensure the adaptability and

survival of their overall organisation. . . .Complex systems are usually more resilient than simple ones, with complex open systems that interact with their environment exhibiting the highest degree of resilience.⁵⁰

Finally, *complex adaptive systems* are distinguished because they are governed by formal and final cause. Stated another way, *cas* seek to maintain their integrity and do so through regulating the behaviour of their subsystems, and interacting with their environment in a way that can be construed as purposive.

Autocatalytic sets provide a straightforward example of the role played by formal cause. They are a second construct of Stuart Kauffman, who used them to explore the conditions surrounding the origin of life. Kauffman's interest in the topic was prompted in the late 1960s by his dissatisfaction with the then prevailing view held by biologists. While Harold Urey and Stanley Miller had demonstrated how simple molecular building blocks of life might have emerged spontaneously, through the interaction of lightning with the constituent gases of earth's early atmosphere, no biologist had taken the next step, and demonstrated how amino acids and sugars might have combined to produce an organism. Most assumed DNA was the product of random chance, a fortuitous combination of chemicals in a primitive pond.

Kauffman chose to challenge the assumed process -- random combination -- and the assumed requisite outcome -- the formation of DNA. In his eyes, the mathematical odds of producing even a simple protein through random chance were prohibitive, requiring a period of time larger than the age of the universe.

He also resisted the notion that life was dependent on a complicated mechanism such as DNA. He set out to find a way in which a self-replicating system might have started, one which would have served as a building block for life, and have emerged from simple chemical reactions.⁵¹

Kauffman's line of reasoning was as follows. In the primitive pond alluded to above it is likely that some random reactions took place between amino acids and sugars, thereby producing molecules with short chains and branches capable of further linkage with other molecules. Some of these molecules operated as catalysts, molecules that promote the combination of other molecules, and their transformation through chemical reaction into different molecules. Catalysts facilitate chemical reactions between molecules at a rate far more rapid than would transpire with the constituent molecules in isolation. Kauffman envisioned a situation in which a molecule A would serve as a catalyst leading to the formation of molecule B. Molecule B in turn would have a catalytic effect on the production of molecule C. If enough molecules were located in the primeval pond, the process would continue until a molecule Z catalyzed the creation of A, thereby closing the loop of interactions between constituent molecules.

At such a juncture, the system begins to display life-like properties. It grows, incorporating molecules from outside the system. It has something akin to a metabolism, outside molecules are taken in and transformed into molecules useful to the set. The central point is that once the system attains closure it ceases to be a passive conduit for energy and materials from the environment. Rather

components from the outside are *selected* based on their capacity to contribute to the integrity of the whole.⁵²

The system also assumes a regulatory role over its constituent processes, akin to an organism's physiology. It regulates the rate of its constituent chemical reactions to ensure the continued existence of the set by controlling the intake of requisite materials and energy. By virtue of its capacity to select, an autocatalytic set is more accurately described as a product of formal cause. It is not the passive recipient of matter and energy, a scenario consistent with efficient cause. It rather selects from the environment what it needs to maintain the integrity of the set: formal cause.⁵³

The role of final cause -- or purpose -- can be demonstrated on two levels. The first is that the behaviour of autocatalytic sets in particular and *cas* in general are asymmetrical, tending towards the "goal" of greater organisational complexity and greater competence in the face of threats from the environment. On a second level, *cas* possess a capacity akin to the competence humans display when they employ mental schema, the capacity to model the world, thereby facilitating prediction of future consequences based on a specified action.⁵⁴

The schema are not passive. They activate when a *cas* confronts the situation specified by the schema. They are subject to testing, refinement, and rearrangement as the system gains experience. According to John Holland, the capacities of organisations to predict and model are qualities that predate the existence of the brain as an organ and the later emergence of consciousness. Few

would construe bacteria as an entity with consciousness, and yet their behaviour reveals a model with suppositions about their surrounding world.

Bacteria contain enzyme systems that lead them to swim towards stronger concentrations of glucose. The presence of the enzymes suggest two important suppositions about the immediate environment: one, that chemicals diffuse away from their source; and two, that the further chemicals travel, the more their concentration declines. The two observations are sufficient to form a prediction. If a bacterium follows the gradient in the direction of higher concentration, it will locate food.⁵⁵

In *complex adaptive systems*, formal and final cause can be identified with each other, since both refer to the system's role as an active agent, one that exploits matter and energy from its environment in order to maintain its formal integrity. The system, by regulating the behaviour of its constituent parts to maintain its existence, demonstrates the purpose associated with final cause, and the distributed whole associated with formal cause. The same system reveals the governance of a distributed whole when it interacts with the environment, by replacing constituents, and adding new ones to heighten its behavioural competence. And in so doing, it simultaneously reveals the presence of a final cause, through its use of a schema or model of the environment to differentiate the fitness of one constituent over another in meeting the system's needs.⁵⁶

III

As an instrument for interpreting Innis, then, the theory of *complex adaptive systems* points to six distinct properties for us to look for in our reading of Innis. It emphasises the need to look for systems comprised of agents. It further emphasises the need to observe systems that display emergent properties, properties obtained by the interactions of agents with each other, and with their surrounding environment. Third, the theory suggests such systems emerge only when a proper balance between order and constraint has been obtained, an "edge of chaos" state reached through the input of a *control parameter*. Fourth, it suggests we look for patterns that display *differential persistence*, products of interactions between agents that are used in a variety of contexts. Fifth, the theory points to the importance of formal cause, the presence of a distributed whole that regulates the actions and internal organisations of its constituent agents. Finally, *complex adaptive systems* are characterised by final cause, the purposive interaction of systems with their surrounding environment to maintain their integrity, interactions that are guided by schema.

With reasonably detailed descriptions of both variants of change in hand, it should be noted in closing that there are grounds for this study's suggestion that Innis favoured ecological over mechanical constructs of change in his writings. This claim rests on the realisation that most if not all the features associated with *complex adaptive systems* have been identified in the Innis literature as significant constituents of his thought. Paul Heyer, for example, has highlighted the importance of interacting agents and the consequent formation of pattern in his

reading of Innis: "Interplay, formation, and interaction are terms that can be used to describe his view of the historical process."⁵⁷ Judith Stamps has also emphasised a reading of Innis in which interacting agents and contingency figure large, a vision of history describing a "fluid world beyond the strictures of dualism, a world in whose light one could see history as a process that was simultaneously integrated and decentered."⁵⁸

Several interpreters have noted the importance of disequilibrium in Innis' constructs of change, particularly those in his economic studies.⁵⁹ Others have noted a corresponding stress by Innis on the importance of balance, or the maintenance of centralisation and decentralisation, order and flux, as the necessary prerequisite to adaptation and change. The idea is similar to the "edge of chaos" requirement we noted above.⁶⁰ Innis commentators have also noted the importance of persistent patterns, or *differential persistence*, in his histories, Abraham Rotstein for example noting that "one of Innis' major propositions, which he asserted often, was the institutional continuity of Canadian economic history." Ian Parker and Ian Angus see similar propositions in Innis' communication studies, particularly in his discussions of persistent mental constructs that governed the worldviews of ancient societies.⁶¹ Marshall McLuhan and Graeme Patterson have both emphasised the importance of formal cause in Innis' writings, while Robin Neill has suggested that final cause is a defining feature of Innis' economics.⁶² Michael Gauvreau has made a similar observation, noting the importance of human purpose in Innis' first major study of a staples industry, *The Fur Trade*: "Human psychology and ability to organize,

not the overwhelming influence of Canada's harsh geography or human behavior, dominated *The Fur Trade in Canada*. There was, Innis asserted, a dynamic relationship between geography and human ingenuity."⁶³

The challenge presently facing the Innis literature, therefore, is not the identification of the constituent features of his thought, but rather the demonstration that these constituents were part of a larger framework of change that was understood by Innis. Ian Parker has distinguished himself in the literature through his attempts to reconstruct Innis' framework of change, but his readings have not provided a comprehensive account of Innis' construct, nor have they been based upon sustained references to Innis' works. The fact that we have not received such a comprehensive reading from Parker is a loss, for he has consistently shown himself to be one of Innis' most sensitive interpreters. As we saw in our introductory chapter, it is Parker who counsels us to remember that "notwithstanding some passages that appear to summarize aspects of his theoretical position, most of his analytical framework is only available in *implicit* form and can only be extracted and rendered *explicit* through an extended inductive process involving a period of intensive absorption in his work."⁶⁴ It is a method that we will apply here as we begin our reading of Innis' major works, *The Fur Trade*, *The Cod Fisheries*, *Political Economy in the Modern State*, *Empire and Communications*, and *The Bias of Communication*. Through it all we shall see an extended commitment by Innis to demonstrate that human systems, be they economic or cultural, are governed by a regime of change defined by emergent properties, *differential persistence*, and formal and final cause.

Chapter Two: *The Fur Trade*

Harold Innis' economic histories are in major need of re-appraisal, for reasons stemming as much from the development of historical traditions outside of Canada as those within it. In the United States, Britain and other countries adjoining the Atlantic, there is a growing movement amongst scholars, particularly those studying the 18th century, to recast national narratives as part of a much larger history, that of the North Atlantic Basin. In the line of reasoning offered by the movement's proponents, the North Atlantic by the 18th century had emerged into a coherent whole due to the substantial political, cultural and commercial ties joining both sides of the Atlantic. It is further asserted that these networks almost certainly had a bearing on the internal political, social, and economic development of its participants. Stated simply, proponents of the "New British History" in the United Kingdom and "Atlantic History" in the U.S. argue that to properly understand events that transpired within, one must relate them to historic trends that transpired without.⁶⁵

Canadian historians should welcome these developments, if only because they reinforce lines of inquiry present in the Canadian literature for over half a century. The importance of the North Atlantic triangle has been a defining characteristic of Canadian historiography since the 1930s, as witnessed by the writings of Arthur Lower, John Bartlet Brebner, and of course Harold Innis.⁶⁶ There is every reason to expect that Canada, by virtue of its history and geography, will be an important contributor to the international effort to create a

historiography of the North Atlantic Basin. But before doing so, Canadian scholars would do well to reconsider the significance of contributions already in hand, particularly those written by Harold Innis.

Here the central problem facing Canadian scholars is that while there is a rich literature devoted to the interpretation of Innis, there is little consensus within it on the exact nature of his contribution to Canadian letters, empirically or conceptually. In a recent historiographical essay, William Buxton and Charles Acland noted that within Canada there is respect for Innis as an "eminent scholar," but "also some degree of bewilderment about his actual contribution." Interpreters have reached a "consensus that he initiated something important," but there remains "some confusion about how Innis' legacy can be best appropriated." Due to continued disagreement in the literature, and the opaque nature of Innis' prose, the two note that contemporary expressions of high regard are becoming increasingly qualified, offered with "the same enthusiasm as an obligation to visit a relative one doesn't really like."⁶⁷ In short, the current portraits of Innis are diffuse, ambivalent, and in their totality do not constitute a strong endorsement of Innis' work in the field of Atlantic historiography, or any other historiography for that matter. Canadian historians face a quandary. If we are to recommend Innis to our colleagues abroad, on what basis do we recommend him?

The purpose of this chapter is to suggest that much of the esteem Canadian scholars initially awarded Innis' work can be retrieved if a sharper understanding of Innis' construction of change is gained. In this chapter and the next, we will argue that Innis' work can be commended as pioneering work not only from the

standpoint of method -- the interpolation of Canadian with Atlantic history -- but also from the standpoint of interpretation. Innis was a pioneer, because he interpreted Canada as an economic system that displayed emergent properties, differential persistence, and was governed by formal and final cause. It is a view that is finding favour among current proponents of Atlantic history.⁶⁸

Such a reading has the potential not only to clarify Canada's contribution to Atlantic historiography, but also a perennial question in the Innis literature: How did Innis characterise the international economy that governed Canada's development? In the literature devoted to Innis' studies of staple industries, there have been three fault lines that traditionally have divided scholars, two empirical and centring on the process of growth within Canada, one conceptual and centring on the nature of the economy outside Canada. The first division centres on the adequacy of Innis' interpretation of individual staple industries, particularly the fur trade.⁶⁹ The second division refers to Innis' characterisation of Canadian economic development. Several scholars have charged that Innis' focus on extractive industries was too narrow, and that in focusing on one economic sector he missed essential features of the economy that were also responsible for promoting economic growth.⁷⁰

While this study cannot make a contribution to the first two points of contention, it can make a contribution toward the third, namely Innis' characterisation of the international economy. In 1963, Mel Watkins published the "Staple Theory of Growth," the now classic proposition that staple-producing countries are governed by a normative theory of growth that distinguishes them

from their counterparts, since their economic growth is stimulated by the export of primary products. The problem with this scenario, argued Watkins, was that staple products had historically proven to be a poor mechanism for generating the "spread effects" -- the economic spin-offs -- required for the emergence of a diversified economy. Without the requisite transport infrastructure, processing industries capable of adding value to staple exports, or manufacturing industries to provide consumer goods to workers in the primary sector, Canada was unable to transform itself into a diversified economy, which in this formulation meant an economy with a substantial manufacturing base.

Because of the weak spread effects associated with commodity exports, Canada and other countries fell into what Watkins referred to as the "Staple Trap," engendered in part by perpetual debt, and in part by the designs of its respective Imperial centres. Watkins, and other proponents of the new Canadian Political Economy in the 1970s and 1980s, complained that commodity extraction placed Canadian producers in a perpetual state of dependence on foreign capital markets. Profits were continuously used to retire debts acquired from building transport infrastructure, a perpetual need in a staple economy. Canadian firms were never able to divert capital toward the construction of an industrial base. It was locked into the role of staple producers, and its specialisation was not due to the governance of abstract market forces. Instead, Canada was assigned its role by its respective imperial centres, which determined the location of investment, international monetary policy, and rules of individual trade. Watkin's plaint was a nationalist plaint. The organisation of Canada's economy was not a result of the

designs of its inhabitants. It was a result of decisions made in Britain and the United States.⁷¹

In making his formulation, Watkins claimed inspiration from Innis, and that is where the controversy arose. Critics charged that Innis' narratives could not be translated into a normative theory of development.⁷² Other interpreters thought Watkins' theory had so oversimplified Innis' writings -- omitting factors such as culture -- that it bore no relationship to the original.⁷³ Historians charged that the contention by Watkins and other proponents of Dependency theory -- that the Canadian periphery had enjoyed no agency in its relationships with its respective Imperial centres -- found support neither in the historical record, nor in Innis' histories. The relationship was more properly characterised by appeals to organic or ecological metaphors, in other words by interaction, not domination.⁷⁴

Still, for all the criticism, some interpreters continue to identify Innis' writings with the tenets outlined by Watkins. In a 1981 article James Carey argued that Innis moved beyond "the organic metaphors that so often led the Chicago scholars [of the Chicago School of Communication] astray and masked the facts of history Even if society were like an organism, there would be some controlling element, some centralised brain in the body, some region and group that would collect the power necessary to direct the nerves of communication and the arteries of transportation." Marc Egnal has recently criticised the staple hypothesis for its neglect of "the impact of culture and long-lived institutions on growth," and its "odd static quality."⁷⁵

The disparate nature of the literature, therefore, suggests the need to ask the following questions of Innis in our reading of *The Fur Trade* and *The Cod Fisheries*. Did Innis ascribe agency to Canada and other peripheral agents operating outside the imperial centre? In other words, was the relationship one of dependence, or interdependence? Did he see the imperial centre as a unified agent, or was the picture more complex? Did he see the economic specialisation of his subjects -- including imperial centres -- as solely the product of design, or also the product of market forces? And finally, did Innis see Canada's outcome as pre-ordained by virtue of its status as a colony, or a historically contingent outcome?

These are questions that we shall address in detail at the conclusion of the following chapter, largely because a reading of *The Fur Trade* in isolation will not allow us to answer them. While *The Fur Trade* is devoted primarily to the development of Canada's economy, it has comparatively little to say about the historic constitution and capabilities of Imperial economies, be they that of Britain, France or Spain. As well, while *The Cod Fisheries* is primarily devoted to the evolution of the North Atlantic economy, Innis said important things about the regime of change governing the evolution of the Canadian economy in that work that were not addressed in *The Fur Trade*. In short, to determine if Innis was a proponent of a normative theory of economic development, or by contrast was an advocate of a theory appealing to historic contingency, we shall need to engage in a sustained reading of both studies before answering the above questions.

Before beginning our reading of *The Fur Trade*, however, we will begin this chapter by exploring the intellectual agenda Innis set for himself at the start of his career, as outlined in his writings on Thorstein Veblen, and his history of the Canadian Pacific Railway. The issue is important because it suggests that even at the start of his career Innis was appealing to a construct of change that differed in almost every respect from that offered by Watkins. Then we shall turn to a reading of *The Fur Trade: An Introduction to Canadian Economic History*. As we shall see, Innis' vision of economic change was based not on normative theories of growth but rather on the importance of contingency. More importantly, it was a vision that embraced the importance of emergent change, and the governance of formal and final cause.

II

When examining existing treatments of Innis' career, it is not unusual to find surveys that begin with a summary of his first publication, *A History of the Canadian Pacific Railway*, an adaptation of his PhD thesis which was first published in 1923. While reference to a first work in any chronological treatment is understandable, in the case of Innis it is something of a disservice to use it as a point of departure. Conceptually, it was not a rich work. Innis laid out no programmatic statement, either for himself, nor for the discipline of economics. Instead, the work limited itself to a specific objective, namely a description of the history of the CPR "from an evolutionary and scientific point of view."⁷⁶

Unfortunately, Innis never justified his reasons for appealing to evolutionary history. He did not explain how the framework would enhance Canadians' understanding of their economic past. Nor did he state its significance for him as a practising economist. In short, Innis never made plain the underlying rationale for the construction of his study.

A better frame of departure is to start with Innis' 1929 defence of the writings of Thorstein Veblen, the controversial American political economist whose writings Innis was exposed to as a graduate student at the University of Chicago.⁷⁷ In "The Work of Thorstein Veblen" Innis came as close as he ever would to writing a programmatic essay. In it, he outlined the crucial problems facing the discipline of economics as he understood them, stated his theoretical preferences, and outlined the program of work that he believed young economists such as himself should pursue.

His purpose was also to restore the reputation of a man he believed to be "the most important economist to come out of America."⁷⁸ Innis argued that Veblen had been unfairly categorised as a "satirist with barbed phrases" in the wake of scholarly and public exposure to his *Theory of the Leisure Class*. True, he had skewered American spending habits with phrases such as "conspicuous consumption," but his significance as an economist rested on the far more positive contributions he had made as an economic theorist.⁷⁹ Innis was drawn to Veblen because of a commonality he shared with Adam Smith, namely "his attention to current events and his interests in dynamics."⁸⁰

Concurrently, he had waged an "onslaught on static economics," the supposition that economic systems were characterised by stability.⁸¹ The standard economic doctrine of the time -- typified by the writings of Alfred Marshall and others -- argued that perturbations in economic systems were not seeds of growth. Rather, they were anomalies to be corrected by negative feedback processes. Once these mechanisms had completed their work, the system was restored to its original harmony.⁸² The problem with such assumptions, Veblen complained, was that they could not account for institutional growth and decay. Economics became little more than the practice of taxonomy, the classification of static forms.

By contrast, Veblen pressed for an economics that addressed questions routinely faced by the biological sciences, namely the problems of emergent form and systemic change. According to Innis: "Veblen attempted the study of the embryology, morphology, physiology, ecology, and aetiology of economics."⁸³ His method of modelling the dynamics of economic systems, according to Innis, was the study of time series of price data, and the relation of that data with "the state of the industrial arts -- on the introduction of railroads, the ocean steamship, and agricultural machinery." Veblen's study of the dynamics of the wheat market and business cycles, Innis argued, emerged as "models for the work of later economists in analysing the relationship of complex factors."⁸⁴ As we shall see, Veblen's method was one that Innis would adopt himself, particularly in his studies of media and communication.

Innis was also drawn to Veblen's work because of his insistence that human purpose was an important constituent of economic change. One of Veblen's most important contributions in *The Theory of the Leisure Class* had been his attack on marginal utility theory, the belief that a commodity's value derived solely from objective factors such as its relative scarcity. Veblen maintained that subjective factors, such as the desire for social status, also played a determining role in the adjudication of value.⁸⁵ Aside from the question of value, the issue of human purpose was important because it had a direct bearing on the form of change that one could justifiably posit as governing society. To insist on the importance of the individual was to admit the presence of the contingent event, and consequently the need for a dynamic form of change. For Innis, *The Theory of the Leisure Class* emerged as "a clash between the viewpoint of the German historical school with its stress on the evolution of institutions and the classic theory."⁸⁶

Innis was further drawn to Veblen's assertion that schema played a role not only in effecting economic change, but also in affecting the economist's ability to analyse it. Veblen was conspicuous in his attempts "to maintain an unbiased approach." His interest in anthropology and his wit protected Veblen "from absorption into the partialities of modern movements. His anxiety has always been to detect trends and to escape their effects." At base, Veblen wrote, it was important in the analysis of institutions to "resort to words and concepts that express the thoughts of the men whose habits of thought constitute the institution in question".⁸⁷

Nowhere had this insight proven more important than in the discipline of economics, where Veblen suggested that the structure of historic economic environments had had a direct effect on the preconceptions analysts brought to bear in analysing them. Such had proven to be the case in the early 19th century, in the economics produced in conjunction with the handicraft system. Such had also been the case in the industrial era. In reviews and articles, Veblen "traced the effects of industrialism on economic theory" ⁸⁸ In sum, Veblen's stress on the importance of human purpose in economics rested on his "emphasis on the importance of the scientific point of view" ⁸⁹

In Innis' estimation, the force of Veblen's ideas had been such that "the most virile of the younger economists have been strongly influenced by his work." ⁹⁰ It was a group whose ranks Innis plainly aspired to join, not only by promoting Veblen's work, but also by forwarding a research agenda that drew inspiration from Veblen. His work was significant, Innis argued, because of its "unbiased approach to economics" and its "research into the current problems of the industrial revolution." ⁹¹ In making his analyses, Veblen had refused to surrender to stereotypical thinking, and in so doing had identified the chief handicap compromising economic theory:

In the perennial struggle between standardization and dynamic growth, between static theory and dynamic history, between Frankenstein's monster and Frankenstein, between mechanization and the instinct of workmanship, Veblen has waged a constructive warfare of emancipation against the tendency toward standardized static economics which becomes so dangerous on a continent with

ever increasing numbers of students clamouring for textbooks on final economic theory.⁹²

Innis believed it important for economists to continue Veblen's efforts to achieve "a closer synthesis between economic history and economic theory", and to do so in two specific ways. First, he pressed economic historians to continue their inquiries into the conditions underlying the origin and growth of institutions, such as those undertaken by George Unwin, Charles Fay, and Norman S. B. Gras. Second, he urged his colleagues to build on Veblen's efforts to "outline the economics of dynamic change," and particularly one subset of that dynamic, the theory of cyclonics. Veblen's work was distinguished by its realization that the characteristics of economic change in newly developing countries were different from their more highly industrialised counterparts. According to Innis, Veblen's insight into the cyclonics -- as opposed to the general dynamics -- of economic change was a result of his personal experience living in the U.S., where he "actually lived through one of the economic storms of new countries."⁹³ While the characteristics of new and developed countries differed, Innis believed their attributes could be partly or completely harmonised under a single framework.⁹⁴ But such unification would only occur if the economics of developing countries were subjected to future study:

The conflict between the economics of a long and highly industrialized country such as England and the economics of the recently industrialized new and borrowing countries will become less severe as the study of cyclonics is worked out and incorporated in a general survey of the effects of the industrial revolution such as Veblen has begun and

such as will be worked out and revised by later students.⁹⁵

As we shall see, Innis' purpose was to bring his work into alignment with the priorities set by Veblen. Throughout his career, in studies devoted to Canada's economic history and the history of communication technology, Innis would draw attention to the importance of dynamic change and human purpose in the unfolding of the historical process. Indeed, Innis' preface to *A History of the Canadian Pacific Railway*, in which he announced his ambition "to trace the history of the Canadian Pacific Railway from an evolutionary and scientific point of view," suggests he attempted to fulfill both objectives in his first published work.

In 1930, however, Innis in *The Fur Trade* indicated his belief that he had failed, due to his sense of the "incompleteness of that volume."⁹⁶ If we are to understand Innis' verdict, it is important to get a better sense of the obligations he assumed for himself when he undertook to study Canada's past from an evolutionary perspective. The question is worth pursuing, because it suggests that Innis from his earliest writings was striving to create economic models governed by a different form of causation, namely formal cause. It is also worth pursuing because it suggests Innis by 1923 had formulated, or nearly formulated, the research agenda that would preoccupy him for the next 17 years. Most if not all of Innis' staple studies are anticipated in the conclusion of his first study, and all can be characterised as attempts to redress the shortcomings of that study.

To begin, consider Darwin's theory of natural selection. In the history of biology, Darwin's theory forever changed the discipline because it undermined the idea that natural kinds are eternal, primarily by providing a mechanism to explain the evolution of animate forms, or species, over time. In the history of any ecosystem, Darwin argued, certain species survived because they demonstrated a degree of "fitness" that distinguished them from their competitors. Stated another way, some organisms historically had proven more successful in extracting needed resources from the environment. Their less fit counterparts, by contrast, generally passed into extinction. Since the characteristics of a given ecological system determined the success of one species over another, fitness was construed not as a primary property of the organism, but rather as a secondary property, a product of its interaction with the environment. In Darwin's theory, the ecosystem emerged as the agent of selection.⁹⁷

He further argued that a given species, by virtue of its selection by the environment, enters into a systemic relationship with its surrounding niche. The relationship enables selected organisms to survive and reproduce, but it also determines the future characteristics that the species will exhibit. An organism is distinguished from its counterparts by its interaction with its environment. Two animals of the same genotype, or genetic makeup, can display different visible properties and behaviour, or phenotypes, depending on the eco-system in which they are embedded. A hare in one niche will tend to have brown hair, because its chances of survival are higher. In a different habitat, a similar hare will be white.

For Darwin, the importance of this insight was that the process of interaction and selection was continuous, and cumulative in its effect. As a result of a species' interaction with the environment, some members of its population are randomly subjected to mutations in their makeup. They are born with a different phenotype, one that alternately heightens or reduces their chances for survival. Mutations that are adaptive spread through the population. Its carriers enjoy greater success in accumulating resources, and are therefore selected by the environment for survival and reproduction. Historically, Darwin believed, the process of random mutation and selection resulted in species change. Surviving members of an ecosystem were no longer mere variants, descendants whose traits fell within the potential range of characteristics displayed by their progenitors. Instead, the surviving members emerged as qualitatively different, a new genotype.⁹⁸

While it was a powerful interpretation of natural history, Darwin's theory presented problems for those seeking to harmonise it with the accepted form of scientific explanation, namely reference to efficient cause. The theory of natural selection did not cohere with a construction of change in which external force is seen to govern the actions of a system's passive constituents, with no effect on their internal organisation. As Alicia Juarrero notes, "with all causes reduced to efficient cause, the manner of causality whereby the selective pressures of the environment cause species to evolve into truly new forms became a problem in need of solution. . . ."

How external to an organism is the niche in which it is located if, over time, features of that environment

contribute to specifying the very primary properties of that kind of living thing? An organism's primary properties are, according to evolutionary theory, both a record of past environments and a conjecture about the current one. The overall species-niche super-system determines the traits that individual organisms will exhibit.⁹⁹

As Ernst Cassirer notes, evolutionary theory was not the only discipline in biology that faced the problem of explaining how a larger distributed whole regulated the properties of its constituent parts. In the late 18th century the philosopher Immanuel Kant was also preoccupied with the animate form as "a unified self-contained structure," a whole "so formed that it determines the properties of its various parts." Once formed, Kant realised its constituents ceased to be an aggregate and became a system, an active agent whose self-regulation and purposive interaction with the environment could not be accounted for by the tenets of efficient cause. Instead, Kant proposed "the principle of formal purposiveness," a formulation strikingly similar to the concepts of formal and final cause. In Kant's words, the purpose for the "principle of purposive combinations and forms in nature" was to provide one more means to "bring the appearances under rules, where the laws of mechanical causality do not suffice."¹⁰⁰

By appealing to an evolutionary framework in his history of the CPR, Innis was committing himself to a history that highlighted the same set of problems faced by the biological sciences. To start, Innis' framework required he establish the presence of a distinct ecology, one that would account for the internal organisation of the CPR. His mandate was also to produce a history in

which the company was seen as an organism functioning in an ecosystem, one constituted by North America's topography and the North Atlantic economy. He was also committing himself to produce a history in which a distributed whole, "a railway-niche super-system," governed the internal organisation of its constituent parts, a dynamic that Alicia Juarrero notes has "a strong echo of Aristotle's concept of formal cause. . . ." ¹⁰¹ And perhaps most importantly, he was committing himself to a history in which the internal organisation of the CPR, and the schema of its agents, were seen as a product not only of its present interaction with the environment, but also of past ones conducted by itself, and institutions from which it could claim descent.

The problem, however, is that narratively and empirically Innis failed to deliver in *A History of the Canadian Pacific Railway*. In his conclusion, Innis realised the need to ground his history with a description of the activities of Canadian institutions that had preceded the CPR, one that noted their interactions with the environment, their internal organisation, and the schema of their agents. Accordingly, on a general level, he noted that settlements in North America were distinguished by "the rapidity and directness with which institutions . . . were abandoned, or adjusted, or with which new institutions were created to meet effectively conditions imposed by a new environment." And with respect to New France, "an increased knowledge of new conditions, with the necessary adaptability and with the more suitable environmental characteristics of Quebec in the St. Lawrence valley, this civilization gained a foothold on the eastern shores of the continent and grew steadily and persistently." ¹⁰² Unfortunately, after Innis

completed his brief narrative of the history of New France, his description of the evolution of Canadian institutions stopped. There is nothing in his account that links the emergence of New France with the institutional organisation that would eventually be adopted by the Canadian Pacific Railway.

Instead, Innis turned his attention to the schema that British settlers developed as a result of settling in the American colonies, frameworks they brought to bear in their subsequent settlement of Canada, and the construction of the Canadian Pacific Railway. In settlements "further south along the Atlantic coast" British settlers also made "adjustments essential to the existence and growth of settlement," but in a topography very different from New France. With limited access to the interior of the continent, and the remote prospect of military invasion from a European competitor, British colonists abandoned the use of monopolies and other centralised institutions to organise commerce and government, and turned to extractive industries such as agriculture, fishing and lumber. The outcome was a colony with agents characterised by a mindset of "enterprise, initiative and aggressiveness."¹⁰³

In Innis' account the American Revolution prompted United Empire Loyalists and other British settlers to focus their attention on territories to the north of Lake Ontario and Lake Erie. The cultural traits of the settlers -- including their expectation of self-government -- proved incompatible with the political culture of Quebec. In the *Constitutional Act of 1791*, a rough divide between English and French settlements was created by the British government through the establishment of Upper and Lower Canada. The schema of British

settlers prompted change within Canada from the start, but in Innis' account it was just the beginning of a long process: "The loyalty to Great Britain characteristic of Upper Canada during this early period and the particular aggressiveness of this settlement were evident in latter developments."¹⁰⁴

One development was continuous effort by Upper Canada to procure transport infrastructure to ensure trade links remained, within Canada, and with the United States. A second development was the colony's initiatives to ensure British possessions to the West, particularly British Columbia after the discovery of gold, were not incorporated into the United States. In Innis' narrative, the two initiatives culminated in two significant developments, Confederation in 1867, and shortly thereafter an agreement with British Columbia to construct a railway to ensure the colony's entry into Confederation. The accord, Innis wrote, resulted "largely from the acquisitiveness characteristic of eastern Canada"¹⁰⁵ The Canadian Pacific Railway was the result.

While Innis' narrative of British settlement was intriguing, from the standpoint of Innis' own objectives it suffered from two major flaws. To start, as with his writings on the organisational makeup of New France, Innis never developed his initial insight that British cultural traits in North America were the result of settler interaction with the environment. While he recorded the emergence of an entrepreneurial worldview in New England, he said nothing about its subsequent adaptation after the United Empire Loyalists came to Canada. Once again, a promising point of departure was not taken to its conclusion in the narrative.

But at a fundamental level, Innis' account in its totality suffered from a second more pressing problem. His account was little more than an assertion, not a demonstration of the CPR's evolutionary past. It had no empirical support. While Innis provided evidence to document the CPR's history as a corporation, he did not provide support to demonstrate it operated in an ecology distinct from the U.S. Nor did he demonstrate that the industry's internal organisation was an adaptive response to that ecology, one inherited due to its descent from older Canadian institutions.

Innis realised his study suffered from these defects. In his autobiography he noted:

After the publication of my thesis I was compelled to think out my next fruitful line of study. I had enjoyed tremendously the instruments at Chicago and attempted to adapt and to use the various instruments with which I had become acquainted. I had a further uneasy feeling that my thesis was inadequate and indeed one or two reviews had pointed out this fact. I must, therefore, satisfy an uneasy conscience by continuing along lines which would offset its defects.¹⁰⁶

To offset these defects Innis set out on a course of study that was anticipated in the conclusion of his study of the CPR, namely a study of commodities, "and the marketing structure built up in relation" to specific commodities.¹⁰⁷ And for the first two decades of his career, Innis did precisely that, producing a succession of histories devoted to Canada's staple industries. References in the conclusion to extractive industries on the Atlantic coast led to studies of the timber trade,¹⁰⁸ Canada's wheat economy,¹⁰⁹ and most notably, *The*

Cod Fisheries.¹¹⁰ Reference to British Columbia's gold rush was in turn followed by a study of its mining industry in the mid 1930s.¹¹¹

But in the short-term after completing his first study, Innis limited his research focus to two areas. His studies at Chicago had not only stressed the importance of relating a firm's marketing structure with the physical characteristics of the commodity it sold, it had also underlined the need to study the topography, or eco-system in which it operated: "I realized that I must spend an enormous amount of time travelling about Canada and seeing at first hand its physical characteristics."¹¹² Innis' purpose in making the trip was to establish what maps and documents often obscured, namely that Canada contained a geographic coherence capable of sustaining a unified economic eco-system.¹¹³

Innis' second research focus was devoted to the history of Canada's earliest staple industry:

My immediate task was that of offsetting the limitations of my thesis by attempting to show the inherent unity of Canada as it had developed before the railroad in relation to lakes and rivers. For this reason I concentrated in the beginning on the history of the fur trade as the oldest trade on the continent.¹¹⁴

To write the evolutionary history of Canada's economic past that he sought, Innis' research agenda required he establish the presence of a unique eco-system, and trace the internal organisation of its institutions through time. Only then would Innis be able to write a convincing evolutionary history of the CPR, and only then would Innis be able to demonstrate the dynamics, and the forms of causation, that had governed Canada's economic past. It was a task he sought to

fulfill in *The Fur Trade: An Introduction to Canadian Economic History*. Let us see how.

III

Aside from his long-term commitment to describe the dynamics of economic change, Innis came with two other objectives when he published *The Fur Trade* in 1930. The first was to establish the existence of a distinct economic ecology, one that could be correlated with Canada's geography, and one that could be rhetorically employed to justify Canada's existence on ostensibly objective, rational grounds. Prior to *The Fur Trade*, these points were not assumed in Canadian political economy. If anything, the bias of the discipline ran in the other direction, due to the writings of W.A. MacIntosh and other scholars. In his writings, MacIntosh viewed the natural flow of economic activity as extending in a north-south direction, due to constraints imposed by Canada's topography. In his estimation Canada was "a nation created in defiance of geography" ¹¹⁵

In response, Innis argued that such assessments were based on examinations of the wrong history and the wrong topography. Drawing on the research indicated in his autobiography, Innis argued that Canada's Pre-Cambrian shield revealed river systems that extended from the east to the west, ones that circumscribed trading networks that dated back to the 17th century. The contours of those networks, Innis argued, coincided with the present-day borders of the Dominion. Through an appeal to topography and history, Innis' purpose in *The*

Fur Trade was to demonstrate that Canada "emerged not in spite of geography but because of it."¹¹⁶ Through appeal to a distinct economic ecology, Innis also hoped to explain the characteristics of important Canadian institutions such as the railway and banking industries. Their internal organisations -- or genotypes -- differed from their American counterparts. The U.S. had regional railways. Canada had national railways. Innis hoped to show these differences stemmed from distinct histories, and distinct ecologies.

Innis' second purpose was to demonstrate that the extent of the ecology within which Canada operated as an economic agent was much larger than traditionally assumed. Prior to the publication of *The Fur Trade*, Canadian historiography had generally reflected the tenets of the frontier hypothesis, the contention by the American historian Frederick Jackson Turner that a distinct American culture emerged in the 19th century due to protracted interaction with the environment by European settlers. Adapting Turner's argument to Canada, Canadian historians argued that the characteristics of Canadian institutions were the product of interaction with their local environment.¹¹⁷ In Innis' mind, Turner's argument overemphasised the impact of the indigenous environment, especially in the case of Canada, and underemphasised the connections English, French, Dutch and Spanish settlers had maintained with their respective homelands. Given the continuous interaction, the most the historian could claim was that Europeans modified their institutions and practices to meet the demands imposed by local conditions. But such modifications did not presuppose transformation. Canada

and the United States remained part of the cultural discourse of the West, and were, in essence, European.¹¹⁸

Innis begins his narrative with the selection by European and Aboriginal traders of fur as the commodity to be extracted from the environment for the purpose of trade. The French selected fur by virtue of their need to secure European goods. The beaver pelt was attractive because it was readily obtained, susceptible to shipment by small boat, and capable of fulfilling a European demand for luxury goods while yielding a high profit. Aboriginals were involved in the selection process because of their agreement to procure the furs and bring them to the French in New France.¹¹⁹

In Innis' account, the fur trade was subjected to episodes of market disequilibrium from its beginning as a sustained enterprise in the 17th century. Initially, French traders operated in a market characterised by competition. The problem as Innis described it was that the environment initially was too competitive. Aboriginal traders were able negotiators, and refused to bargain until a number of European traders were present. The price of European goods was driven down as natives bargained to attain the best price for their pelts. In French eyes, it was impossible for European traders to obtain a profit in such a highly competitive environment. In the face of market pressure French traders self-organised into combinations that were later formalised under Samuel Champlain in 1613, and by the French government in the 1620s in the form of charter monopolies:

To the rendezvous was brought down each year
what is called, in the parlance of economics, an

inelastic supply of furs which was to be exchanged for an inelastic supply of European commodities. It was unprofitable for either party to return with the goods brought. Under competitive conditions the supply of European goods tended to be larger, furs were obtained at greater cost, and profits disappeared Through a gradual realisation of the numerous difficulties of competition, Champlain was able to arrange monopoly control. Cooperation was apparently essential even under conditions of competition. Some of the traders joined forces with Champlain in his fight with the Iroquois in 1610. In 1611 a *patache* brought a supply of provisions to Lachine Rapids for all the competitors. These intangible forms of cooperation preceded the loose association of 1613 and the later monopolies. Undoubtedly the result was the first trust in North America, and the honor of being the first successful trust promoter must be given to Champlain.¹²⁰

The tendency toward monopoly was reinforced in the 1660s as the French trading network with the Huron and other First Nations collapsed, due to war, disease, and the decimation of the local beaver populace. The French were forced to extend their commercial activities into the interior of the continent, and in so doing continued to rely on monopolies to regulate the market. According to Innis, the French had little choice since only large firms could accumulate the capital necessary to sustain a large trading network, and to co-ordinate its activities. The monopolies established outposts and other infrastructure in the interior, hired traders, ensured food was available for them in the interior. In addition, monopolies were required because they had the means to ship large quantities of furs to Europe to meet costs, and to procure large quantities of French manufactured goods for use in the trade.¹²¹

The disequilibrium imparted by the collapse of the first trading network, however, engendered a second period of self-organisation, and the establishment of forms of institutional organisation that would persist through to the establishment of the Dominion. According to Innis, the re-organisation of the French fur trade had three important consequences. First, it forced the Company of New France and succeeding monopolies in Quebec and Montreal to cede control of internal trade to independent traders resident in the interior. Competition with the English mandated the instigation of new trading contacts with natives in increasingly remote areas, contacts that could only be garnered by the willing co-operation of traders. Consequently, merchants were forced to relinquish a greater share of their profits to local traders, and to relinquish control over the terms of trade: "The result was essentially a type of organization in which profit sharing or partnership developed between the trader in the interior and the Montreal merchant."¹²²

Aside from the reorganisation of the trade, the second important effect of the economic dislocation of the 1660s was the growing importance of final cause in the decision-making of the French. Recall from our previous chapter that one characteristic of self-organising systems is that they are governed by schema, which mediate their interactions with the environment, and change as systems learn more about their environment. As we saw in the previous chapter, Robin Neill has noted that Innis' attention to values, or final cause was a defining feature of his economics.¹²³ It was also a defining feature in his narration of *The Fur Trade*. According to Innis, in the wake of their reformation of the fur trade,

French merchants and traders altered the European concept of monopoly to meet local conditions. The lessons they drew proved adaptive to their local environment, and persisted:

The period of development of the fur trade on a large scale as an independent industry witnessed the evolution of distinctive organizations. Typical European institutions of the period such as the monopoly were adapted and modified according to the demands of a new environment. The inherent dependence of the trade on its personnel and the increasing stress on this dependence with the exhaustion of the supply of beaver led to the development of an internal organization in which the individual traders took an increasingly important part. . . . The dominance of the local trader in internal organization was not carried to the external organization of the trade between Quebec and France.¹²⁴

As we shall see, the lessons drawn by the French regarding business organisation were ones that would be adopted by British and Canadian policymakers after the fall of New France.

The final consequence of the trade's re-organisation was heightened state participation in the conduct of the trade, chiefly through mobilisation of the colony's institutions to support the fur trade.¹²⁵ According to Innis, the changes were prompted in part by a desire to maintain revenue, and in part by economic processes, processes we can identify with formal cause. Recall from our previous chapter that in systems governed by formal cause, the larger distributed whole governs the behaviour of its constituent parts. Autocatalytic sets, for example, regulate the flow rates of their constituent processes to maintain their formal integrity. The earth and moon are governed by formal cause because the earth in

isolation would display a different behavioural trait, namely no tidal patterns.¹²⁶

According to Innis by the 18th century a similar dynamic had transformed the internal organisation of both France and New France:

Commodities to exchange for furs were manufactured on a large scale, and served to stimulate the economic life of France. On the other hand fluctuations in the market for furs reacted on industrial life and affected her position. The economic and institutional life of Europe had reached a period of comparative advantage and balance previous to the discovery of the New World. The economic and institutional life of France undoubtedly suffered material disarrangement through the importation of furs on a large scale from New France.¹²⁷

Much of the fluctuation in the market was precipitated by English competition. As early as the 1630s, the internal organisation of New France began adapting to the more competitive environment, with the French government instituting reforms to ensure the colony's continued ability to procure fur:

The energies of the colony were directed to defence against the Iroquois and to the problem of keeping open the St. Lawrence and the Ottawa route. . . . To carry out these militaristic measures, the colony was subjected to a centralised policy in all its activities. Trade, agricultural development as in the seigniorial tenure, and even religious activities, as shown in the exclusion of the Huguenots and later control of the Jesuits, reflected the influence of centralised control.¹²⁸

New France, by devoting the majority of its human and financial capital to the fur trade, placed itself in a destructive cycle from which it never recovered. By the mid-18th century, the fur trade had expanded from the St. Lawrence

drainage basin to the drainage basin of Hudson Bay. Acquisition and transport of furs had become expensive, and in Innis' narrative the French were consistently outbid for their furs by English competitors in the south and north. Moreover, English manufactured products -- especially woolen cloth -- were superior to French products, and easier to access for natives with the best furs, those living near Hudson Bay. While profits declined, costs increased as networks of military posts were constructed to prevent Indians from trading with the English. An increasing proportion of revenue from the fur trade had to be diverted to protect a dwindling source of revenue. It was a cycle that New France was never able to break, and one that consolidated its dependence on France for military protection and industrial products. Given its constraints, New France lost its dominance of the fur trade. And given the absence of a diversified economy, the colony was unable to attract migration or generate the resources required to ensure its survival.¹²⁹

New France collapsed economically, and then politically with the Conquest. After Britain's formal assumption of control of the colony in 1763, the fur trade fell into British hands. As Innis notes, due to facing the same constraints as the French the British over the course of the next 15 years "found it necessary to develop an organization which had features strikingly similar to those of the French *régime*."¹³⁰ Many of the reforms reflected French influence, suggesting again the importance of final cause in Innis' narrative. The reliance of new institutions on the expertise -- and schema -- of individuals from old or defunct

extractive industries is a theme that Innis would return to repeatedly in *The Fur Trade*.

In the case of the British this meant altering their practices and approach in two fundamental ways. Prior to 1763 the British had relied on aboriginal traders to bring furs to outposts along Hudson Bay or in Albany, New York. Solicitation of trade and the maintenance of personal relationships with trading partners had not been British practices. But most notably in the case of the Northwest Company, which inherited the French trade routes in the St. Lawrence Basin, British merchants learned from French *voyageurs* the importance of establishing working relationships with aboriginal suppliers. The British were no more able to compel trading partners to come to Montreal than the French.¹³¹

The British were also forced to change their schema regarding the internal organisation of the trade. Facing restriction on trade occasioned by the American Revolution, Montreal merchants were obliged to extend their commercial activities to the west. And there they faced the same constraints governing the trade that had faced the French. According to Innis: "Methods of control and regulation adequate to the English trade were inadequate to the new demands."¹³² Facing the challenges of servicing a constantly rising demand for European goods in the West, arranging for the shipment of furs to Europe, and installing depots to provide provisions for traders, the British had no choice but to cede control of commercial activity to traders in the interior. With respect to the French trade, Innis noted that it had "adapted to its specific geographic areas" and that its organisation "persisted with unusual tenacity."¹³³ In his narrative of the British

trade, Innis pointed to the emergence and persistence of the same pattern, both cognitively and organisationally:

The principle of the partnership was to persist as the dominant type of organization of the fur trade practically until the end of the nineteenth century. It was the device with which the trade could be prosecuted with great effectiveness over great distances in which the central authority could exercise no direct control over the individual trader.¹³⁴

Aside from learning the need for distributed control within firms the British also mirrored French practice through resort to combinations between firms, in order to adapt to changing conditions in the ecological and economic environments of the time. Despite the efforts of traders such as Alexander Mackenzie, the British trade never thrived under conditions of competition, even as it created an economic space that would eventually be transformed into the political space of Canada. Profits fell, and firms such as Mackenzie's XY Company eventually amalgamated with the dominant combine, the Northwest Company. Ultimately, the Northwest Company itself would amalgamate with the Hudson's Bay Company. In the parlance of *complex adaptive systems*, the characteristics of the British fur trade demonstrated differential persistence.¹³⁵

According to Innis, the characteristics of the fur trade persisted and spread to other sectors in Canada's economy as it diversified and became more complex. By the end of the 18th century, the fur trade had shifted west and north, necessitating the development of new lines of trade in the Canadas. In Innis' estimation, British North America by the start of the 19th century had become immersed in an international economy that encouraged its continued

specialisation in staple products. As Innis described it, especially in his description of economic change in Upper Canada, the effect of the North Atlantic economy was akin to formal cause. The colony interacted through trade with Britain. Positive feedback in the form of profits led to the formation of a system, which in turn determined the internal organisation of the two trading partners:

Energy has been directed toward the exploitation of staple products and the tendency has been cumulative. The raw material supplied to the mother country stimulated manufactures of the finished product and also of the products which were in demand in the colony. Large-scale production of raw materials was encouraged by improvement of technique of production, of marketing, and of transport as well as by improvement in the manufacture of the finished product. As a consequence, energy in the colony was drawn into the production of the staple commodity both directly and indirectly.¹³⁶

Faced with similar market conditions, Canadian institutions employed similar strategies to acquire needed capital, resources and revenue. In Innis' mind, the commonality in practice was no accident, since the "transport organization and personnel of the fur trade and its capitalistic beginnings were shifted to the development of new lines of trade."¹³⁷ In the wake of the 18th century, the timber trade emerged as the dominant staple industry in Canada due to the British shipbuilding industry's demand for forest products. The beneficiary of transport infrastructure developed by the fur trade, the timber industry was itself a significant contributor to the economic development of Canada.

According to Innis, while the fur trade had carved out a significant economic space in the Canadas and to the west, it had not promoted the settlement

necessary to translate both spaces into viable political entities. Indeed, the trade presupposed vast tracts of unsettled territory. The timber trade, by contrast, had an incentive to promote settlement to reduce its operating or overhead costs. While participant firms had an obvious source of cargo for ships heading to Europe, they faced the problem of empty cargo holds for the return trip. Transporting migrants proved to be a good source of revenue. The outcome of heightened settlement was the economic diversification of the two Canadas, and according to Innis a new set of challenges for the colony's policymakers. While the timber trade was able to make use of the existing network of rivers, lakes, and rapids to transport logs to mills for processing prior to shipping them to Europe, producers of other commodities, such as wheat and potash, could not. Additionally, the rudimentary transport infrastructure made it difficult for colonists to obtain imported manufactured goods.¹³⁸

By virtue of their need for transport infrastructure, and their emerging specialisation in extractive industries, Innis argues the acquisition of foreign capital became a high priority for business and government policymakers in the two Canadas. That imperative, coupled with the boom and bust nature of staple markets, prompted the transformation, or self-organisation, of the financial and constitutional structures of both colonies as Canadians sought to maximise their capacity to obtain capital from foreign markets. The ultimate outcome of the process, Innis argued, was Confederation, as Canadians increasingly looked to the state to underwrite foreign loans.¹³⁹

The imperative towards centralisation initially appeared, Innis argued, in the financial sector, which had its roots in the fur trade: "An extended financial organization under the fur trade was attested by the plans for the first establishment of a bank in Canada with the strong support of Phyn and Ellice and the establishment of the Bank of Montreal in 1817 with John Gray, an old fur trader, as president" ¹⁴⁰ The emerging financial sector shifted its focus to the newly dominant timber trade entering into an association that would eventually transform it:

Canada's financial organisation had been greatly strengthened through the strains incidental to the lumber industry. The crises in Great Britain and the United States in 1825-26, 1837, 1847, and 1857 had serious effects on construction industries and on the trade of a country interested in the export of lumber. The collapse of weaker banks in these periods contributed to the centralisation of banking structure which became conspicuous in the period after Confederation. The fur trade and the lumber industry contributed the basic features essential to expansion after Confederation. ¹⁴¹

Faced with market shocks similar to the ones experienced in the fur trade, Innis argued that Canadian bankers resorted to the schema and organisational forms that had proved adaptive in the fur trade. There was a parallelism, Innis maintained, between the distributed control of the fur trade and the "branch bank system with headquarters in the east No such tendency toward unity of structure in institutions and toward centralised control as found in Canada can be observed in the United States." ¹⁴²

The need for capital to construct transportation infrastructure also twice prompted the reorganisation of the Canadian state during the 19th century. The

union of Upper and Lower Canada in 1840, according to Innis, was stimulated by the need for canals. But in Innis' narrative, this only proved a short-term expedient. Cold weather hindered year round use of the canal, while the railway emerged as a more flexible alternative, one that even prior to Confederation exercised a catalytic effect on Canada's economy and staple industries. In the case of the lumber industry, it increased its capacity to access raw materials and then ship them to market. By the 1860s, the largest trees nearest easily accessible waterways had been cleared, heightening the industry's difficulties in accessing and then transporting supplies to market. Railways opened the mid-Western American market to Canadian producers, and eased the difficulty in transporting logs to sawmills for processing.¹⁴³

The railway's success in transporting timber to new markets and migrants to new settlements precipitated calls for expansion of existing networks, and eventually formation of the Dominion:

The lumber industry of eastern Canada was largely responsible directly and indirectly for the improvement of waterways and for the construction of railways prior to Confederation. Canal and railway construction was synonymous with heavy capital investment. Capital was obtained through private enterprise and substantial guarantees and aid from the imperial and colonial governments. Heavy expenditures involved the development of a strong centralised government in Canada.¹⁴⁴

For Innis, the formation of the Dominion emphasized the importance of two recurring patterns in Canada's economic history. Large central organisations

such as the Northwest Company had perpetually emerged in Canada because the environment within had not supported unregulated extraction of staples while the environment without had refused to provide the requisite capital to small-scale institutions. From an evolutionary standpoint, large-scale institutions with a limited degree of distributed control enjoyed a selective advantage. The second significant pattern was that institutions supporting the staples trade generally assumed the same form of organisation that characterised the staples trade, generally because the same agents occupied roles in both the staple industry and the supporting institution.¹⁴⁵ Such had proven to be the case with Canada's financial institutions, and such proved to be the case with the Dominion and its adoption of a federal form of government:

The British North America Act, like the Act of Union, has provided for a strong central government. The prairie provinces as producers of wheat were controlled from Montreal and Ottawa as they were controlled in the earlier period as producers of fur under the Northwest Company. With the United States residuary powers were left with the states whereas in Canada they remain with the federal government or rather with eastern Canada.¹⁴⁶

With his history of Canadian institutions in place, with its emphasis on continuity with respect to agents and forms of organisation, Innis was in a better position to account for the internal organisation -- or genotype -- of the Canadian Pacific Railway than in his earlier book devoted to the topic. In his estimation, the large central organisation of the CPR was due to three factors, the first being the necessity of forming a large organisation to attract foreign, primarily English,

capital. The second reason was the desire to reduce overhead costs. In Innis' reading, Canadian policymakers prior to Confederation were well aware of the economic burden that massive investment into a railway network would entail. Maintenance of the railway would involve paying heavy overhead costs, ones that could not be dispelled even with attraction of new settlers to the colonies, new settlements, and expansion of agriculture in the province of Canada. Decision-makers in the private and public sectors believed railway expansion was viable only if the network was extended beyond Canada to the west. The increased traffic would reduce overhead costs, and the economic strain upon central Canada.¹⁴⁷

Third, close ties between agents in the fur and railway industries, and the government facilitated development of a large centralised railway. Grand Trunk Railways interests purchased the Hudson's Bay Company, and its jurisdiction over Rupert's Land, in 1863. Confederation followed in 1867, an instrument in Innis' reading used by these agents to attract English capital to facilitate western expansion. The sale of Rupert's Land followed in 1869.¹⁴⁸

In sum, a network of agents with common aims, and a common economic space under the control of the fur trade, enabled the emergence of a national railway: "The large central organization in the fur trade facilitated the transfer and the organization of the new technique [machine industry in general and Canada's railway in particular] over a wide area."¹⁴⁹ In Innis' reading, Canada's elite shared common beliefs regarding Canadian economic policy, and the appropriate organisation for the railway industry, because its members shared a

common schema, one that traced its origin to the fur trade. The internal organisation of the CPR in Innis' narrative was in large part determined by final cause:

The fur trade and its personnel continued to be fundamentally important. The fur trade had not only produced a centralised organization but it had produced a succession of fur traders who were typically self-reliant, energetic, and possessed of keen bargaining ability and high organizing capacity. D.A. Smith . . . was not only an important official in the Hudson's Bay Company, trained in the school of the fur trade, but he was an influential force in the construction and management of the Canadian Pacific Railway which heralded the new industry. The relationship which existed with the opening of western Canada, in which important officials of the Hudson's Bay Company were prominent in the activities of the Bank of Montreal, of the Canadian Pacific Railway, and of the Dominion government, was not accidental.¹⁵⁰

At the conclusion of his study, however, Innis was careful to emphasise that the internal organisation of the Canadian economy in general and the CPR in particular were not solely due to the presence of agents and persistent schema. If Canada was distinguished by large centralised institutions with limited degrees of distributed control, and close collaboration between its government and industries, it was because its economy was embedded in a system characterised by emergent properties and the governance of formal cause, characteristics we would identify today with *complex adaptive systems*. With respect to the former, Innis' most concise and explicit reference to the importance of emergent properties appeared in *Empire and Communication*, a work he published 20 years after the release of *The Fur Trade*:

Concentration on the production of staples for export to more highly industrialized areas in Europe and later in the United States had broad implications for the Canadian economic, political and social structure. Each staple in its turn left its stamp, and the shift to new staples invariably produced periods of crises in which adjustments in the old pattern were painfully made and a new pattern created in relation to new staples.¹⁵¹

In the parlance of *complex adaptive systems*, new dissipative structures emerged to enhance the system's capacity to interact with the environment. That capacity, however, was also enhanced by the governance of formal cause over Canada's economy. Here the key insight Innis sought to convey was that the Canadian economy functioned as an active agent. As such, it routinely altered the identity, the internal organisation, and the arrangement of its constituents in order to heighten its environmental fitness, and to maintain its formal integrity. With respect to formal cause, Alicia Juarrero notes that the organisation of *complex adaptive systems* and autocatalytic sets "are preserved even at the expense of the individual parts that make up its structure at any given moment." The final configuration of a set might differ in appearance from that of its original progenitor.

The ordered environment in which the components of an autocatalytic cycle -- or any complex dynamical system -- exist thus selectively (top-down) constrains their behavior and activities. . . . A component that may be fit in one context may not be in another; a structure that may be fit in one context or at one time may not be in another. Far from being a primary quality, therefore, fitness is a multiply realizable property . . . that depends on what occurs elsewhere and previously.¹⁵²

There is a striking parallelism between this formulation and Innis' own summary of the staple hypothesis at the end of *The Fur Trade*. Both refer to systems with trajectories partly determined by historically contingent events. Both refer to systems that bifurcate into new arrangements of constituent parts. And both refer to systems capable of incorporating new agents and new realms of activity, while dispensing with sectors that no longer contribute to the fitness of the entire system. "The trade in staples," Innis notes, . . .

. . . , and especially the fur trade, has been responsible for various peculiar tendencies in Canadian development. The maintenance of connections with Europe, at first with France and later with Great Britain, has been a result. The diversity of institutions which has attended this relationship has made for greater elasticity in organization and for greater tolerance among her peoples. This elasticity of institutions facilitated the development of the compromise which evolved in responsible government and the British Empire. Having failed in her own colonial policy England was able to build up an empire in Canada on the remarkable success of French colonial policy. The fur trade permitted the extension of authority and independence across the northern half of the continent. Moreover, the business structure shifted from the elastic organization characteristic of the Northwest Company. . . to the more permanent organization from Hudson Bay. The diversity of institutions has made possible the combination of government ownership and private enterprise which has been a further characteristic of Canadian development.¹⁵³

The elements of *complex adaptive systems* and formal cause are all there. By referring to the "extension of authority and independence across the northern half of the continent"; "the remarkable success of French colonial policy"; and British use of the same to develop responsible government, Innis was emphasising that the Canadian economy was historically constituted by agents. These agents

interacted with each other, and with the natural environment. Collectively agents in Europe and North America selected fur for extraction from the environment, due to the historical contingencies of European taste and technology and abundant supply of beaver pelts. The selection was important, in that it was "responsible for various peculiar tendencies in Canadian development." Because the environment in which these agents interacted remained at "the edge of chaos", or at the right mean between "authority and independence," the economy in North America displayed emergent properties in the form of new institutions and schema.¹⁵⁴

The purpose of this commercial activity was straightforward, namely "maintenance of connections with Europe, at first with France and later with Great Britain." By virtue of its interaction with trading partners across the Atlantic, and the positive feedback it received in the forms of profit and technology, Canada and its predecessors became part of a trading network, susceptible to the governance of final and formal cause. Final cause was indicated by the repeated initiatives of Canadian institutions to maintain their trading relationship with Europe, and their frequent resort to a schema of distributed autonomy, mixed "authority and independence," to regulate their interaction with the environment.

Formal cause was indicated by the changing organisation of the economy and the institutions comprising it. Maintenance of a sustainable relationship with the environment and trading relations with Britain at times meant in the parlance of *complex adaptive systems* that the "ordered environment" of the Canadian

economy constrained "the behaviour and activities" of its constituent parts. In the 19th century the structure of the fur trade changed. With no new territories available for acquisition, environmental constraints obliged the trade to modify its internal organisation to remain profitable, shifting from the distributed system of control characteristic of the Northwest Company to a monopoly, "the more permanent" form of organisation favoured by the Hudson's Bay Company.

The constraints of the international economy also prompted change. Here Innis emphasised the importance of the elasticity that characterised Canada's economy. At the institutional level, the tension between centralisation and decentralisation facilitated self-organisation, including the re-organisation of the Canadian state. At the national level, it indicated a similar form of distributed control, and the governance of formal cause. The economy as Innis described it was an agent, a combination of components akin to a network, one that routinely acquired new components to heighten its fitness and maintain its trading ties with Europe: "The diversity of institutions which has attended this relationship has made for greater elasticity in organization and for greater tolerance among her peoples." In other words, Canada's economic history had followed a path much like the evolution of an autocatalytic set. By virtue of the economy's history -- namely its selection of staple products for exports -- and its reception of profit and capital from the North Atlantic economy, Innis argued that events occurring, in Juarrero's words, "elsewhere and previously" led to the evolution of an economy with unique characteristics. The capital-intensive nature of staple industries

mandated the early selection of the government by institutional networks seeking to acquire capital from abroad.

Given Canada's specialisation as a producer of staples, the maintenance of its formal integrity as an economy required continued access to funding. And according to Innis, while the identity of participant institutions changed, one persistent feature of Canada's economic past was the selection and incorporation of the government into new coalitions of institutions, in order to heighten its fitness abroad: "The diversity of institutions has made possible the combination of government ownership and private enterprise which has been a further characteristic of Canadian development."

IV

For Innis, then, the staple hypothesis at base referred to a conception of economic change, one that reflected the economics he promoted in his Veblen essay. In his estimation, Canada's economy throughout its history had been comprised of systems that displayed emergent properties, and in turn were governed by formal and final cause. The reading also suggests -- on a preliminary basis -- two things. First, it suggests that Innis' work can be characterised as a methodological and conceptual forerunner of current trends in Atlantic historiography. The verdict is tentative because in *The Fur Trade* the Atlantic Basin is essentially a bit player, a supporting castmember to the play's principal, the Canadian economy. To characterise Innis as a forerunner of Atlantic

historiography we shall need to explore the work in which the Atlantic trade is his principal object of attention, namely *The Cod Fisheries*.

The reading also suggests that the foil we have used to read Innis' economic histories, namely the staple theory of development formulated by Mel Watkins, does not reflect the centre-margin dynamic discussed by Innis. The reading is again preliminary because Innis does not tell us a great deal about the centre in *The Fur Trade*. There is little specification about its identity. Is it a unitary actor or does it consist of multiple agents? Little is said about its relative historic success in effecting change. To be sure Innis does tell us that the internal organisation of France was affected by the fur trade, and that the French government enjoyed substantial agency in changing the internal organisation of France. He also tells us that "the economic history of Canada has been dominated by the discrepancy between the centre and the margin of civilization."¹⁵⁵

On balance, Innis does not tell us much. But on balance, what he does tell us offers more support for an identification of Innis' writings with a systemic form of change. While Innis' description of the French state's re-organisation of New France suggests an identification with Watkins, the tenets of dependency theory, and a normative conception of change, Innis' general propositions regarding Canada's economic history do not. Notice in his formulation regarding Canada's relationship with its respective centres that Innis does not suggest the discrepancy in status is due to imperial domination. Instead, Innis appealed to the economics of increasing-returns, the process of cumulative causation that we saw in this chapter, and the process that we shall learn more about in the following chapter.

As we shall see, reference to the concept of increasing-returns will prove extremely useful not only for interpreting Innis' writings on the history of the cod fisheries, but also for understanding his writings on cognitive bias and communication media.

Innis' conclusion suggests that he saw government action as relatively less important. While imperial state intervention could reinforce economic trends in place through instruments such as mercantile policy, Innis did not see such actions as determinative. Canada's economic relationship with Great Britain after the institution of free trade in the 19th century remained much as it had during the mercantile era. Due to the process of cumulative causation, and formal cause, Canada retained its specialisation as an exporter of staples.¹⁵⁶ To reinforce this reading of Innis' conception of the North Atlantic economy, however, we shall need to examine his writings devoted to maritime trade, and the economic activity that precipitated it, the cod fishery. In *The Cod Fishery*, Innis would say a great deal about the rise and fall of the European empires that circumnavigated the Atlantic, and the economic processes that facilitated their emergence and hastened their fall. These processes mediated the relationships of London and Paris with their disparate colonies. And as we shall see, the mediation Innis described was in the form of formal and final cause.

Chapter Three: *The Cod Fisheries*

In *The Cod Fisheries: The History of an International Economy*, Harold Innis presents us with a history that is far more ambitious in scope, and far more complex in matter, than his study of the fur trade. While referring to the importance of the international economy in *The Fur Trade*, Innis' primary concern, as he indicated in his subtitle, was the economic history of Canada. In *The Cod Fisheries*, by contrast, he shifted his focus to a different staple, a different ecosystem, and to the history of the North Atlantic economy at large. Innis' purpose was to study the economic histories of Canada's maritime provinces, Newfoundland, and New England, territories which in their totality had comprised the economic region that had enabled the North Atlantic economy to function, through its exploitation of the cod fishery and its participation in the carrying trade.

In studying the economic histories of these areas, Innis sought to demonstrate yet again the core proposition of the staple hypothesis. Namely he argued that the structural organisation of North America, and to a lesser extent Europe, was the by-product of trade in staples across the North Atlantic.¹⁵⁷ The disparate regions of North America were distinguished by different political, social and economic structures, products of the initiating stage of European economic activity in each region. According to Innis' evolutionary framework, these structures emerged as European agents extracted selected staples from distinct environments. They also persisted over time, or displayed *differential*

persistence. Such had been the case in the interior of North America. It was a supposition that Innis would seek to demonstrate again in *The Cod Fisheries*, which was published in 1940.

And yet, Innis' introduction to *The Cod Fisheries* also revealed a far more fundamental commitment, a desire to describe the dynamics that governed the economic history of the North Atlantic economy. In the period to which he devoted the majority of his attention, from 1497 to the 19th century, Innis argued that the structure of the international economy changed, from one regulated by states and monopolistic companies through the mercantile system, to one with thousands of participating agents in a commercial economy.¹⁵⁸ At the same time, the major European powers bordering the Atlantic -- Britain, France, Spain and Portugal -- were locked into a contest to establish an economic, and then an imperial, presence in North America. In Innis' estimation, the progression of the former had a direct bearing on the latter: "The problem of markets is a phase in the collapse of empires."¹⁵⁹

To trace this two-fold process, Innis proposed a study of the cod fishery, a choice he justified by noting that the North American fishery was an important arena in "the intensity of the struggle between mercantile systems and empires, and the struggles within mercantile systems."¹⁶⁰ It had also historically proven an important stimulant to economic development. Construed as a necessary component of naval defence, European fishing industries received support from the state, and were an important source of food, a stimulant to trade, and a catalyst for the exchange of specie, an exchange in which Britain and France proved to be

the beneficiaries, and Spain and Portugal the losers. In Innis' account, a successful fishery was an essential prerequisite to economic diversification. Economic diversification was a defining attribute of a successful mercantile system. And in the case of North America, a successful mercantile system -- for a time -- was the basis for a stable imperial regime in North America.

Innis also highlighted the importance of the fishery for a different reason. Its history brought into sharp relief -- one sharper than the fur trade -- the dynamic of cumulative causation that historically had prompted economic growth and diversification, and equally had prompted imperial decline and collapse. From the standpoint of his long-term commitment to describe the dynamics of economic change, Innis' primary concern, in his various histories of the cod fishery, was to learn more about a trading system governed by the economics of increasing-returns. Innis said as much in "The Economic History of the Maritimes," a 1931 article in which he provided a concise overview of the narrative he would later present in *The Cod Fisheries*. In his conclusion, Innis noted that the industrial revolution of the 19th century was transforming the characteristics of the North Atlantic economy from those that pertained in the 18th century. This was not necessarily a good thing, Innis counselled, since industrialisation was limiting ownership of the carrying trade into fewer and fewer hands, a development that potentially might place greater constraints on agents on both sides of the Atlantic engaging in trade. While the future of the international economy could not be predicted, Innis emphasised that a fundamental principle of economic change would prevail. It had governed the

economic systems he had studied in the 17th and 18th centuries, and had received its classic formulation in Adam Smith's *The Wealth of Nations*:

As it is the power of exchanging that gives occasion to the division of labour, so the extent of this division must always be limited by the extent of that power, or in other words, by the extent of the market.¹⁶¹

For economists, this formulation has traditionally had a special significance, one that extends beyond the importance of exchange and the onset of division of labour. It is also understood to refer to the process that *induces* division of labour in emerging markets, namely the economics of increasing-returns. Kenneth Arrow, a Nobel Prize winning economist, notes that "the concept of increasing-returns has had a long but uneasy presence in economic analysis."

The opening chapters of Adam Smith's *The Wealth of Nations* put great emphasis on increasing-returns to explain both specialisation and economic growth. Yet the object of study moves quickly to the competitive system The English school . . . followed the competitive assumption, and quietly dropped Smith's boldly stated proposition that, "the division of labour is limited by the extent of the market," division of labour having been shown to lead to increased productivity.¹⁶²

By appealing to Smith, then, Innis is signalling that the concept of increasing-returns is an important constituent of his maritime histories, one that we would do well to learn more about. Accordingly, in the first section of this chapter we will explore the economics of W. Brian Arthur, an economist with the

Santa Fe Institute in New Mexico, the institution famous for its inter-disciplinary study of *complex adaptive systems*. Since the 1980s, Arthur has been at the forefront in promoting the study of systems governed by increasing-returns in the contemporary discipline of economics. He has also been instrumental in demonstrating that the characteristics of such systems can be harmonised with the theory of *complex adaptive systems*. As such Arthur's writings will prove useful, not only to interpret *The Cod Fisheries*, but also as a means to bridge Innis' later writings with the theory of *complex adaptive systems*. In his communication studies, Innis wrote as an economist. He used the vocabulary of an economist. Learning more about the economics of increasing-returns will enable us to reconstruct the dynamics of cultural and cognitive change that Innis believed governed past and present cultures, and the role he saw communication technology playing in effecting that change.

After we have learned more of the framework suggested by Innis, we will trace Innis' application of it in three of his works devoted to the history of the North Atlantic fishery. In our second section, we shall examine "The Rise and Fall of the Spanish Fishery in Newfoundland, " which Innis published in 1931. For Innis it was an atypical work, since it is one of the few histories he wrote in which the economy of an imperial power is the sole focus of his analysis. It provides us, however, with the opportunity to re-introduce a question posed in the previous chapter, namely the nature of the international economy that governed the relationship between imperial centre and its disparate margins.

As we shall see in the section devoted to the Spanish fishery, and in succeeding sections, Innis' portrait of the international economy was more complex than that posed by Mel Watkins in his theory of staple development. In Watkins' line of reasoning, Spain, by virtue of its roles as an importer of specie and as a source of capital, should have emerged as a diversified economy, and a metropole, not only to its own colonies, but also to its neighbours in Europe due to its financial strength. But as we shall see, in Innis' model even Spain, despite its best efforts, was unable to organise the North Atlantic economy according to its own designs, since the state was not the only actor within the country. The Kingdom of Spain was comprised of competing interests, not a single centre. In Innis' narrative, some sectors of the Spanish economy wished open trade with neighbouring European states, while competing interests pressed either for no trade, to generate a self-sufficient economy, or highly regulated trade, to benefit the Spanish shipping industry. According to Innis, the competition between the two spheres would have a profound effect on Spain's economic development.

A similar portrait of the internal constitutions of Britain and France will emerge in our third section, in which we will examine "The Economic History of the Maritimes" and *The Cod Fisheries*. There we shall see Britain's and France's respective efforts to construct viable fisheries and empires in North America. As we shall see, Innis characterised both as succeeding in the former task, but only Britain as succeeding in the latter. And Britain's success in creating a viable empire was limited in its duration. For Innis, the rise and fall of empires was

predicated on their capacity to adapt to the economics of increasing-returns, a task in which neither enjoyed stellar success.

In our final section, we shall again assess the normative theory of economic development, this time with the benefit of a reading from Innis' two major works devoted to staples. As we shall see again, in Innis' histories the form of change governing the North Atlantic economy is of a much different cast than that proffered by Watkins. Innis' narrative instead refers to the importance of positive feedback in the form of increasing-returns, the presence of emergent properties in economic systems, and the governance of formal and final cause.

I

W. Brian Arthur is a leading proponent of the Santa Fe school of economics, which holds that market behaviour cannot be wholly explained without reference to positive feedback mechanisms, or increasing-returns. Despite concerns raised by Innis and a minority of economists in the first half of the 20th century, most economists prior to the mid-1980s refused to engage in analyses of the dynamics of market growth and decline.¹⁶³ While there were exceptions, such as Gunnar Myrdal's study of cumulative causation during the 1940s and 1950s, most economists resisted study of positive feedback mechanisms, in part because they were not susceptible to mathematical representation, and in part because the very concept of increasing-returns presupposed multiple possible outcomes. With multiple outcomes, there was no possibility of predicting the future behaviour of systems. For most of the 20th

century, economists have struggled to construct a discipline capable of meeting a basic requirement of science, namely the capacity to predict the future behaviour of systems within their domain of study. To meet this requirement, practitioners have constructed static formulations that assume the system under analysis is in a state of equilibrium. The rules governing relations between an economy's constituent parts are seen as fixed, meaning that a system can only proceed to a single outcome, and that future prices of commodities and market share between firms can be determined in advance.¹⁶⁴

With these assumptions in hand, neo-classical economists constructed an economics of *diminishing returns*, a construct in which relations between a system's constituent parts were fixed, and participating firms were capable of only so much expansion before facing rising costs or diminishing profits. Take the example of a coffee plantation. Its place in such a market is fixed by a combination of environmental and systemic constraints, ones that set a threshold on the plantation's expansion. In a market populated by numerous competitors, the plantation only has so much land at its disposal. Other choice lands have already been occupied by neighbouring plantations. Within the lands at its disposal, the plantation can only expand so far to attain its maximum profit. If it passes this threshold, it will eventually begin incorporating land less suitable for cultivation, and expenses will rise at a rate more rapid than revenue, reducing the plantation's profit margin, and its chances of gaining the maximum profit from the resources at its disposal. In such a scenario, the plantation experiences diminishing-returns, and there is no breaking out of the discipline set by the

system's constraints. The plantation does not enjoy the luxury of raising prices to restore its profit margins. Its competitors sell an equivalent product, and there are enough of them that the plantation will simply lose business if it raises prices. In such a market, the plantation is characterised as being in *perfect competition* with its counterparts. It does not enjoy a predominant share of the market, nor can it ever aspire to attain it. And given that it operates in a market with a large number of competitors, the price it charges for coffee will never exceed its costs except by a minimal amount. Its profit margins will always be small.¹⁶⁵

While economists found the assumptions associated with the economics of diminishing returns congenial, since they facilitated prediction of the future behaviour of firms and market price, Arthur notes they suffered from a notable defect: "Such an agreeable picture often does violence to reality."¹⁶⁶ Neo-classical economics did not acknowledge that systems grow and evolve over time. Accordingly, a growing number of economists since the mid-1980s have devoted themselves to the economics of increasing-returns. Much of the credit for this development rests with Arthur, who in the early 1980s contributed to the development of the mathematics necessary to represent systems governed by increasing returns. In the interim, the concept of increasing-returns has enjoyed growing acceptance in sub-disciplines of economics devoted to the study of international trade theory, the economics of technology and industrial organisation, and economic development.¹⁶⁷

Arthur's economics can be reduced to a conception of a market where its agents or products enjoy a measure of success that is self-reinforcing, and self-

sustaining.¹⁶⁸ The market for operating systems in personal computers is a recent example of a system governed by increasing-returns, an example that Arthur refers to repeatedly in his writings. During the 1980s, three products vied for market share, the DOS operating system, CP/M, and Apple's MacIntosh system. While it was unclear at the start of the decade which if any system would attain market dominance, Arthur contends that the defining moment in the market's history occurred shortly after 1980, when IBM concluded a deal with Microsoft to develop an operating system for its PC. Due to its introduction of the personal computer, IBM dominated the initial home and business markets for small computers, a development that Arthur contends initiated a process of cumulative causation. Software developers such as Lotus acquired an incentive to develop products using a DOS platform, since more and more of their customers were purchasing computers serviced by DOS. Customers in turn selected DOS since it supported more software, which then induced software companies to develop a prominent, if not exclusive orientation toward DOS when developing new products. Microsoft's operating system emerged as the dominant product of the 1980s due to increasing-returns, or positive feedback.¹⁶⁹

Aside from positive feedback, markets governed by increasing-returns display a number of other characteristics, including path dependence, a process in which a market's selection of a firm or product is in part determined by contingent, historic, events. Envision a scenario in which several firms enter the market and begin competing with one another. A chance encounter with a buyer, a managerial choice, or an unexpected order can provide a firm, say Firm A, with

an initial edge, enabling it to enjoy the benefit of increasing returns until it enjoys market dominance. Firm B, by contrast, has to endure the misfortune of experiencing increasing-returns in reverse. Cumulative causation will erode its market share.¹⁷⁰

A third characteristic of systems governed by increasing-returns is market lock-in. Once the market selects a firm, it generally remains dominant until a firm bearing a new generation of technology emerges to supplant it. American firms learned this lesson the hard way between 1970 and 1987, as they saw their share of the U.S. television and telephone markets plummet in the face of Japanese competitors. While retrieval of market share is not a hopeless proposition, Arthur notes "the rules of positive feedback imply that it is much harder to recoup a market than to hold on to it in the first place."¹⁷¹

The reason market lock-in occurs is essentially two-fold. The first reason is that some industries enjoy falling unit costs as business increases, a characteristic that enables one firm, or a select few, to take advantage of positive feedback from the economy to corner the respective market. The situation in this context is completely different from the one faced by the coffee plantation in our earlier example. Firms in an increasing-returns market do not face environmental or other constraints that reduce their profit margin over a certain threshold of activity. Instead, they operate in conditions that are the exact reverse. The more they produce, the lower the unit cost, and the higher their profit margin. Arthur again points to Microsoft to illustrate this point. The company enjoyed the effects of lock-in in part because the first copy of Windows cost \$50 Million to produce,

the second \$3. Each copy produced and sold thereafter reduced unit cost and raised its profit margin. The company had every incentive to sell as many copies of its operating system as it could. Due to the reinforcement of increasing-returns, Microsoft emerged again as a dominant player, locking in the operating system market, and making substantial profits while doing so.¹⁷²

The second reason lock-in occurs is due to two market effects identified by Arthur that can be identified with the governance of formal and final cause. According to Arthur, the high-tech market generally favours the establishment of a market standard in operating systems and computer languages. Fewer standards benefit the customer, insofar as a lower number affords access to a higher quantity of software. Fewer standards benefit the producer, insofar as it widens the base of potential customers. In the discipline of economics, the selection of a product by a community of users with a vested interest in uniformity is referred to as a "network effect."¹⁷³

As Arthur describes it, the effect can be identified with formal and final cause, since a consumer's selection of the product is predicated not only on the basis of personal preference, but also on the basis of belonging to a network. The network's community of users favours selection of an ubiquitous standard in operating systems or software, due to a common schema that suggests the network's behavioural competence will be heightened if it does so. More members will be attracted. More software will be developed to meet the needs of its members. And in so doing, the formal integrity of the network is enhanced. With an array of products to service their needs, the network's members have no

reason to abandon the software or operating system that precipitated the network's emergence in the first place.

The final characteristic of systems governed by increasing-returns is that they can proceed toward multiple possible outcomes. The outcome that is selected is determined by contingent events that transpire as the system unfolds. We will learn more about this feature in Chapter Five. There, as we shall see, knowledge of this characteristic will prove useful for understanding Innis' position on the historic role communication technology has played in determining a culture's bias towards constructs of change, emphasising either the dimension of space, or alternately that of time. In this chapter, however, we will concentrate on one consequent of this characteristic highlighted by Arthur, namely that the products selected by the market are not always the best or most efficient. Arthur points to the rise of the DOS operating system again as an example. Derided by computer professionals, it nevertheless attained market dominance, despite the availability of the Mac operating system, which was easier to use.¹⁷⁴

Arthur's work, therefore, translates the theory of *complex adaptive systems* into a dynamic displaying increasing-returns, historical path dependence, and multiple potential market outcomes, features associated with the property of positive feedback. Arthur's work also highlights the role of formal and final cause, through reference to market lock-in. If Innis' narratives are informed by the economics of increasing-returns, we should see some or all of these features in his various treatments of the cod fisheries. Let us see if this is so while examining "The Rise and Fall of the Spanish Fishery in Newfoundland."

II

Innis' interest in the Spanish fishery was piqued by its failure. Rich in specie, and in need of fish to supply a palate governed in part by Mediterranean culture, and in part by the church, Spain had every incentive to develop a thriving fishing and shipping industry, especially to forestall loss of its specie reserve. In Innis' parlance, Spain was the "flip side" of Britain's and France's success in the North American fishery.¹⁷⁵

Innis' account in "The Spanish Fishery" begins in 1540. Despite the discovery of the Newfoundland fishery in the 16th century, Spain's interest in the region emerged comparatively late compared to France and England, countries that sent expeditions in the century's first decade. Still, by 1560 Spain had established a sizeable presence in the coastal fishery off Newfoundland. Between 1570 and 1580, the size of the industry peaked.¹⁷⁶

Why did Spain fare so poorly? Why did San Sebastian, the main Spanish port concerned with the Newfoundland fishery and international trade, emerge as the poor cousin of Saint-Jean-de-Luz, the port in the neighbouring French province of Labourd? Innis' narrative suggests three fundamental reasons relating to: the schema of Spain's fishing industry and government, or final cause; contingent circumstance and the onset of increasing returns; and the emergence of the North Atlantic economy and the governance of formal cause. There is no hint of geographic determinism, no suggestion for example that England's proximity to Newfoundland made its dominance in the North Atlantic fishery inevitable.

Instead, Innis argued that the Spanish fishing industry entered the Newfoundland fishery with a schema that precluded the establishment of a permanent presence along the east coast of North America. In so doing, the industry also precluded the establishment of settlements and trading networks with Spain, constituents that would have supported a Spanish fishery and shipping industry. Spanish fishermen entered the fishery with the object of meeting the demands of their home market, employing methods that had served them in the Irish fishery.¹⁷⁷ Spanish consumers preferred larger fish from the "Green fishery," fresh fish that were shipped to Spain using salt as a preservative agent. The Spanish industry, at least initially, had access to plentiful supplies.

Britain, by contrast, did not, and was forced to harvest smaller fish from Newfoundland that were suitable for the "dry fishery". Given their shortage of salt, British fishing vessels of necessity had to dry their fish along the Newfoundland shoreline as a means of preservation, and therefore had an incentive to construct the necessary infrastructure to support their efforts. The Spanish, with cheap supplies of salt and a market favouring larger fish, did not. England's shortage of salt led it to Newfoundland, laying the basis for settlement, trade, and expansion, an expansion precipitated by increasing-returns. Spain's preference for large fish and access to cheap salt kept it away. In Innis' mind, if the Spanish palate had been different, Spain's economic history might also have been different. The contingency of taste had a direct bearing on the trajectory of Spain's economy.¹⁷⁸

While the Spanish fishery did not provide a basis for Spanish expansion into North America, Innis' account suggests it might have remained a viable entity if the Spanish government had left it alone. The fishery declined in large part because the Spanish government approached the international economy with a schema ill-equipped to ensure the industry's survival. San Sebastian's problems with the fishery were compounded in two ways by the state: by naval impressment and commandeering of fishing vessels, a constant drain on the size of the Spanish shipping fleet; and by economic regulation, which undercut the port's position as a trading centre. Aside from making demands on the assets of the fishery, the Spanish navy also undercut the fleet by issuing orders forbidding its departure for Newfoundland without benefit of naval protection, delaying and thereby limiting its access to the fishery. After the Armada, the navy was unable to provide protection, raising the vulnerability of Spanish ships to attack by English and French ships. Spanish vessels were impounded in French ports with little fear of retribution.¹⁷⁹

For Innis, however, economic regulation proved to be the greater impediment of the two. Regulations were instituted in 1567 prohibiting foreign ships from carrying goods out of Spanish ports. By 1577 San Sebastian was forwarding petitions to the capital protesting the strictures on trade. Foreign vessels were shifting their trade to Saint-Jean-de-Luz, while small Spanish vessels were proceeding to French ports to procure goods. The port's position was further undercut when a royal tax was imposed on woolen goods.¹⁸⁰ Merchants in Aragon and Navarra sent their products to France to avoid the tax, and foreign

vessels were able to take advantage of the altered terms of trade and acquire wool as a return cargo. Merchants in San Sebastian, and the surrounding province of Guipuzcoa, were forced to procure provisions and trade in Saint-Jean-de-Luz, a necessity since the region was unable to produce its own foodstuffs.¹⁸¹

Spain's fundamental problem, according to Innis, was its inability to adjust to the demands of an emerging international economy. Vested interests, whether the ship-building industry in Renteria, or competing ports other than San Sebastian, believed Spain's economic power sufficiently potent that the international economy could be manipulated to meet Spanish designs. Representations to Madrid by these industries argued that continuation of the 1567 system of regulations would enable Spain to undercut the viability of competing mercantile systems, thereby giving Spain a monopoly over the carrying trade.

Spain's central government, seeing a dichotomy of interest between the country's ship-building and carrying interests, consistently ruled in favour of the former. Anxious to retain existing sources of revenue and the integrity of the country's mercantile system, it even responded favourably to Renteria's petition for enhancement of the regulations in 1578, by prohibiting Spaniards from sailing in foreign ships, and foreigners from sailing in Spanish ships.¹⁸² All in all, Spain in Innis' eyes employed a maladaptive schema in its interaction with the emerging North Atlantic economy:

The effectiveness of political power in checking economic activity was an outstanding feature in the

problems of the fishery. The strong political power contributed to the decline of the fishery and suggested a striking contrast to the strength of economic power in England and in New England. The British Empire became possible with the overriding of political power by economic power, but Spain as illustrated in the fishery was limited by the overwhelming strength of political control. The position of Guipuzcoa contrasted strikingly with that of the west country in England. Elasticity was a characteristic of the northern countries in its fishing and contrasted with the rigidity of central control in Spain.¹⁸³

Belief that the economy was susceptible to control by one agent -- the state -- ultimately proved Spain's undoing, and its fishery and carrying trade fell prey to the phenomena of increasing returns, albeit in a way that favoured France:

The effects were cumulative. Shipbuilding in Spain declined with trade in San Sebastian and increased in France with trade in French ports. Moreover, the French in retaliation forbade Spanish ships to load in their harbours and consequently injured Spanish shipping and trade. The cost of shipbuilding was increased with the decline of trade; and cordage, tar, rigging, elm, and supplies for boatbuilding imported from foreigners had increased in cost by one-third. From the standpoint of the government it was pointed out that the royal taxes on wool had declined, provisions for the fleet had increased in price, and ships and seamen were on the decline.¹⁸⁴

While the Spanish government took steps to reverse the decline of the fishing and carrying trades, its efforts according to Innis were never consistent, and never enough to dislodge trading patterns already in place. When it did act, the government employed methods poorly suited to the fishing industry. In the

1620s, the authorities in Madrid attempted to revive the Guipuzcoa and Biscay fishing industries. A large company -- a monopoly -- was proposed, in line with those governing Spain's trade with the East Indies. It proved a failure.

Monopolies never fared well in the fishing industry according to Innis.¹⁸⁵

Between 1636 and 1640 the government attempted to stimulate the industry through reduction in taxes and exemption of fishing vessels from naval commandeering.¹⁸⁶ These measures were ineffective, however, in the face of a 1631 salt tax that effectively killed the fishing industry. In the wake of the tax, the province of Guipuzcoa failed to send fishermen to Newfoundland, for the first time since 1540. The French industry, by contrast, thrived given its continued access to cheap salt. The commercial trade and iron industry also collapsed: "Freedom of trade in salt had been the life blood of the provinces."¹⁸⁷

French Basques and English interests displaced the Spanish fishing industry: "The importance of the fishery as a supply for seamen, as a source for provisions of the poor, and as a basis of trade was no longer in evidence."¹⁸⁸ In Innis's account, a phenomenon akin to economic lock-in had set in:

The fishery had declined too far and the obstacles to its development were too serious for recovery to follow minor measures of this character. Indeed, with the shift of the fishery to Saint-Jean-de-Luz there is considerable evidence to show that capital followed labour and that residents of San Sebastian were engaged in supplying capital to masters of Saint-Jean-de-Luz.¹⁸⁹

Innis' account also suggests that the onset of lock-in was precipitated by more than increasing-returns. It was also stimulated by the intervention of the San Sebastian capital market, an intervention similar in form to the "network effect" described by Arthur. As Spain's fishing industry declined, a network of agents emerged with an interest in maintaining the dominance of one product -- French fish -- over another, Spanish fish. Making handsome profits from loans garnering 26 to 28 percent interest on loans of 100 to 200 ducats, lenders in San Sebastian consistently opposed regulations that would harm the French industry: "Vested interests were created which favoured a continuation of the fishery from Saint-Jean-de-Luz and were opposed to measures which threatened its position."¹⁹⁰

The onset of lock-in, or formal cause, also produced a market outcome that was not optimal. In the wake of Spain's final effort to re-ignite its fishery from 1639 to 1642, a fleet of six ships was sent to Newfoundland in 1643. Its returns were not commensurate with that of the early Spanish fishery. The French, by contrast, "continued to carry out of the country 400,000 ducats of silver and the English to take their profits."¹⁹¹

Labort with its annual fleet of sixty ships and three thousand seamen had captured the Spanish market. The commandeering of Spanish ships and the impressment of sailors was held responsible for the decline. . . .The small dry and relatively poor quality fish of the English had displaced the excellent fish of the banks caught by the Spanish.¹⁹²

The main text of Innis' article, therefore, presents the readers with three characteristics of the economic system described by Arthur: historical path

dependence, increasing-returns, and lock-in. We have also seen that Spain came out on the short end of these processes, in part because the schema of its agents, be it the government, or be it Spain's merchants, were ill-equipped for the challenges of the North American economy. The concluding section of Innis' article can also be reconciled with Arthur's economics, and it is there that Innis makes his greatest appeal to his third reason for the decline of the Spanish fishery, the governance of formal cause. Its message, however, can come across as equivocal to readers unfamiliar with the concepts of increasing returns and final cause.

Innis begins the conclusion by posing a question: which causes were determining as opposed to contributing causes in the decline of the Spanish fishery? Spain's distance from Newfoundland compared to England is cited, but dismissed as it fails to explain Labort's success in France. Other factors, such as the decline of the Spanish navy, and the rise of taxation, which were central in Innis's narrative, are now referred to as "ripples on the surface," rather than "factors determining the main current."¹⁹³ Innis's belief in the North Atlantic fishery's susceptibility to multiple outcomes is suggested by his reference to Spain's wood shortage. A healthy fishery, he argued, could have been constructed on ships purchased from elsewhere.¹⁹⁴

In Innis's mind, the key factor was Guipuzcoa's persistent trade with France and Spain for provisions, despite encroachments on its ancient trading rights by Spain's central authorities. The province was successful in defending its

rights to procure foodstuffs, a demand France and England were happy to fulfill given the rising cost of food engendered by Spain's import of specie.

In Innis's account, a trading network emerged in which Spain's behavioral competence was altered by virtue of its participation in an international economy. The resulting internal organization of the Spanish economy, and its trade links abroad, proved persistent, or in contemporary parlance demonstrated *differential persistence*. The Spanish government proved unable to halt the export of specie or to stimulate exports of Spanish goods. Its efforts proved futile, however, in the face of regulation imposed by the structure of the North Atlantic economy, or the governance of formal cause:

The persistence and increasing importance of the trade carried by the French Basques and later by England and New England to the northern ports of Spain in Newfoundland cod as well as in provisions and supplies are outstanding factors in that period. It was apparent that powerful forces were tending toward an increase in trade which overwhelmed the relative advantages of Spain in the fishery The Newfoundland fishery proved persistent and effective in the transfer of specie to the countries of northern Europe. The importation of gold and silver by Spain raised the prices of commodities; and the relative advantages of the Spanish fishery as compared to the position of Spain as an importer of treasure led to her steady decline in the fishery.¹⁹⁵

Spain, in essence, specialised, an outcome that, as we have seen, was identified by Adam Smith in his references to division of labour.¹⁹⁶ With its economic role constrained by the governance of the North Atlantic economy, and the schema of its agents, Spain's role was reduced to that of financier and

instigator of European economic activity in North America. Its wealth stimulated the "flip side" of French and English activity, with the establishment of New France along the St. Lawrence, the establishment of New England along the east coast, and the subsequent bid of the two powers for hegemony over North America. In "The Economic History of the Maritimes" and *The Cod Fishery*, Innis argued that the cod fishery played a major role in ensuring Britain's success over France, and in stimulating its collapse, with the advent of the American Revolution. For Innis, both studies would reinforce a lesson that he had learned in *The Fur Trade*, and would voice again in his communication studies. The problem of Empire, the problem of imperial survival, was better stated as the problem of increasing-returns.

III

In his two studies, Innis undertook to describe a contest, one in which Britain and France were the combatants, and one in which the prize was hegemony over North America. He also attempted to explain why Britain won the contest, and why, with the collapse of the First British Empire, its victory proved so fleeting. The essence of the matter for Innis was simple. The survival of regimes was dependent upon their ability to adapt to the emergent, temporally dependent variant of change he had identified in *The Fur Trade*. Such had been his message then. Such would also be his message in his future communication studies. In the quest for North America, Innis identified economic activity in his

two major staple studies as the most important manifestation of that change.

Britain adapted. France did not. For Innis, Britain's military victory of necessity had to be grounded on the Empire's economic activity.¹⁹⁷

Innis' purpose also extended to the aftermath of the matter. The emergence of European empires in the 17th and 18th centuries had profoundly transformed the face of North America. Innis' purpose in studying the economic histories of the Maritimes, Newfoundland, and New England was to renew the argument made in *The Fur Trade*. In these regions "the continuous and powerful effects of the underlying technique of industry," technique employed in the cod fishery, had had a direct bearing on the types of structures that had emerged, ones governing "the economic, social and political activities of the communities concerned."¹⁹⁸ Economic activity in Central Canada had produced large centralised structures. Innis sought to demonstrate that on the East Coast it had produced de-centralised structures. Innis' purpose was to once again demonstrate the tenets of the staples hypothesis. And while referring to the emergence, culmination and aftermath of the conflict that structured his histories, Innis aimed to describe a regime of change characterised by emergence, increasing-returns, and the governance of formal and final cause.

Innis' study begins with the discovery of North America in 1497, but the narrative's main thrust begins in 1550 with the emergence of a sustained English presence in the Newfoundland fishery. For Innis, the history of the fishery in the 16th century was marked by two significant trends, the first being the rise of England and France as the fishery's major players. While Portugal and Spain both

sent fleets during the first half of the century, by 1600 both were overshadowed by their northern competitors.¹⁹⁹ The second trend was the geographic distribution of the two fisheries, which Innis argued was a result of their respective specialisations. England specialised in dry fish, and rapidly established a major presence along the Avalon peninsula in Newfoundland. The French fleet specialised in fresh fish, or the green fishery, and concentrated its activities in the bank fishery, located to the south of Newfoundland. It did not establish a major presence on the island.

The issue was important, argued Innis, because the choices each fishery made in the early phases of English and French expansion had a major impact on each empire's subsequent ability to develop a carrying trade. Initial choices would also determine which empire received the benefit of increasing-returns, and subsequent success as an economic and imperial power. According to Innis, the choices each fishery made were related to their respective environments, their internal organisations, and the governance of formal and final cause. In Innis' account, the English fleet entered into the fishery with the disposition to trade, engendered by environmental constraints faced at home. English interest in the Newfoundland fishery was first prompted by Denmark's imposition of licensing fees over the Iceland fishery, England's previous source of supply. The move precipitated a corresponding move of the centre of the industry from the East Coast to England's West Country, a region with ports closer to Newfoundland, such as Plymouth, Southampton, and Poole. Like the Spanish port of San Sebastian, the West Country was an infertile region dependent on trade, and

accordingly it promoted the development of infrastructure to process a wide variety of fish prior to shipping it to foreign markets.²⁰⁰

The second important constraint faced was a shortage of salt. Unlike France and Spain, which had plentiful sources of supply for their fleets, the English industry was forced to procure it through trade, first with Portugal, then with France. Yet even with limited access to supplies of salt, the fishery was forced to rely on alternate forms of preservation. In the Iceland fishery, it had learned to select fish susceptible to drying into a hard cure, a practice it would continue in Newfoundland. Over the long-term, England's constraint worked to its advantage, causing it to specialise in a form of fish highly susceptible to trade, and the benefit of increasing-returns. In the 16th century, it found a ready market for its product in the Mediterranean. In the 17th century, it found a market amongst European powers sailing in the tropics. Sir David Kirke, who for a period of time held a monopoly over the Newfoundland fishery, would note that no power could send ships to the Indies without the dried fish produced in Newfoundland. The final constraint promoting trade was the dwindling size of the English domestic market for fish, a development Innis traced to England's shift from Catholicism to Protestantism.²⁰¹

The French, by contrast, foreswore developing an extensive presence in Newfoundland, and failed to develop a substantial stake in the dry fishery. While the English were aggressive in maintaining their interests, sending large armed ships to harass French and Spanish competitors, the French according to Innis had little reason to challenge English claims. Aside from being outgunned, the

smaller ships of the French fleet specialised in the green fishery; they were in search of larger fish. Consequently, France shifted its fishery from waters adjoining the Avalon peninsula. Its fleets moved either to the north, or to the bank fishery to the south of Newfoundland. Unlike the English, the French had no strong interest in using the fishing fleet as an instrument to promote trade. Consequently, the industry was scattered throughout France, with fishing ports located in the English Channel and the Bay of Biscay, and each port servicing markets with disparate tastes. The Paris market in the north preferred large fish. Basque fishermen provided smaller fish for the south of France.²⁰²

Aside from a strong domestic market, and a specialisation in the green fishery, the French fleet's inclination to engage in trade was attenuated by three factors. It had access to plentiful quantities of salt, and therefore little incentive to develop a specialty in drying fish, a commodity more suitable for trade. Second, the fish it did cure for trade was a poorer product, given the larger size of its catch. Finally, the French industry failed to fully exploit its catch. Its practice was to dispense with the portion of its harvest that did not meet the need of its clientele.²⁰³

According to Innis, the French fishing industry failed to engage foreign markets in large part because it was embedded in a self-sufficient economy. From the standpoint of the industry and from the country as a whole, there was no need to use fish to procure products from abroad, save specie. The decision would have a pronounced effect on the subsequent evolution of the fishery, and would

hamper the state's later efforts to develop a trading network that would integrate its various colonial possessions:

The self-sufficiency of a continental area contrasted strikingly with the essential demands for trade of an island area. The characteristics of France as a self-sufficient area . . . were of fundamental importance to her position as an empire on the Atlantic. A large land area with diversity of resources dependent on wide ranges of climate and other geographical factors tended toward self-sufficiency in contrast with a relatively small island with scarcity of raw materials, an inadequate home market, and essential dependence on trade.²⁰⁴

At base, English fishermen entered the Newfoundland fishery and the 17th century with an inclination to engage in intra-imperial and international trade, while the French did not. Still, in Innis' account both France and England were dominant players by the end of the 16th century. It is in the 17th century that Innis suggests a disparity in their fortunes began to emerge. Three trends in his view shaped the history of the fishery: the struggle by fishing interests to end or prevent monopoly control of the trade; economic diversification; and the emergence of trading networks. England's success in adapting to all three of these trends would put it in a dominant position in North America, militarily and economically, by the middle of the 18th century.

According to Innis, company control of the international economy reached its zenith in the 16th century. Monopoly control of North Atlantic trade, however, was undercut by two simultaneous developments: the emergence of a fishing industry whose sphere of operation extended from Europe to Newfoundland; and

the outbreak of hostilities in Europe, particularly between England and Spain, a conflict that among other things witnessed England's engagement and defeat of the Spanish Armada of 1588. Of the two developments, Innis viewed the emergence of the Newfoundland fishery as the more important, largely because the fishing industry was a trade in which resources could with relative ease be extracted from the environment.²⁰⁵ Its capital costs were much lower than those for the fur trade. More independent agents were able to participate, and the industry in both England and France enjoyed the support of large capital markets²⁰⁶:

In France as in England it demanded the initiative of large numbers carrying on the industry from small vessels. The demands were reflected in aggressive commercialism in contrast with large-scale company organization. It opened a breach in mercantilistic control which was progressively widened.²⁰⁷

The breach was facilitated by the onset of conflict with Spain, a development that hindered the ability of English monopolies to assert and defend their rights. Despite deteriorating relations with Spain, the English government instituted a new regulatory regime with the Spanish Charter of 1577, according monopoly privileges to a select group of English merchants. Despite the prevailing regulations, fishermen and West Country merchants set up a trading network as early as 1581, one linking England, Newfoundland, Spain and the Mediterranean. For England, the results of the contraband trade proved to be immediate, beneficial, and substantial, including "an abundance of shipping, an

outlet for manufactured goods and provisions, a supply of semitropical products and specie, substantial profits, and ideal possibilities for the development of a mercantile policy." ²⁰⁸

According to Innis, even monopoly companies were forced to concede that independent commerce with Spain and Brazil had improved England's economic position. Their position, however, did not preclude the re-institution of the Spanish Charter of 1577 in 1604, after the cessation of hostilities between the two powers. While trading links were formalised in a treaty between England and Spain that same year, freedom of trade in goods such as cloth, grain and fish was not extended. It was only after persistent lobbying by West Country merchants that legislation was passed in 1606 granting merchants free access to Spain, Portugal and France. ²⁰⁹ With some prodding from the fishing industry, England modified its economic policy to reflect newly emergent economic practice:

An expansion of trade because of, and in spite of, both company control and the outbreak of hostilities was largely responsible for a favorable treaty in 1604 The failure of company organization to control West Country trade and the West Country fishing industry led to the substitution of regulation which found an extension in the navigation system. ²¹⁰

The de-regulation of European trade, however, did not end the regulatory challenges faced by the English fishing industry. Repeated, and at times successful, attempts were made to organise the Newfoundland and New England fisheries under monopoly control. The industry's French counterpart faced similar challenges according to Innis during the first half of the 17th century. In the case

of England two monopolies were granted, one to Sir Ferdinando Gorges in 1620, granting him a charter over trade and fishing in New England from the 40th to the 48th degree of latitude. The second monopoly was granted in 1637 to Sir David Kirke, granting him control over trade in Newfoundland. While English ships were to be given freedom of the fishery, Kirke was given the right to tax foreign bottoms, and to impose licensing fees on English ships. According to Innis, Kirke was able to enjoy his monopoly for 14 years, before earning the enmity of the West Country. He made the mistake of asserting his rights too vigorously, thereby offending a powerful lobby. English fishing merchants by virtue of their concentration on the West Country had influence in London, and they used it to secure Kirke's recall. As for Gorges, in Innis' narrative he was able to restrict English access to the New English fishery, but he was unable to stop the region's economic development, which as we shall see was precipitated, in part, by the English fishery.²¹¹

The French fishing industry was also subjected to several attempts to place its fishing grounds under monopoly control. The main impetus for these initiatives was the fur trade. Due to English attacks on French shipping, the French fishery by the 16th century had expanded to the Gulf of St. Lawrence and the Gaspé peninsula. The expansion of the fishery to the Gulf led in turn to the establishment of trading contacts with local Indians, and the development of the fur trade.²¹² By the end of the century, the fur trade had grown to sufficient size that a monopoly over both the fish and fur industries was granted to the *Company of 1599*. By 1607, however, Samuel de Champlain reported Basque and Breton

fishermen were violating the company's rights. While Champlain succeeded in his efforts to rationalise the fur trade in 1620, the fishing industry was never brought under control. A final effort was made by the state in 1627, only to dissolve in the 1630s. As Innis saw it, the French fishing industry never proved susceptible to political control, in part because of English competition, and in part because of the internal structure of the fishing industry.²¹³ Concessions made to French merchants "failed, while in the fur trade monopoly struck deeper root. The atomistic, or small-unit, commercialism of the fishing industry was entrenched in a century of development."²¹⁴ It was a characteristic that enabled the fisheries of both countries to escape control by monopolies imposed by the state:

An industry prosecuted in small vessels subject to limited control, and from European ports scattered over a wide area divided between French and English and between green and dry fishing, conducted on a profit-sharing basis, and selling to different markets was essentially competitive and sharply divisive.²¹⁵

In the case of England, trading regulations shifted from a regime employing company control to one employing the *Navigation Acts*, acts designed to promote British shipping by mandating that British goods be carried in British vessels. According to Innis, the English also resorted to trade treaties, such as the one established between England and Spain in 1604, and the establishment of the colonial system, initiatives designed to establish plantations abroad to produce raw products and consumer goods for the English market. By mid-century, Innis'

portrait suggests England and France had both reached a point where they accepted the desirability, and inevitability, of adapting mercantile economies in which their fishing trades were able to operate relatively unfettered. The North Atlantic, as a result, became populated with agents capable of establishing trading links, legitimate and otherwise, between the Americas, Africa and Europe. For England, the policy would result in the economic diversification and integration of its empire. France's mercantile policy, by contrast, was less successful, in part because its fishing trade did not wish to enter the carrying trade, and in part because the French government, by committing itself to the fur trade upon assuming the governance of New France, hindered that colony's economic diversification.²¹⁶

In the case of England's colonies, Innis writes that economic diversification emerged in Newfoundland despite the best efforts of West Country merchants and English policymakers to stop it. Initial settlement came from two sources, plantation companies, and fishing vessels that deposited surplus crew prior to returning to Europe. The plantation companies were not important contributors to settlement, largely because their initiatives were unsuccessful. Newfoundland's topography would not support a thriving agriculture and timber industry. The companies also failed because they failed to integrate their efforts with the needs of the fishing industry.²¹⁷

From the standpoint of West Country merchants, the failure of the plantation companies was not an unwelcome development, since they correctly foresaw that settlement would lead to the emergence of an indigenous

Newfoundland fishery, one that would threaten their interests. Land for drying fish was at a premium, as was the timber necessary to construct the infrastructure to support the industry on the island. From the standpoint of English merchants, settlers would have an unfair advantage in procuring both resources. Accordingly, to buttress their position English fishing merchants regularly lobbied for and received legislation prohibiting settlement. An Order in Council was issued as late as 1675 affirming a prohibition against settlement and containing provisions encouraging colonists to move elsewhere, particularly New England.²¹⁸

The problem was that the prohibitions were never successful. As Innis was to reiterate in *The Cod Fisheries*, the fishing industry proved notoriously difficult to regulate via legislation, given the small size of fishing vessels, and the relative independence with which fishermen were able to conduct their activities.²¹⁹ As matters stood, the interests of individual fishermen ran counter to those of West Country merchants. Masters routinely brought crews larger than the minimum complement required to operate the vessel in order to have extra hands while fishing in Newfoundland. They were all too happy to deposit crew members who wished to stay, to forego transport costs during the return voyage first to Europe, then England. Men were also left to safeguard equipment.²²⁰

As the number of settlers grew in Newfoundland, economic diversification set in. An indigenous fishery and labour market emerged as byeboatkeepers, Newfoundlanders who had constructed their own fishing vessels, began searching for crews to man them. Labour was also required to service the sack ship industry, ships sent to Newfoundland specifically to purchase fish before

conveying them to Europe. Both markets according to Innis were supported by masters of fishing vessels who, eager to reduce their transport costs, agreed to transport passengers from Europe to Newfoundland in exchange for a fare.²²¹

New England's growth was also stimulated by the fishery. Reports in 1602 and 1603 emerged in Newfoundland and England citing the superior quality of the cod in the Gulf of Maine and New England. The reports prompted not only the presence of the English fishing fleet, but also settlers transported by the fleet, attracted by the region's possibilities for developing an agricultural base. According to Innis, in the aftermath of settlement timber and shipbuilding industries were also developed to support the fishery:

The fishery meant a demand for skilled labor, for carpenters, carvers, blacksmiths, and blockmakers, for ships, boats, and provisions; and supplies for a shipbuilding industry such as iron, rope, rigging, sailcloth, planks, and pulleys.²²²

Those industries emerged in Innis' narrative not only to support the English fishery, but also the region's indigenous fishery. Indeed, by the end of the 17th century the New England fishing industry emerges in Innis' history as the region's most important player, and a formidable competitor to England and France. In the lucrative Spanish market of Bilbao, for example, it was able to market the larger cod found in the Gulf of Maine as an alternate to the French product. Aside from large fish, New England enjoyed the advantage of proximity and year round access to the region's fishery, enabling its fishermen to employ a wider variety of craft to harvest more fish.²²³

While the English government attempted to obstruct economic development in Newfoundland, its mercantile policy enabled it to take a more constructive stance towards its other North American possessions, particularly Virginia and the British West Indies. Seeking to minimize imports of Spanish staples and maximise exports of Spanish specie, England deliberately established colonies to produce staples for home markets currently being serviced by Spain. As early as 1627 Spanish tobacco was excluded from English markets to protect Virginia's nascent tobacco trade. The colony's success prompted expansion into the Caribbean. By 1650 England according to Innis had several islands devoted to the production of tobacco.²²⁴

Spain responded to the loss of its tobacco market by shifting to the sugar trade. Exports of sugar cane were soon being sent from Spain, Madeira, the Azores, and Brazil. After the split of Portugal from Spain, however, English ships became an important part of the carrying trade servicing Brazil, obtaining via treaty in 1642 the right to transport most Brazilian goods. Exposure to the lucrative nature of the sugar trade prompted England to encourage the growth of sugar in its colonies in the West Indies. While shipments of sugar arrived in New England from the West Indies as early as 1639, production did not begin in earnest until the 1650s.²²⁵ By mid-century, England had an array of colonies specialising in different commodities, and could point to trading networks linking it with its colonies and Europe. According to Innis: "By 1650 trade was being carried on with Virginia, Barbados, England, Portugal, Spain, Holland and France."²²⁶

While France, similarly attracted to the sugar market, had established a presence in the West Indies by 1663, it could not point to a similar level of commercial activity among its colonies. From the standpoint of mercantile policy this was a serious problem, since its plantation colonies in the West Indies were incapable of producing foodstuffs sufficient to meet their needs. France could not supply them, according to Innis, and the colonies were turning to New England for provisions. To rectify the situation, Jean-Baptiste Colbert, Louis XIV's Comptroller-General, attempted to establish a trading network linking France's fur, fish and sugar colonies.

While Innis' narrative points to a few shipments of food sent from New France in 1670, Colbert's initiative nevertheless failed for three reasons. To start, Innis suggests the French government was working at cross-purposes with itself. Instead of stimulating the development of economic diversification necessary for trade, the French government upon assuming governance of New France in the 1660s instituted economic policies that precluded such a possibility from ever occurring. Like the governing companies before it, the French government attempted to manage the colony's economy, channelling development to support the fur trade. The policy hindered the development of an agriculture base and shipping industry, and engendered inflation in the 18th century, an inflation that would contribute to the colony's collapse.

The orientation and technique of the French fishing industry further hindered the efforts of Colbert. In Innis' eyes, the French fishing industry provided marginal support at best for France's position in North America. The

problem extended beyond its lack of interest in the carrying trade. New France's position was also undercut by the technique of the fishing industry. The industry had little incentive to stimulate settlement, settlement that might have contributed to the economic development of New France and Acadia, since its vessels required large crews not only for fishing, but also for their operation. Facing lower operating costs than their English counterparts, French shipmasters did not have the same incentive to leave members of their crew in North America. Once they visited the Newfoundland fishery French vessels returned directly to France, unlike English vessels that routinely detoured to Spain and the Mediterranean prior to returning to England. Finally, Colbert's efforts were hindered by weather, according to Innis. New France was not an ice-free port. The West Indies were subject to hurricanes from mid-summer to mid-fall. Weather constraints over each colony limited the trading season between the two colonies to a much shorter duration than that between New England, which enjoyed year round access to the ocean, and the French West Indies.²²⁷

Innis presents us, then, with a scenario in which multiple colonies specialising in commodity production are present in the mid-17th century, and multiple agents are populating the North Atlantic, ones with the capacity to transport goods between settlements along its perimeter. Aside from the historic disposition of the English fishing industry to trade, how did Innis explain the emergence of trading networks in the 17th century? Innis' first explanation was that the English fishing industry structurally, cognitively and environmentally was in a position to benefit from the economics of increasing-returns. In terms of

internal organisation, W. Brian Arthur notes that the question reduces to one of centralisation versus de-centralisation. Industries governed by diminishing-returns require "not just people to carry out production but people to plan and control it, so it favours a hierarchy of bosses and workers Above all it is a world of optimization." ²²⁸ It is also a world of centralised control.

By contrast, companies governed by increasing-returns are more entrepreneurial: "In this milieu, management becomes not production oriented but mission oriented." Hierarchies dissipate in this environment. For employees to locate new opportunities, control must be flattened and distributed, "the deliverers . . . need to be organised like commando units in small teams that report directly to the CEO or to the board. . . . The company's future survival depends upon them." ²²⁹

In Innis' narrative, the orientation of the fishing industry mirrored the mission-oriented one described by Arthur. The reason English fishermen searched for trade, he argued, was that they intuited a basic feature of an increasing-returns economy. The more they engaged in fishing and trading, the more the operating costs of the industry's basic unit of production -- the fishing vessel -- would decrease: "For such cargoes [of lumber and provisions] large numbers of aggressive small owners were ceaselessly in search, either to buy and sell them for profit, or to use them to fill empty holds and cover the costs of outgoing or returning voyagers." ²³⁰

Innis also emphasised that the industry did not function in an environment that imposed an optimal level of activity on each agent, such as pertains in a

diminishing-returns economy. In "The Economic History of the Maritimes" he noted that supplies of fish in the fishery were nearly inexhaustible.²³¹ The industry was not constrained by limits either in supply or demand:

The geographical background, represented by climate, the salt available, the technique of the industry, and the size and abundance of the fish was a stabilizing factor of supply. In tropical countries, demands for a higher protein content in the diet of the people, the difficulties of cold storage, the rigidity of customs and consumers' preferences, and the dominance of Catholicism were stabilizing factors of demand.²³²

Aside from European demand, fish was required to feed European crews heading to the tropics: "The demand for fish was a result of a relatively inelastic demand for specie, and supply responded directly because of the mobility of labor and ships."²³³

The French fur trade, by contrast, did not emerge as a mechanism for the development of a carrying trade in Innis' narrative. Hampered by a finite, fluctuating supply of furs, production concerns were paramount for an industry with a persistent need to construct and maintain infrastructure to support a continental trade, including supply depots, and military fortifications to prevent English incursions on existing sources of supply.²³⁴ Transport costs were also a constant concern for the French fur industry, given its perception that settlement would threaten its supply of furs. It was therefore unable to take advantage of passenger fares to reduce operating costs.²³⁵ With constraints imposed by supply and production costs, it is not surprising that in Innis' account the industry

embraced a structure consistent with an economy governed by diminishing-returns: "The Fur trade . . . was characterized by centralisation of organization whereas the fishing industry has been characterized by decentralisation." ²³⁶

Aside from the presence of agents willing to facilitate commerce, and the presence of an environment capable of supporting increasing-returns, Innis also identified specific commodities as playing a catalytic role in stimulating the emergence of trading networks. Recall from our discussion in Chapter One Stuart Kauffman's belief that autocatalytic sets emerge in environments populated by catalysts, molecules that promote the combination of molecules, and the subsequent emergence of systems that actively interact with their environment.²³⁷ Historically, Innis believed that certain commodities such as salt had played a similar role, instigating trade, expansion and subsequent opportunities for further expansion in England's trading networks in the North Atlantic. Salt and dry fish were among the earliest commodities that performed this function:

England's relative scarcity of salt, her more limited home market, and her concentration of fishing interests in the West Country forced her to depend on areas suited to drying and adjacent to the fishing grounds. She acquired a foothold on Newfoundland for the dry fishery, ... By the end of the century England was established on the Avalon Peninsula. The expansion of the markets for light-salted dry fish enabled her to increasing her shipping, her direct trade in fish, and her indirect trade, by using ships released in the long closed season. . . . Moreover, it meant an expansion of trade, if only because the English fishery depended on solar salt produced in southern continental countries. The demand for cod became a demand for English ships and men. Directly and indirectly the fishing industry hastened the growth of shipping and trade

which followed the decline of Spain and Portugal, and the opening of markets beyond the power of Spain to occupy.²³⁸

As we saw in our section devoted to the Spanish fishery, Innis also saw specie as an early catalyst to trade, providing in Innis' words "a sheet anchor for the commercial activity of the Atlantic basin." Anxious to procure specie since it "increased the liquidity and effectiveness of the commercial organization of the countries which received it," England also desired specie to facilitate its trade with India, specie being the only form of payment it would accept: "The drive for specie in developing trade was evident in the production of commodities of high value and light bulk in the New World ranging from furs to tobacco to sugar."²³⁹

The combination of willing agents, a conducive environment, and the catalytic commodity of sugar led to the emergence of trading networks in North America, networks that supported England's rise to economic dominance. Innis' account suggests New England expansion into the West Indies market was initially prompted by the economic diversification the fishing industry facilitated in the first place. New England had industrial and agricultural products that it wanted to sell, and a fishing industry not only willing to ship them, but also to develop trade ties for the region:

Through the fishery, trade between tropical and north temperate countries or between areas with an absolute advantage in production was stimulated. Specie was added to the temptation of the advantages provided by sugar and salt. . . . Capitalizing the advantages of cheap water transport the relatively small unit of the fishing or the trading ship was a powerful driving force for

trade. Ships managed by individuals were continuously searching for cargo and seeking out new commodities and channels of trade. Cod was the basis for a strong and flexible economy which demanded and provided a wealth of individual initiative.²⁴⁰

The effects of trade between the West Indies and New England were several. Innis reports that the first effect was the onset of increasing-returns, stimulated by the decline in shipping rates effected by the fishing industry. Unlike New France, where the limitations imposed by the fur trade and the government held the economy in stasis, and eventually pushed it into decline, the fishing industry precipitated a second wave of growth:

The problem represented by ships that lacked either outgoing or return cargoes -- bane of the fur trade of New France -- was largely solved. Expanding industry and New England trade with the West Indies were aids to further expansion in the fishing industry and trade with the Mediterranean, Europe, and England. The aggressiveness of New England traders in small ships lowered freight rates and contributed to the development of a trading organization.²⁴¹

Due to the initiative of fishing agents, a trading organisation, or network emerged, one that served "to knit together the diversities of the empire in North America."²⁴² The network also began to demonstrate the governance of formal cause, by regulating the activities of its constituent parts through positive feedback. According to Innis, trade as early as 1647 had begun to induce West Indian plantations to shift from a diversified agriculture to sugar production. A contemporary account provided by Innis noted that: "Men are so intent upon

planting sugar that they had rather buy foode at very deare rates than produce it by labour, so infinite is the profitt of sugar workes after once accomplished." ²⁴³

While producing high profits, trade also had a tragic consequent in Innis' narrative. Recall from our discussion of *complex adaptive systems* that emergent systems will incorporate new constituents from their environment to heighten their formal integrity. The new constituent in this case was slave labour, as demands for cheap labour emerged by the 1670s. Accordingly, Africa in Innis' narrative was incorporated into two trading networks, one linking New England with Africa and the West Indies, the other linking England with the same locales. England sent woolen goods, firearms and iron to Africa in exchange for slaves, who were shipped to the West Indies. Sugar was conveyed on the return voyage to England. New England merchants procured molasses and sugar to make rum, which was shipped to Africa in return for slaves. ²⁴⁴

Participation in the slave trade nevertheless proved a profitable move for New England, since the West Indies required a cheap source of food to feed its slaves. It was a market New England was able to fill due to the region's expansion of its fishing into Nova Scotia after the Treaty of Utrecht in 1713. Due to development of smaller fishing vessels, New England fishermen were able to harvest low-grade fish that were shipped to the West Indies. ²⁴⁵ By the end of the century, then, New England and England in Innis' narrative collectively emerged in Innis' narrative as the beneficiaries of a process initiated by the English fishery at the start of the century, one comprising the onset of economic diversification, the search by agents for trade, the onset of increasing-returns, heightened

specialisation, and additional opportunities to sell fish and trade. It also emerged as the beneficiary of one final attribute of an increasing-returns economy, high profit margins:

The expansion of the New England fishery was chiefly in response to the demands of the British and foreign West Indies. By 1731 this market for oil and refuse fish was held to be bringing sufficient returns to purchase the required rum and molasses, and the salt, provisions, and equipment used in the entire fishery. This left the receipts from the European market as clear profit.²⁴⁶

For Innis, the 18th century emerged as the climax of his narrative. The economic trends that he had traced from their origins in the 16th and 17th centuries culminated in two catastrophic events, the collapse of the French Empire in 1763, and the collapse of the First British Empire in 1783, events he wryly noted as being "of special interest to the constitutional historian."²⁴⁷ In the 18th century as in the 17th, the problem of imperial survival in Innis' narrative was identified with the problem of increasing-returns. Economic growth would support Britain in its competition with France. Economic growth would in turn undercut Britain in its conflict with its colonies. The American Revolution and the institution of a new basis for international North Atlantic trade would be the result.

At the start of the century, however, Innis' narrative suggests New England fishing and carrying interests had little basis for complaint. The region's economy was still enjoying rapid expansion engendered by the sugar trade, an expansion that received further stimulus after the adoption of the plantation system by the British West Indies in the 1730s. By 1748, large plantation owners

had forced most small producers to evacuate to the Dutch West Indies, a rationalisation that reduced the white population of Barbados to 2,551. The move, while undoubtedly hard on the exiled producers, was nevertheless very good for New England, heightening the British West Indies demand not only for fish, but also for lumber, draft horses, oxen, ...and slaves. According to Innis, demand for slaves in particular began to skyrocket, due to the growing exhaustion of soil in British possessions. More hands were required to maintain production levels. In addition to orders from the British West Indies, New England merchants also enjoyed a growing client base in the French West Indies, islands in need of supplies and slaves to expand their production, and, as we have seen, territories unable to procure supplies from France.²⁴⁸

Within that emerging trading relationship lay a catalyst for New England's growth. Within it also lay a constituent to assist England in its competition with France. And within it finally lay a conflict that would culminate in the American Revolution. According to Innis, British sugar interests, angered by growing trade with French competitors, pressed London to impose trade restrictions limiting American commerce to British possessions. The planters complained that American trade with the French colonies reduced the price of British sugar, and raised the price of provisions and shipping, since British planters were forced to bid against French competitors for American goods and services. In pressing their case, Innis argued that British West Indian sugar interests enjoyed a disproportionate influence over the crafting of British legislation, an influence

derived from the industry's recent consolidation, and the structure of its capital market:

The effectiveness of the short-term credit in commercialism based on the fishing industry was in striking contrast to the limitations of long-term credit in the fur trade and in the plantation colonies. Staples demanding long-term credit were dependent on capital control in relation to the metropolitan development of Great Britain. Under these conditions the effectiveness of staples interest was evident in political influence and legislation. With dependence on commercialism as in New England the essentially close relationship between the economic and political institutions of the British Empire disappeared.²⁴⁹

Pressing for the imposition of a closed market, British sugar interests received it in the form of the *Molasses Act* of 1733, which forbade the American colonies from importing products from the French West Indies.²⁵⁰

New England protested the measure, arguing that the new trading regulations robbed the region of a market large enough to absorb American products. The British West Indies were too small, and were similarly incapable of filling American demands for sugar. But according to Innis, the act had little real bearing on the conduct and subsequent growth of New England trade. After the passage of the *Navigation Acts* in the 17th century, New England merchants had routinely engaged in smuggling to escape the strictures of English commercial policy, particularly in Newfoundland where they traded for European goods.²⁵¹ In the case of the West Indies, New England merchants simply ignored the restrictions: "With cheaper foreign sugar, and with the difficulties of enforcing

the act in an area containing numerous islands, cheap water transportation, and relatively small boats, smuggling increased." ²⁵²

Continued access to French sugar, Innis argued, induced a new cycle of increasing-returns. After King George's War, 1744-1748, New England's trading relationship with the French West Indies deepened. In the years preceding the American Revolution, the limitations of British plantations became all too evident. The British West Indies were only able to service the demand of one colony, Rhode Island, and even there British sugar producers only met two thirds of the colony's demands. To grow, the American colonies required French sugar. By trading, the colonies not only sustained their growth, but also facilitated the onset of increasing-returns in the French West Indies, a development that in turn ensured an expanding supply of sugar for New England:

The resulting trade became to an increasing extent a basic part of the economic development of the northern colonies. After the war it became even more important, and when the French settled and developed the previously neutral Windward Islands of Dominica, St. Lucia, St. Vincent, and Tobago, this was made easier by exports from the northern colonies. ²⁵³

From the standpoint of the French Empire, however, New England's support of a French colony in the short-term would militate France's payment of a very high price in the long-term. As Innis understood it, the rivalry between Britain and France in the 18th century was at base a rivalry between economic systems competing for resources. It was this rivalry that mattered. The military conflicts of the mid-18th century merely aligned the continent's political structures

with economic structures already in place.²⁵⁴ Britain's system won because it encouraged, or at least tolerated, interaction between its colonies, and the incorporation of new constituents into its North Atlantic trading networks. By doing so, New England heightened the behavioural competence of its trading network. By adding the French West Indies, New England heightened the British Empire's ability to compete in the fur trade:

Cheap supplies of molasses as a by-product of sugar and lack of a market for rum and molasses in France were valuable aids to English colonial trade. As for New England, she gained from the colonial policies of France and Great Britain both. . . . Having French rum, English competition intensified the difficulties of the French fur trade."²⁵⁵

France undercut itself by limiting imports of French West Indian rum to protect its brandy industry. In so doing, it was reduced to the position of watching its colonies work at cross-purposes with each other, and witnessing the economic decline of New France. According to Innis, France attempted to limit New England's participation in the fur trade through construction of military fortifications in the west. The stratagem, however, combined with the government's attempts to manage the colony's economy, reduced an already declining pool of revenue.²⁵⁶ The government was unable to reverse the trend, and by the time of the Conquest, France had lost the fundamental contest. By 1763, Britain had already gained control of the continent's underlying economic structures, even prior to the Treaty of Paris. In Innis' mind, France failed for two fundamental reasons.

First, its agents lacked the disposition, the schema, to trade. In a collective decision akin to a network effect, French fishermen selected the domestic market, and never chose to reverse their decision, despite Colbert's efforts. Final cause precluded the French industry from exploiting the economics of increasing-returns, and integrating the French Empire:

The Treaty of Utrecht and Treaty of Paris were milestones in the evolution of economic forces in which the geographical characteristics of an island, with its relative dependence on world trade, and the geographical characteristics of a continent, with its relative dependence on self-sufficiency, had become increasingly important.²⁵⁷

In Innis' economic histories, evolution mattered. The second reason for French failure according to Innis was the government's persistent efforts to bolster the fur trade in New France, initiatives that hindered economic diversification, and specifically the emergence of an indigenous shipping industry that might have linked France's disparate colonies. It proved a costly mistake. The state's failure to come to grips with the reality of increasing-returns led to the collapse not only of the French Empire, but also of the *ancien régime*:

The place of the Crown in New France involved the direct link between trade and public finance and the difficulties which accompanied the inflations after 1700 and 1750. The inability of the French Empire to withstand the inroads of English commercialism led to its breakdown. The collapse of the external empire contributed to the internal breakdown in the French Revolution. France failed to link diverse regions, and England was unable to repress the aggressive integration of diverse regions.²⁵⁸

In the case of Britain, Innis argued that the collapse of the First British Empire was occasioned by its inability to contain an increasing-returns economy - "the aggressive integration of diverse regions" -- within the confines of a mercantile economy. According to Innis, the defeat of France brought to a head a fundamental contradiction in Britain's economic policy. It was simultaneously promoting economic liberalisation and commercialism through the *Navigation Acts*, and economic regulation in the *Molasses Act* of 1733. It would also highlight the need to reform the basis of trade in the North Atlantic. Just as commercialism had demonstrated the need to shift from company control of North Atlantic trade to mercantilism, it would also demonstrate the state's inability to restrict trans-oceanic trade within prescribed boundaries, and the need for free trade.²⁵⁹

According to Innis, conflict emerged between Britain and New England almost immediately after the fall of New France. Prior to 1763, the competing needs of Britain's commercial and staple colonies had attained a rough balance in the formulation of British policy. That situation began to change, however, during the peace negotiations prior to the Treaty of Paris. New England's petition for the French sugar colony of Guadeloupe was rejected by Britain, at the behest of the West Indies. After the Treaty of Paris, West Indian sugar interests continued to enjoy a disproportionate influence over the crafting of British legislation. In Innis' narrative, the British government, instead of loosening commercial restraints after the fall of France, began to successively tighten them in a way that favoured its staple colonies in the West Indies and Quebec.²⁶⁰

The process began in 1763 when New England merchants responded to an imitation by Guadeloupe's Governor-General to re-initiate trade ties. New England smuggling in turn led to passage of the *Sugar Act* in 1764, which reinforced the strictures of the *Molasses Act* prohibiting import of foreign sugar cane.²⁶¹ The measure according to Innis provoked alarm throughout the colonies, Massachusetts Governor Francis Bernard noting greater agitation over the legislation than France's taking of Fort William Henry prior to the start of the French-Indian war. Trade with the French West Indies had risen to twice the level that had existed during the passage of the *Molasses Act* of 1733, and in the wake of Britain's acquisition of New France's fur trade, had stimulated another cycle of economic growth.²⁶² To maintain the benefit of increasing-returns, New England needed continued access to French sugar:

The British West Indies could neither consume all the produce of New England nor provide supplies of molasses adequate to the demands of the northern colonies. The total molasses production of the British West Indies would not equal two thirds of the molasses imports of Rhode Island. . . . The market for rum expanded in the fishery, the slave trade, and also in the fur trade on the withdrawal of the French and the penetration of English traders into the interior. The expansion of colonial and West Indian trade involved competition and an increasing dependence of the colonies on the French West Indies. . . .²⁶³

The withdrawal of the French from Cape Breton and the mainland made it harder for New England to obtain her needed supplies of West Indian products and for the French West Indies to obtain continental products. It also demanded, particularly with the expansion of the fishery, an increase of

trade directly with the French West Indies. In the twenty years between the Treaty of Paris and the Treaty of Versailles the trend of the preceding periods was more marked and reached its ultimate conclusion. British colonial policy encouraged the British West Indies by restrictive legislation, widened the market for New England exports, and increased the necessity of depending on the French West Indies for imports. Encouragement to New England, indirectly by assistance to the West Indies and directly by the encouragement of the fishing industry, increased the disproportion between temperate and tropical development within the empire. The lack of political elasticity which made possible the control by the sugar planters conflicted with the demands of an expanding economic structure. Rigidity of control based on sugar production clashed with the divisive commercialism of the fishery. As Pitman has pointed out, the temperate zone of the northern colonies was too large for the small tropical area, whereas with France the tropical area was too large for the small temperate area. The inevitable tendency toward equilibrium produced a lack of political balance which finally broke the control of both first empires.²⁶⁴

It was a conflict that defied resolution, and one that intensified in the 13 years between the Treaty of Paris and the onset of the American Revolution. New England, dependent on continued supplies of sugar to support its expanding trade, continued smuggling, while Britain continued passage of legislation designed to restrict American activity, from the *Townshend Acts* of 1767 to the extension of the East India tea monopoly in 1774, and the *Restraining Act* of 1775.²⁶⁵ In Innis' narrative, Britain failed to realise that it could not contain the increasing-returns economy it had spawned. Its regulation of the sugar market within the British Empire had made the commodity highly profitable, and had stimulated trade

between the British West Indies and New England, a development that stimulated further trade between the American Colonies and the French West Indies. Its attempts to restrict American trade led to revolt, revolution, and the subsequent loss of the American colonies. It also led to the belated recognition that North Atlantic trade would have to be organised on a completely new basis:

The activity of commercialism, which played its part in the disappearance of the colonial system but also had been intensified by it, loosened the powerful forces of competition in the Atlantic basin, and made it inevitable that systems of Imperial control should defeat their own ends.²⁶⁶

If the 18th century was the climax of Innis' narrative, the 19th century was the denouement in which Britain and its colonies, former and current, adjusted themselves to the economic realities imposed by the collapse of the First British Empire, particularly Nova Scotia. Britain, having failed to adapt prior to the Revolution, launched a series of political and economic reforms in the 19th century, including abolition of the slave trade, abolition of preferences favouring the West Indies, free trade in the form of the Corn Laws, and parliamentary reform.²⁶⁷ By mid-century, Britain, according to Innis, had transformed itself, successfully creating a regime and an economic system capable of functioning within the emergent economic structures that linked it with its colonies, and with trading partners outside the Empire, particularly the United States.

Interestingly, Innis credits Nova Scotia with providing much of the impetus that led to Imperial Reform. A significant player in the 19th century North Atlantic economy, Nova Scotia emerges in Innis' narrative as an example of

differential persistence. As a colony, Innis' history suggests it was inclined to maintain the assertive worldview and the institutional makeup it had learned from New England, attributes reinforced by its own participation in the fishery, and attributes that stood it in good stead in its relationship with London, motivating the colony to lobby for legislation that would protect its interests. Governance in the 19th century British empire, at least in the white colonies, became steadily more decentralised, in large part because of the initiative of Nova Scotia. Innis' narrative also suggests that institutionally Nova Scotia retained an ability to adapt. In the face of economic disequilibrium, it self-organised. In the face of an international economic system displaying emergent properties, and the governance of formal and final cause, Nova Scotia made changes that culminated in the advent of responsible government and Confederation.

In the aftermath of the American Revolution, Nova Scotia became the beneficiary of much of New England's trade within the Empire, particularly with the West Indies. Its economy diversified with the rise of lumber and shipbuilding industries, as well as the onset of fishing and agriculture.²⁶⁸ In the economic order that emerged after the Revolution, Nova Scotia's task in Innis' narrative became two-fold, to enhance its trading interests within Britain's colonial system, and to prevent American incursions into its markets, particularly in the Caribbean, and its fishery. Both objectives were pursued by the colony's persistent and successful lobbying of the British government.

Nova Scotian institutions, particularly the Assembly, proved to be vigorous advocates, a stance Innis traced to the colony's ties to New England

political culture, and the ties of both regions to the individualistic ethos of the fishing industry. Innis's description of the history of political and economic institutions of Canada had suggested differential persistence. The fur trade had emerged as a centralised institution, a pattern of behavior that was transferred to Canada's banks, railways and government. A similar dynamic, Innis argued, shaped the behavior and history of Nova Scotian institutions:

[Nova Scotia] assumed a position in the forefront of the struggle for control over legislation dealing with the fishery, partly as a result of her ancestral and New England tradition of assertiveness which was in turn based on the fishery, and partly as a result of the inherent peculiarities of her own fishery. Her position was strengthened because the American Revolution made flexibility imperative, and this enabled her to press successfully for modifications in the British commercial system.²⁶⁹

While successful in protecting its interests, Nova Scotia suffered a severe setback in 1830 when the U.S. and Britain concluded a trade agreement giving the U.S. permanent access to the West Indies. The agreement precipitated a number of important changes in Nova Scotia, chief among them a drive for greater autonomy within the Empire: "The growth of the nationalism in the colonies was the inevitable accompaniment of the British policy of free trade."²⁷⁰

Nova Scotian demands were precipitated by the need to restructure in the face of an American competitor not bound by Britain's colonial system. Given its loss of the West Indies trade, the province pressed Britain to establish free ports to enable the province to establish trading links with new partners. While Britain granted free port status to Halifax and four other ports in 1835, the Nova Scotian

Assembly complained two years later that the Council had degenerated into an advocacy group for Halifax interests. It stood in the way of the expansion of free port status to outlying areas of the province. Increasingly, Nova Scotians became convinced that the province's standing in the international economy would be predicated on internal political and economic reorganization, or responsible government, which Nova Scotia attained in 1848.

The desire for autonomy was also precipitated by Nova Scotia's fishing industry. Its competitiveness was undercut by duties that made its costs higher than American competitors, and prompted the Nova Scotian Assembly to press Britain for powers to repeal differential duties set in Britain, a request that was also granted. Finally, the demand for autonomy was also the result of an increasingly diverse economy, including agriculture, a sector whose importance had increased in the wake of declining trade with the West Indies, and growing trade with Newfoundland. In effect, turbulence engendered by the province's immersion into an international economy, and by Nova Scotia's increasingly complex economy, precipitated reformation, or in the parlance of *complex adaptive systems*, self-organisation:

The position of Nova Scotia, made plain by her external policy, was also evident in her internal development. Agriculture and other interests, working through the Assembly, pressed for expenditures on roads and bridges;. . . Divergence of interests necessitated political adjustment and, in turn, developed the political capacity which became conspicuous in the struggle for responsible government. . . .The varied character of her resources, her proximity to Prince Edward Island, New Brunswick, and the Gulf of St. Lawrence, and

the importance of wooden sailing vessels hastened the growth of various ports, the development of agriculture, the construction of roads, and the expansion of wooden shipbuilding. The centralisation of the commercial group at Halifax was offset by the decentralizing tendencies of trade, fishing, and other industries. The inherited influence of New England, evident in Nova Scotia's commercial spirit, was also evident in the province's political development.²⁷¹

Innis's formulation here is striking. Recall that in *The Fur Trade* the tension between centralisation and decentralisation was a key criterion for Innis in enabling the industry, and later the Canadian state, to adapt to changing economic change. Such a formulation also reflects the requisite conditions for emergence in *complex adaptive systems*. In Innis' narrative, the combination of institutional persistence, occasioned by involvement in the fishery, and the tension between centre and margin allowed for reform. The bifurcation stimulated by its immersion into the international economy affected not only Nova Scotia's internal economy, but also its political and economic links. Confederation in Innis's narrative emerges as a form of self-organization, in which turbulence from the outside induces agents to form a network to increase their behavioral competence, thereby heightening the selective advantage of the totality in the environment. Nova Scotia was looking for just such an arrangement to offset American encroachments into its fishery:

Nova Scotia had early turned to the development of increasingly effective machinery designed to check American encroachments on the fishery and on trade. The necessary defensive measures had called

for an increasing control over governmental machinery, as had been made plain by the successful struggle of the Assembly against the Council, and by the victory which gave the Assembly control over the customs revenues in the forties. The mechanism had in the end involved a realignment of the British colonial system, cooperation with other provinces, reciprocity, Confederation, and the Treaty of Washington. The success of Nova Scotia, when supported by Canada, coincided with the part played by New England in erecting American tariff barriers. For Newfoundland, the struggle against France, the United States, Nova Scotia, and Canada meant isolation; and for Nova Scotia, the struggle against New England, France, and Newfoundland meant Confederation.²⁷²

As a colony and as a province, then, Nova Scotia in Innis' mind displayed great acumen during the 19th century in adapting to the changing conditions of the North Atlantic economy. In *The Cod Fisheries*, Innis portrayed Britain as demonstrating a similar judiciousness in the 16th and 17th centuries. In the centuries preceding the American Revolution, Britain by and large had tailored its economic policy to reflect existing economic practice. It did not constrain its agents the way France did in New France. By insisting that the colony's institutions support the fur trade, France in Innis' mind foreclosed the possibility of economic growth and diversification. Increasing-returns could not be stimulated internally nor externally. Despite the best efforts of Colbert, the French industry proved immune to government entreaties to facilitate commerce between its colonies. By virtue of its history, by virtue of the governance of formal cause, and by virtue of the onset of a network effect, the French industry retained its orientation toward the French domestic market.

By the 18th century, France possessed a trading network with capabilities that could not match those of Britain's. It lost the contest because Britain brought to bear a trading network incorporating trading partners, including some from the French Empire. Harnessing the capabilities of their various trading networks, the British in Innis' construct saw their profits in the fur trade rise, while those of France dwindled. France was reduced to experiencing the onset of increasing-returns set in reverse.

Having finally attained hegemony over North America, *The Cod Fisheries* suggests the British then abandoned the prudent economic policies that had thus far distinguished them, instituting policies designed to channel economic activity, instead of simply reflect it. Seeking to constrain the economic activity of its North American colonies, Britain in turn lost them. For Britain, as for France, the problem of Imperial survival was reduced in Innis' narrative to resolution of a much simpler question: how well did each regime manage the onset of increasing-returns? In Innis' mind, the answer was not very well. In a contest in which the prize was hegemony over North America, both ultimately lost.

IV

With our reading of Innis' four histories completed, we are now in a better position to assess how well they cohere with Mel Watkins' theory of staple development. Stated simply, the answer is not very well. While Watkins is

correct to assert that Innis' writings suggest Canada historically has been caught in a "staples trap," his appeal to dependency theory to explain Canada's specialisation does not cohere with what Innis had to say. While Innis does suggest that France played a constraining role in New France's development, he does not make such a claim for Canada's subsequent development. Instead, as we saw in our study of *The Fur Trade*, Innis suggests Canada's specialisation in staples was the product of increasing-returns, and the governance of formal cause. Contrary to the suggestion by Watkins and others, Innis did not see Canada's economy operating under governing rules that differed in their fundamentals from those governing the European centre. As we saw in Innis' history of the Spanish fishery, and *The Fur Trade*, both France and Spain were subjected to the governance of formal cause in his model, and the outcome of that governance was often at variance with that desired by contemporaries of the time. Spain desired a strong fishery and carrying industry. It got neither.

Innis' writings also suggest a much more complex portrait of the Imperial centre than that provided by Watkins, whose portraits construe the centre as a single actor. But that is not the picture that Innis drew. As we saw, in his treatment of the 17th century Innis suggests Colbert attempted to link France's North American colonies using the French fishery. Due to the industry's adaptation to the French market, however, French fishermen had little incentive to respond to Colbert's encouragement. Formal and final cause precluded the emergence of a French carrying trade, and there was little Colbert could do to reverse the network effect already in place. Stated simply, Innis' histories suggest

that Imperial centres enjoyed neither the unity in identity, nor the absolute sovereignty over economic development suggested by Watkins.

His writings do not even suggest that the state proceeded as a unified actor. Colbert wished to create a commercial economy to unite France's North Atlantic possessions, yet French policy toward New France hindered the economic development that would have made commercialism possible. England in the 17th and 18th centuries alternately desired the security of a mercantile economy and the robust growth of a commercial economy. Its failure in the 18th century to realise that it could not have both led to the American Revolution.

Watkins' theory also suggests a normative theory of development, but again Innis' writings suggest a different interpretation of Canadian economic history. William Christian correctly observes that Innis in his staple histories repeatedly emphasised the importance of human purpose in Canada's economic development.²⁷³ Innis emphasised two points. First, in trading relationships in which participants were locked into a staples economy, their selection of commodities for trade was in effect a network effect. Staple producers in the West Indies, British North America, and Canada participated because they chose to, because they received positive feedback in the form of profits, and because the Imperial centre responded to their needs in the form of capital and legislation. In British possessions, the economic relationship between centre and margin characterised by Innis was one of interaction, not coercion.

Second, Innis' writings do not suggest economic development is pre-determined by environmental constraints or constraints imposed by extracting

commodities from the environment. Rather, the constraints were cultural, and numerical. New France's failure to become a commercial economy rested on choices made by the regime and the French fishing industry. The importance of final cause is suggested by the different trajectories of the New French and British North American economies in Innis' narrative. After the collapse of company control in New France, the French government opted for government control instead of commercialism, heightening the colony's dependence on the fur trade, with disastrous results. Britain, by contrast, opted for a commercial economy, which led to economic diversification, the rise of a carrying industry, and trade with the West Indies. The environment for each economic unit was very similar. Both faced New England as a competitor. Both operated as mercantile systems separate from New England.

The point of difference was the way each actor chose to interact with the immediate environment. In the first, New France produced a specialised economy, and remained dependent on New England for trade. In the second, Canada produced a diversified economy, and competed with New England for trade: "Where the French Empire had failed to link up the fur trade on the St. Lawrence, the fishing industry of the Maritimes, and the sugar plantations of the West Indies, Canada, with an agricultural base on the St. Lawrence was successful." ²⁷⁴

Canada's economic diversification was not hindered by its extraction of staples. Like any other economic region, Canada's development was limited instead by the number of agents within it, a point Innis emphasised by appealing

to increasing-returns, and by appealing to Smith's dictum that the power of exchange gives occasion to the division of labour. Innis also emphasised that commercial relations had the power to disrupt centre-margin relations, a contention that differs from interpreters such as Daniel Drache, who have appealed to Innis to suggest trade heightened Canada's dependency. In *The Cod Fisheries*, region after region, despite efforts by interested merchants and state authorities to preserve the status quo, attained economic autonomy from the directives of a neighbouring metropole as a result of a rising population of agents, economic diversification, and trade:

The industry's intensely competitive nature increased the importance of recognizing and taking advantage of geographical conditions. . . . As the merchants and fishing ships of the West Country broke the control of the companies in Newfoundland, the merchants and fishermen of New England had an outstanding part in breaking the control of Great Britain in North America. So, too, Nova Scotia became independent of New England; and Newfoundland began to develop along more independent lines and also to develop a trading organization. The influence of the commercialism of the colonies and the Atlantic made itself felt in the breakup of the old empire and in the appearance in 1776 of Adam Smith's *Wealth of Nations*.²⁷⁵

Innis presents us with a picture, then, of economic change that is based on historical contingency, and the actions of multiple agents, not a single Imperial centre. It is also a picture in which systems display emergent properties, and the governance of formal and final cause. Given this realisation, there are grounds to suggest that from the standpoint of North Atlantic historiography, Innis can be

construed as a pioneer of concepts that today are enjoying renewed currency among historians in Canada and abroad. While Canadian historians may have legitimate grounds for concern about the execution of his studies, and more specifically question whether the evidence he provides supports the conclusions he offers, they still have grounds to recommend him. Innis emerges as one of the first economic historians to attempt to understand the history of the North Atlantic economy in terms of emergent properties, and the governance of formal and final cause. Joel Mokyr notes that "such 'autocatalytic models' which viewed economic history as a disequilibrium process once were shunned by the neoclassical cliometric orthodoxy. Today . . . we are getting used to them, and the intellectual gains are substantial."²⁷⁶ Mokyr's sentiment is doubtless one that Innis would have shared.

With the completion of *The Cod Fisheries*, Innis effectively ended the phase of his career devoted to Canada's economic history. After 20 years of writing about the catastrophes, opportunities, and contingencies of Canada's economic past, a catastrophic event impinged on Innis' and Canada's present, namely World War II. The war irrevocably changed the focus of Innis' research in the final decade of his life. Instead of economic systems, Innis shifted his focus to the vastly more daunting subject of culture. Instead of staples, Innis turned his attention to communication technologies. He did so because he believed the regime of change he had studied for the past 20 years would do much to explain why Western culture had collapsed in the first half of the 20th century. In the process of identifying the constituents of a healthy culture, Innis believed

social scientists had to learn how and where society was governed by the regime of emergent change that he had studied as an economist. In *Political Economy in the Modern State*, Innis would attempt to persuade his colleagues that cultures were governed by the same regime of change he had witnessed in economic systems. They too displayed emergent properties, and were governed by the principles of formal and final cause. Innis would also argue that the quantity of information was the control parameter that helped or hindered a society's ability to adapt to its changing environment. Let us see how.

Chapter Four: *Political Economy in the Modern State*

In 1946 Innis completed *Political Economy in the Modern State*. The work in many ways was a marked departure for him, both in the form and the content of the study. In contrast to the monograph format that had characterised his economic histories, Innis presented a compilation of articles that he had published in the years prior to and during World War II. He would never again return to the monograph format, nor would he submit studies devoted pre-eminently or exclusively to staples. Instead, Innis shifted his focus to a different topic: communication. He would spend his remaining years describing its fundamental role as a help and a hindrance to cultural growth and development.

Characteristically, Innis never set out in explicit terms his reasons for changing his focus. Consequently, scholars have had little choice but to surmise his motives based on his stated intellectual concerns, and his behaviour given the geopolitical context of the time. The earliest view put forward by colleagues such as Donald Creighton and W.T. Easterbrook was that Innis' switch was a natural outgrowth of his research related to staples. Research into the pulp and paper industries produced an appreciation of the importance first of the newspaper industry, and then of communication media in general, in stimulating economic, cultural and social change. In Carl Berger's words, Innis' research contained an "inner logic."²⁷⁷

Interpreters since the 1970s, however, have been more disposed to credit the traumatic events associated with the Depression and World War II as the precipitating factors. In this line of reasoning, Innis was deeply troubled by the economic orthodoxy that emerged during the Depression, namely the writings of John Maynard Keynes. He disagreed with its central premise -- championed by colleagues in the social sciences -- that society could control the progression of the business cycle through state action, and thereby undo the Depression. He even more violently disagreed with the doctrine's presumed outcome, a scenario in which social scientists worked in collaboration with the state. Innis believed it dangerous to have a society in which individuals of intellectual talent tailored their research agendas to the short-term needs of the state. The duty of social scientists as he understood it was to remain in the university. There they would have the freedom to document the long-term economic, social and cultural trends constraining state and individual activity. In Innis' mind, policymakers needed useful intelligence, not fashionable theories.

When he lost this debate, commentators suggest the loss either alone, or combined with the shock of World War II, prompted Innis to begin a study of the historic role played by communication technology, and the historic role played by institutions with a focus on long-term change. According to Carl Berger, Innis began his research one month after the Fall of France in 1940. By 1945, he had produced a 1000 page manuscript, the unpublished "History of Communication", that served as the basis for his major communication studies, including *Political Economy in the Modern State*.²⁷⁸

The central theme of *Political Economy* is post-war reconstruction, a topic that suggests Berger and others are correct in their assertion that the war and concerns engendered by the Depression motivated Innis to change the direction of his research. The preface of the work reveals, however, that Innis' purpose extended beyond providing a plan for the post-war. Innis' intent was also to provide a jeremiad. From his standpoint, Canada and the West were already inundated with a superfluity of plans devoted to re-construction, and such programs -- in their totality -- constituted a problem, not a solution. Most had "the show of wisdom without the reality."²⁷⁹ Western culture had already collapsed twice in the 20th century, and there was no point in engaging in the task of re-construction yet again if the proposed programs only addressed the symptoms of the problem, and not its root cause: the rise of mass media and new instruments of communication.

In their present state, Innis believed the social sciences were not in a position to provide the public either with insight or remedies for the post-war present. Disciplinary specialisation, he argued, hindered his colleagues from recognising that western society and its constituent systems, be they political, economic, social or cultural, were all governed by a dynamic of emergent change. More importantly, social scientists failed to recognise that these constituent systems, which Innis referred to singly and in their totality as the price system, were displaying signs of distortion, or cultural decline.

Politically, the peoples of North America and Europe had lost their capacity for independent thought. Public opinion in the 20th century had become

overly reactive, nationalistic, and unstable, shifting one way and then another in the face of provocation generated by the news media. The consequences of this development were two-fold in Innis' eyes. First, the international system, which had preserved the peace in the 19th century, collapsed in the face of trade barriers created by governments beholden to their nationalist publics, and the outbreak of World War. The second consequence was a decline in the quality of popular culture.²⁸⁰

Accordingly, Innis proposed in his various essays to provide an analysis that interrelated "patterns of Canadian development with those of the Western world" ²⁸¹ To fulfill his stated task, Innis constructed a three part argument which we will review in this chapter. The first task he set for himself was to provide a full description of cultural change. Aside from gaining a deeper understanding of Innis' philosophy of history, the purpose of this section and those that follow in this chapter and the next will be to demonstrate that Innis' early and late works share an underlying unity.

While most scholars agree that the two periods of Innis' writings are linked, there is little consensus as to how. Various interpreters have prioritised one Innisian concept or another and pressed for their acceptance as the bridge that unites the whole. Several studies have suggested the parallelism rests on Innis' interest in the material properties of media and staples. Innis, it is held, believed the physical properties of both were instrumental in producing either large institutions with an interest in controlling space, or smaller-scale institutions preoccupied with the problems of time.²⁸² Other commentators have emphasised

Innis' interest in cognitive bias and monopolies²⁸³, the underlying forces responsible for the emergence and collapse of empires²⁸⁴, factors mediating centre-periphery relations²⁸⁵, and Innis' liberalism²⁸⁶. As William Buxton and Charles Acland note, the diversity of viewpoints in the literature has provoked some scholars to betray "some degree of bewilderment about [Innis'] actual contribution."²⁸⁷ Paul Heyer has proclaimed Innis' intentions with respect to this question and others as forever beyond recall.²⁸⁸

This study takes a more optimistic stance, in part because many of the links cited above, including the preoccupation with media, cognitive bias, and monopolies, can be identified as constituents of his theory of emergent change, and will be in our next chapter. It is also optimistic because Innis during World War II stated in reasonably accessible fashion his primary concern of the time: "Social scientists who participated in active service in the last war have little excuse for forgetting either the lessons of the war or of the peace. They have no excuse for ignoring the contributions of Adam Smith and his successors as to the significance of division of labour."²⁸⁹ As we observed in the previous chapter, Innis identified Smith's doctrine with the economics of increasing-returns, and emergent change.

The second and third tasks that Innis set for himself in *Political Economy* were in essence elaborations on what he had learned from Adam Smith, and from the onsets of World Wars I and II. The systemic world view he associated with Smith informed his analysis as to why the west had collapsed after the relative peace of the 19th century, an analysis we will explore in the second section of this

chapter. It is here that Innis identified the key variable -- or control parameter -- affecting western cultural development, namely information. In so doing, Innis also provided a searing indictment of the news media, one he would continue for the rest of his life.

In our final section we will review Innis' third task, namely setting an agenda for the social sciences, one he hoped would contribute to the moral and intellectual regeneration of western culture. As we shall see, Innis' agenda included exploring ways to visualise information, based on the belief that new modes of representing information would heighten the west's capacity to perceive emergent change. He also proposed a methodology that he believed would enable social scientists to model the social, economic, and cultural systems that constrained and regulated human activity. Learning their spatial extent, and the factors governing their operation would not only improve cultural development in the present. It would also prevent a recurrence of the trauma of the recent past.

I

Innis based the cultural essays of his study on a template of change that he believed governed western culture, a dynamic he believed it ignored at its peril.²⁹⁰ While the schema informs all the essays in the collection, the patterns were most clearly described in "Political Economy and the Modern State", the remarkable essay that anchors his work, and in "On the Economic Significance of Cultural Factors." To make his case, Innis had to first construct the same vision of

emergent change that had informed his staples studies. It was a task that Innis began by arguing that cultural change was governed by the same tension between freedom and constraint, centralisation and de-centralisation, that had marked the rise of the fur trade, the rise of the North Atlantic economy, and the successive stages in Canada's economic history.

"Political Economy" begins with Innis citing Lord Acton's argument that constraint is the necessary prerequisite to freedom. While the ancients realised the importance of checks to liberty, they were never able to produce a political system with the requisite balance. The vice of Rome, according to Acton, was "that it was both church and state in one. Morality was undistinguished from religion, and politics from morals and in religion, morality, and politics there was only one legislator and one authority."²⁹¹

The classical state failed because it was never able to harmonise its political structure with what Innis deemed to be the natural law of culture. Accordingly much of his effort was devoted to describing the history of political regimes that Innis construed to be in harmony with the natural law, namely Britain, the U.S., and Canada. He also sought to recount the history of European letters, which he believed had brought cognisance of the natural law to the Modern World.

Rome's failure to generate a stable polity led to its collapse, and the emergence of the Church as hegemon. From the standpoint of stability, it was not an improvement since the Roman church was no more inclined to distribute power than the empire had been. Luther broke the monopoly of Catholicism over

the West's religious life, while Calvin broke the link between church and state by asserting the primacy of individual conscience. Calvin's revolution laid the groundwork for the rise of Puritanism in England, the movement with the ideological and institutional clout to arrest the authoritarian tensions of both King and Parliament. Concepts of democratic organisation were transposed from church to state:

Puritanism therefore had its impact on politics in its insistence on agreement through discussion, the separation of church and state, a free state composed of equals paralleling a free church with a democratic form of government. In the struggle between Puritanism and Charles I, the issues were sharply drawn and the King lost his head.²⁹²

According to Innis, British and American constitutional history could subsequently be reduced to first ridding Britain's monarchy of its imperial pretensions, and then the British parliament. The struggle with the British monarch extended from the ascension of Charles II through to the Glorious Revolution of 1688 and the reign of George III. The British parliament's attempt to assert its sole control over the Empire through taxation precipitated first American protest and then American Revolution.

The shock of the revolution precipitated the collapse of the First British Empire, the instigation of badly needed political and social reforms, and the emergence of the de-centralised Second Empire. By the end of the 18th century, both Britain and the United States had emerged as regimes characterised by liberty and constraint, and in a position to contribute to the commerce, and attending stability, that Innis believed had characterised the 19th century:

The revolt of the colonies against the centralizing tendencies of Crown and Parliament brought them face to face with the problem of framing an acceptable organisation in the Constitution. The influence of Milton and Locke . . . [was] . . . carried forward in the philosophy of Jefferson. It favoured decentralisation. Hamilton and the federalists / favoured centralisation. . . .The compromise of balances in the Crown, Courts, Lords, and Commons in Great Britain emphasized by Blackstone and Montesquieu provided the pattern for checks between sources of power in the President, Congress, and the Supreme Court, and the necessity for appeal to the people.²⁹³

For Innis, the establishment of stable political systems had been a decisive benchmark in the history of thought. Political stability had not only provided a safe haven for the general populace, it also had afforded scholars the opportunity to systematically explore the dynamics of cultural change in order to retain that stability, a topic Innis addressed in the second section of "Political Economy". The Scottish school of political economy was the beneficiary of Britain's political, economic, and cultural stability. It articulated the second point that Innis sought to establish regarding the dynamics of culture, that cultures are systems that self-organise, that self-organisation occurs when the right balance between constraint and freedom has been obtained, and that such systems are self-regulating.

Innis based his contention on the economic doctrine of Adam Smith, and his "great concept of society as a whole."²⁹⁴ Relying on the writings of Jacob Viner, Innis argued that Smith was the first to identify a coherent system governing economic phenomena, a system in which "economic phenomena were

manifestations of an underlying order in nature governed by natural forces." As with political systems, "the underlying natural order required for its most beneficent operation a system of natural liberty, and that in the main public regulation and private monopoly were corruptions of that natural order."²⁹⁵ The imperative for constraint came from the writings of Acton:

While "the doctrine of self-reliance and self-denial, which is the foundation of political economy, was written as legibly in the New Testament as in the *Wealth of Nations*, it was not recognized until our age." Scotland became "the land of porridge and political economy."²⁹⁶

While Innis clearly stated the need for balance between freedom and constraint, he did not make explicit the consequent of that balance, namely cultural and economic systems producing needed adaptation through self-organisation. While the point is made implicitly in all the essays devoted to culture, Innis was more forthcoming in a series of letters exchanged with Arthur Cole, a colleague in economic history with whom Innis corresponded regularly during the 1940s, the period in which he wrote his communication studies. Consequently, the series is a valuable resource for interpreting Innis' writings, not only for the subject of emergent change, but also for unearthing the suppositions behind his historical methodology of juxtaposition, and this theory of media. What the communication studies rendered implicit, the Cole correspondence often makes explicit. We will be consulting the series again in this chapter and the next.

In March 1945, Innis continued a written correspondence with Cole on the conditions stimulating the rise of entrepreneurs, an issue which Innis believed had significance not only for economic growth, but also for reviving the cultural vitality of the West. Citing works he had recently read by Achille Loria and Nicholas Timasheff, Innis argued that he was "more and more convinced that we need to know the background which admits of the entrepreneur's emergence and . . . the conditions that will admit of his continuance." Loria had noted the constraining role that law had played in Rome, and political economy in England. Each provided the requisite framework for agents to interact, and for a commercial network to emerge:

Certainly it would appear that the entrepreneur in the commercial field can only flourish in a society committed to plan and that other types of society are more apt to be dominated by naked force, to use the expression of Bertrand Russell. Political Economy like law seems to emerge when force and ethics overlap (Timasheff) and for that reason the entrepreneur can function only under similar conditions.²⁹⁷

Innis would state this point more precisely and clearly in 1952 in a letter to W.T. Easterbrook, a colleague at the Department of Political Economy at the University of Toronto, with whom he corresponded and visited regularly during the last year of his life: "I am not sure that the space time approach is not another way of putting Timasheff's suggestion that law emerges at the point at which force and religion overlap. At this point it would appear that order also appears."

In forwarding the principle of emergence, Innis in his essays also sought to portray societies as self-regulating systems, a point he emphasised while discussing the "architectonic" impact of Adam Smith's *The Wealth of Nations*. According to Innis, Smith's conception of natural order was incorporated by Malthus to explain population growth and decline, a development which in turn influenced Charles Darwin to forward natural selection as the mechanism of change in biological evolution:

Both Wallace and Darwin, who developed the theory of evolution independently, have paid tribute to the crucial position of his work. In a letter to Wallace dated April 6, 1939, Darwin wrote: "I came to the conclusion that selection was the principle of change from the study of domesticated production, and then reading Malthus (October, 1838) I saw at once how to apply the principle."²⁹⁹

Innis' purpose in referring to Malthusian theories of population growth and Darwinian natural selection was to appeal to a conception of change in which a distributed whole regulates the activities of its constituent parts, and even replaces an agent if an alternate will make a greater contribution to the continued existence of the system. As we argued in Chapter Two, the principle of natural selection proved difficult for Darwin and those succeeding him to reconcile with the concept of efficient cause.

His description instead suggests a systemic view of change emphasising a species' secondary or relational properties, and self-organisation. The species forms a system with its surrounding niche, and the distributed whole begins

altering the internal properties of its constituent organisms, selecting those that in turn contribute to the continued integrity of the ecosystem, and eliminating those that do not. While this formulation is not consistent with the principle of efficient cause, it is consistent with the principle of formal cause.³⁰⁰ Innis' description of formal cause in his economic histories, and his identification of Darwin with Smith suggests that he understood this point, and that it was the central point he was trying to make in this section of his argument. Cultures are self-regulating systems governed by formal cause.

The force of Smith's ideas as well as those of the Puritan movement proved cumulative in their influence. They stimulated the 19th century political and social reforms in Britain upon which Innis laid such great stress in *The Cod Fisheries*, including repeal of the mercantile system, legal reform, and the extension of the franchise. Smith's ideas were also extended to the social sciences through Herbert Spencer. The political ideology of Puritanism and the economic tenets of the *Wealth of Nations* "compelled the shift from centralisation to decentralisation in the British Empire."³⁰¹

In addition to the concepts of balance, self-organisation, and self-regulation of systems, Innis sought to establish a fourth property of cultural dynamics, namely that its patterns were not only spatial, but temporal in nature. Moreover, the dynamic of culture was non-linear. It did not proceed along pre-established paths of development. It could not be identified with Newtonian mechanics, and as such in Innis' time it was not susceptible to mathematical

expression. As he would note in "The Economic Significance of Cultural Factors":

The significance of economic history in all this is shown in its concerns with long-run trends and its emphasis on training in a search for patterns rather than mathematical formulae.³⁰²

Innis wrote to Cole in October 1941 of his preference for economic studies stressing "the evolutionary (Spencerian) point of view and to offer a more solid footing than . . . the mathematical mechanistic approach."³⁰³

The long-run patterns of culture in Innis' estimation were characterised not by linear progression but rather by periods of growth, decay, disequilibrium, and subsequent re-organisation. In the "Newspaper in Economic Development" Innis emphasised the importance in economics and economic history of "a change in the concept of time," arguing "that it cannot be regarded as a straight line but as a series of curves depending on technological advances."³⁰⁴

In the essay "Political Economy" Innis emphasised his belief that a similar template of catastrophic change applied to culture. In his mind, the field of political economy took an unfortunate turn after Adam Smith, by shifting its focus from dynamic systems to systems in equilibrium, which were susceptible to mathematical treatment. The emphasis on one segment of economic phenomena ultimately shifted the discipline's conception of nature -- and society -- towards the construct of change typified by Marshall's dictum: "'Natura non facit saltum,' (Nature never proceeds by leaps)."³⁰⁵

Innis countered that civilisation was more properly identified with art. In making this allusion, Innis' purpose was to suggest that both were domains of human activity governed by the interplay between choice and constraint. In defining culture, Innis referred in "Political Economy" to Calvin's two cardinal rules of human society -- self control as the foundation of virtue, self-sacrifice as the condition of the common weal -- as a formulation consistent with his ideal of a culture governed by the right balance between freedom and constraint. His definition of art obtained from Geoffrey Scott, mirrored the tenets of Calvin's philosophy:: "In art, as in life, the chief problem is a right choice in sacrifices. Civilization is the organisation of values."³⁰⁶

The identification of civilization with art had an important implication for Innis. Since it was a system governed by freedom and constraint, it was susceptible to periods of self-organisation, disequilibrium, and subsequent self-organisation:

Toynbee and students of civilization insist that while "nature never proceeds by leaps", civilization proceeds in precisely that fashion. "All spiritual growth takes place by leaps and bounds, both in the individual and . . . in the community (Burckhardt)."³⁰⁷

Innis noted in a 1943 letter to Arthur Cole his "personal interest in public opinion -- particularly the existence of broad plateaus of public opinion and the sharp breaks which occur in it from time to time -- a sort of psychological or cultural approach."³⁰⁸

Culture, therefore, was characterised by periods of instability, and Innis' final task in his description of cultural dynamics was to account for the basis of cultural instability, and its ultimate consequence, changed behavioural competence for participating agents in the system. Innis outlined his views on this subject in Section II of "On the Economic Significance of Cultural Factors," in which he provided a condensed history of the 19th century North Atlantic economy, and Britain's role as a participating agent.

According to Innis, Britain emerged as a force for economic growth for three reasons. It enjoyed the benefits of low overhead costs through cheap maritime transport, a developed industrial base, and a potent source of power, coal. By integrating coal with its industrial technique, Britain enhanced and extended its trading network with North America, emerging as an agent specializing in the conversion of raw materials into finished products for export. Select regions in North America emerged as agents specializing in the export of staples such as timber and cotton.³⁰⁹

While the trading system proved robust, it remained susceptible to constant disturbance, typically effected by changes in transport technology stemming from the industrial revolution and new sources of energy. Innis laid great stress on this point. New transport systems such as the railway had consistently destabilised established trading patterns by altering the spatial extent of the network, overhead costs, and the extent and types of commodities that were exchanged. As the North Atlantic economy went through successive phases of

disequilibrium and self-organisation, the behavioural competence or specialisation of the actors changed. In October 1941 Innis argued to Cole that:

The factor which determines the product is to a very large extent the transport cost. As technological improvements in transportation emerged the production of geographic areas changed. For example the wheat belt moved steadily west and its place was taken by dairying or some other form of agriculture.³¹⁰

For Innis, perception of successive waves of cultural and economic patterns could not be approached solely from the perspective of time:

I have a feeling that geography is important and that it is very easy to forget about it through concentration on prices. We need both if we are to think of a European civilization or at least of the sort that Adam Smith had in mind.³¹¹

This point was especially true when tracking the shifting behavioural competence of agents within the system. One of Innis' complaints with Frederick Jackson Turner's frontier thesis was its oversimplified rendition of economic development. In North American development there was not a single frontier, but rather a succession of frontiers, each one with a specialisation that was a reflection of existing transport rates, and the relative advantage of neighbouring frontiers. The newest frontier generally enjoyed two advantages, new plant, and new technique. It was these advantages that precipitated the westward migration of wheat production.³¹² Britain was not immune to disturbances occasioned by

changes in transportation technology. Innis noted in his essay that "England shifted her fields from arable land to pasture."³¹³

While changes in transport technology precipitated cultural change and disturbance, changing communication systems were more fundamental for Innis in explaining cultural, as opposed to economic change, especially in the area of public opinion. The various essays in *Political Economy in the Modern State* are all devoted to explaining the dramatic, and often traumatic, effect that the emergence of print culture had had on the west, from the religious wars of the 16th century to the First World War. Innis' reason for making this assertion will be addressed in the next section of this chapter. Suffice it to say that for Innis, the means of communication, and the quantity of information in circulation, were fundamental in explaining cultural evolution. He would make perhaps the clearest expression of this point six years later in *The Bias of Communication*:

The disturbances which have characterised a shift from a culture dominated by one form of communication to another culture dominated by another form of communication whether in the campaigns of Alexander, the Thirty Years' War, or the wars of the present century point to the costs of cultural change.³¹⁴

II

Aside from providing a description of social, economic, and cultural change, Innis pressed his colleagues to address what he deemed to be the foremost problem facing the social sciences in the post-war era, namely accounting for the

collapse of Western culture during the first half of the 20th century.³¹⁵ In one of the most passionate essays he ever wrote, "The Problems of Rehabilitation", Innis asked:

Why has a century of comparative peace such as prevailed from the end of the Napoleonic wars to the beginning of the last war been followed by the breakdown of Western Civilization? Why has European civilization turned from persuasion to force or from ballots to bullets?³¹⁶

In the conclusion of the essay, Innis pressed his readers to consider the consequences of failing to address these questions, with a conviction that sprang from his own service in World War I: "Having faced the problem it becomes clear that we must realise how prodigal we have been with young life, our most cherished possession, and how careful we must be with that which has been left to us."³¹⁷

Part of that care in Innis' mind involved training students to recognise the systemic nature of culture, and the role that information played as the critical variable governing the evolution of culture. Recall from our overview of the theory of *complex adaptive systems* that scholars from Chris Langton, Stuart Kauffman, to Alicia Juarrero have all argued that the quantity of one or more control parameters is the factor that determines whether or not a system displays emergent properties. If the measure is too high, the system deteriorates either into flux, or into a state of highly complex, oscillating patterns, that are difficult if not impossible for the viewer to perceive.

Innis made a similar argument with regard to the quantity of information circulating in society. In the "Newspaper in Economic Development" Innis made the argument that the rise of mass media -- particularly the newspaper -- had played a substantial role in governing the ability of national economies to adjust to the demands of the international market, or price system. While the newspaper industry by the 1940s had consolidated into an oligopoly, thereby limiting its impact on the flexibility of the nation's economy, historically the decline of advertising

. . .and of newspaper size and circulation reduces sensitivity to the price system and accentuates inflexibility and rigidity in depression; increase in advertising size and circulation accentuates flexibility and elasticity.³¹⁸

With the control parameter of cultural development identified, Innis proceeded with his narrative of 19th century European history, a narrative that he believed did much to explain why the catastrophic events culminating in World War I had occurred. The narrative also explains the basis of Innis' opposition to economic planning, such as that proposed in Canada by the *League for Social Reconstruction* in the 1930s. In his mind, it was beyond the ken of the state to provide an optimal economy, namely one providing full employment and a just distribution of wealth amongst members of society. Such aspirations failed to consider that social scientists had limited knowledge of contemporary social and economic systems, and thus were in no position to offer policy prescriptions.³¹⁹

More importantly, such aspirations failed to consider that the economy as a system imposed constraints by virtue of formal cause, and that the economy itself was subject to constraint by virtue of its interaction with the environment. As such, the business cycle was not as susceptible to manipulation as many of his colleagues believed. Carl Berger notes that one prominent feature of Innis' economic histories was his portrayal of "human helplessness in the face of brutal limitations imposed by nature and the intervention of blind uncontrollable forces." That being said, Innis' worldview nevertheless left room for individual agency. Berger notes that once "the magnitude and character of deterministic elements" was established one was then able to determine "the margin, invariably narrow, in which men are free to make their own history."³²⁰

Finally, Innis opposed the ambition to implement economic planning because he believed economies and societies were constantly evolving organisms capable of developing in unforeseen and potentially harmful directions.³²¹ As such, there was no predicting how an economy would respond to state action, particularly action uninformed by the requisite data from the social sciences. The dangers of uninformed action were demonstrably clear to Innis in *The Cod Fisheries*. Britain did not predict the emergence of New England's trading network and did not grasp its importance until it was too late. By failing to take into account the economic history of the 16th and 17th centuries, Britain emerged unprepared for the catastrophic events of the 18th century. Its economic policies precipitated the American Revolution and the collapse of the First British Empire.

These concerns, particularly the unpredictable nature of economic and social systems informed Innis' reading of what subsequently transpired in the 19th century. His narrative in *Political Economy* suggests that European and North American cultures at the start of the 19th century were characterised by cultural stability, a product of the west's maintenance of the proper tension between freedom and constraint. It was as optimal a situation as could possibly be obtained. With the collapse of mercantilism and the rise of political, social and economic liberty, Britain and North America became participants in a system that was highly efficient in generating wealth, supporting a rising population and redistributing it, and extending capital equipment and production. The system's emergence enabled the two regions to successfully prosecute two world wars.³²²

The rapid economic growth precipitated by industrialism, and new modes of transportation and power necessitated the emergence of new forms of communication, and therein lay the problem:

The rapid and extensive dissemination of information was essential to the effective placing of labour, capital, raw materials, and finished products. . . .The application of steam power to the production of paper and, in turn, of the newspaper, followed by the telegraph, and the exploitation of human curiosity and its interest in news by advertisers anxious to dispose of their products created efficient channels for the spread of information.³²³

The process became too efficient as new modes of transport and communication stimulated the rise in newspapers, and newspapers in turn stimulated the extension of transport and communication networks.³²⁴ Countries

on both sides of the Atlantic were subjected to an overload of information, a state of imbalance that precluded adaptation, culturally and cognitively. In the "Preface" to *Political Economy in the Modern State* Innis noted "the impact of industrialism on knowledge particularly with the development of electrical transmission has weakened the possibility of a sustained philosophical approach such as characterised the world after Newton."³²⁵

The first essential task is to see and break through the chains of modern civilization which have been created by modern science. Freedom of the press and freedom have been possible largely because they have permitted the production of words on an unprecedented scale and have made them powerless.³²⁶

The only venue left, it seemed, in which words had power was advertising, and as the potency of advertising increased the capacity for critical thought decreased, particularly in the field of politics, where innovations in communication could be correlated with disturbances, and massive swings in public opinion:

It is worth noting that large majorities in political elections accompanied the spread of the newspaper on a large scale in England after the sixties in the last century, and the spread of the radio on this continent. Swings in public opinion are more violent with new inventions in communication, and independent thought is more difficult to sustain.³²⁷

In Innis' view the reason that the patterns of public opinion were characterised by rapid oscillation as opposed to a meta-stable pattern was not only

due to information overload, but also because participating agents were not interacting with each other. Recall from our review of *complex adaptive systems* that such interactions are an essential prelude before any system displays emergent properties, properties that impose a measure of stability on the system's constituent parts. According to Innis, print culture had interfered with profitable discussion -- in public and private -- as early as the 18th century, due to the superficial nature of information being provided by the press:

Scott wrote, "if you are interrupted eternally with these petty avocations, the current of the mind is compelled to flow in shadows, and you lose the deep intensity of thought, which alone can float plans of depth and magnitude. Graham Wallas pointed to the decline of discussion with the spread of machine industry and to the emphasis on information and facts as destructive to the environment for thought."³²⁸

The implication of information overload went beyond the problem of discussion, or of creating conditions amenable for cultural paradigm shifts. As far as Innis was concerned the mass media was responsible for three developments in the western body politic, the first being the rise in public hysteria that had culminated in the violent nationalism prior to World War I. The second was the destabilisation of international politics by the press, to the point that policymakers could not halt the progression towards global conflict. Finally, Innis detected a decline in culture in the 19th century, particularly popular culture. As we have seen, Innis placed a high priority on the ability of social scientists to detect patterns in social phenomena. For him, the appreciation of art demanded a similar

faculty, namely the apprehension of aesthetic form. He feared the public due to the rise of print culture had lost its capacity to perceive the underlying forms that unified concrete phenomena. Stated another way, he feared it had lost its appreciation of the importance of formal cause.

For Innis, the 19th century marked a progression from the reason of the 18th century to the irrationality of the 20th century, characterised by intellectual and public "interest in psychology, advertising, mass propaganda, totalitarian states and war."³²⁹ The rise in mass media suggested for Innis the emergence of a crowd or collective mind, similar to the phenomena highlighted by Gustave Le Bon and other social psychologists during the 1890s.³³⁰ Quoting Edward Lytton Bulwer in "An Economic Approach to English Literature in the Nineteenth Century", Innis noted:

The magic of Gutenberg and Füst hath conjured a wide chasm between the past and future history of mankind: the people of one side of the gulf are not the people of the other; the physical force is no longer separated from the moral; mind has by slow degrees crept into the mighty mass -- the popular Cyman has received a soul!³³¹

Innis interpreted the field of psychology not as a response to irrationality, but as a reflection of it:

The outbreak of irrationality, which in the early part of the twentieth century became evident in the interest in psychology following the steady effects of commerce in the nineteenth century, is the tragedy of our time. The rationalizing potentialities of the price system and its importance in developing

powers of calculation in the individual have failed to prevent a major collapse.³³²

The consequence of the press's obsession with the immediate was a citizenry in North America with attenuated critical faculties, and a commitment to immediate interests, even at the expense of past and future concerns.³³³ For Innis, the West's obsession with the present had three troubling implications, the first being an electorate characterised not by Calvin's ethic of self-restraint, but rather unthinking self-interest. Quoting from Mark Pattison's critique of the English electorate, Innis faulted voters for decision-making "founded on passion rather than reason", for preferring "the interests of its class to those of the whole, and its own immediate to its remote interests."³³⁴

The second by-product of a present-minded citizenry -- historically -- had been the emergence of nationalism. As Innis understood cultural dynamics, there were two ways a culture could evolve if it failed to maintain the proper balance between freedom and constraint. It could embrace the spiritual, and pursue abstract truth, or the temporal, and pursue politics. Quoting John Morley, Innis argued that few societies had the capacity to do both: "There is a decisive preponderance in one direction or the other."³³⁵ In the case of Britain and North America, the emphasis had clearly shifted towards politics. Print culture had served to divide Europe rather than unite it:

National and linguistic differences have been accentuated and internationalism weakened. The mechanization of art intensified nationalism. . . . Following its concentration on the problems of the

immediate, commerce has lost its control as a stabilizing power.³³⁶

For Innis, the press had done more than create isolationist states. Rather the nationalism that emerged was a virulent one. The state became an object of worship:

Popular opinion as a reflection of the middle class became less important, and popular clamour made rapid headway. And so we entered the open seas of democracy in the twentieth century with nothing to worship but the totalitarianism of the modern state.³³⁷

The final consequence was a conception of society governed by force and public opinion as opposed to law.³³⁸ For Innis, this conception proved doubly troubling since it was seen to apply not only to societal relations but also to international relations:

Improvements in communication have weakened the possibility of sustained thought when it has become most necessary. Civilization has been compelled to resort to reliance on force as a result of the impact of technology on communication. The limitations of the price system have meant resort to political arrangements in international adjustment and constant emphasis on appeals to force.³³⁹

The American news columnist Walter Lippmann had been absolutely right, in Innis' mind, regarding the potent role an irrational public had played in global affairs.³⁴⁰ It was a scenario bereft of constraint, and much of Innis' analysis in *Political Economy* was devoted to providing the historic reasons for

the absence of that constraint. Stated another way, Innis' object was not only to demonstrate the press's role in the generation and over-stimulation of mass society. It was also to demonstrate the culpability of print culture in general, and the mass media in particular, in eroding the power of institutions that had brought stability to international affairs.

For Innis, understanding the collapse of western culture meant unearthing the circumstances behind the imminent "end of the long struggle for re-organisation" in international affairs "which began with the breakdown of the control of the church."³⁴¹ Prior to the 16th century, the church had acted as a force for centralisation in European politics. While it had managed to check "the stubborn sentiment of race", or national fanaticism, it had done so through exploitation of its office as mediator between Christendom and God. Rulers who earned the displeasure of the church risked the prospect of eternal damnation.³⁴²

The church's capacity to use fear as an instrument of domination was undercut by the rise of Protestantism and the printing press, which undercut its monopoly on religious life, and allowed scholarship to proceed free of its institutional and ideological pressure. The pursuit of philosophy culminated in the Enlightenment, with the publication of the *Wealth of Nations* in a Calvinist community, and the identification of commerce as a force for international stability.³⁴³ In Britain, Smith's work, combined with the American Revolution, the religious influence of Wesley, and the humanitarian influence of Wilberforce and the Clapham sect led to calls for social and legal reform, the end of slavery, and free trade.³⁴⁴

The pursuit of mammon replaced the pursuit of God as the basis of international stability. But in Britain, that stability was challenged in the mid-19th century by the emergence of the press as an independent self-sustaining agent.³⁴⁵ According to Innis, there were two developments that freed the press from government regulation and party control. The first was the removal of the stamp tax, which had given the *Times of London* a virtual monopoly over the news trade. The second was technological innovation. As early as 1814, the application of steam power to the production of paper and the printing of newspapers had demonstrated the potential of the press to reach a wide audience.³⁴⁶ Further technical improvements, such as paper manufactured from wood pulp, and resort to the rotary press, linotype, and telegraph, freed the newspaper from party support. The concern of the newspaper was now to bring about "an increase in circulation and with all the devices calculated to bring about such an increase to meet the demands of advertising."³⁴⁷

According to Innis, one device the British media was able to exploit with special force in the late 19th century was public interest in foreign affairs. In 1876 the *Daily News* stimulated an uproar in Britain over atrocities being committed in Bulgaria. Gladstone capitalised on the agitation, and from that time according to Innis:

. . .the British public never lost its interest in foreign affairs and domestic matters receded into the background. Foreign affairs are never interesting unless they are exciting and they are far more exciting than questions of domestic legislation.³⁴⁸

While British public opinion became increasingly volatile, the European state system remained relatively stable in the 19th century, largely because the press remained susceptible to manipulation by policymakers. The German chancellor Otto von Bismarck in this respect was the exemplar for Innis, for two reasons. First, Bismarck was focussed on the long-term objective of maintaining peace with Britain. His thinking reflected the 19th century ethos of commercialism insofar as he framed the issues in terms of opportunity cost, including his relationship with the press. Quoting Bismarck Innis noted: "It was easier, cheaper, more humane to supply the English journals with news than to fight England."³⁴⁹

Second, Bismarck was a master of using the press to assist him in attaining his foreign policy objectives. In the late 19th century, the "machinery" as Innis labeled it for maintaining peace was in fact a network, consisting of members from Europe's chancelleries and diplomatic corps.³⁵⁰ While the press had remained susceptible to manipulation, Bismarck and others had proven adept at using it to preserve stability. In essence, policymakers controlled the "control parameter" of information, a skill Bismarck used to check France.³⁵¹

However, even in Bismarck's time the press was proving an imperfect instrument, as "politicians, the courts, the church became aware of a new master - democracy of which the modern newspaper was a reflection."³⁵² The initiative in foreign policy, according to Innis, shifted from a privileged elite to the fourth estate and an increasingly literate public, leading Bismarck to complain that:

It was the cause of the last three wars, . . .the Danish press forced the King and the Government to annex Schleswig; the Austrian and South German press agitated against us; and the French press contributed to the prolongation of the campaign in France.³⁵³

By the 20th century, the press had evolved into an entity devoted to little more than public agitation. Due to the press's culpability in the rise of the Spanish-American and Boer Wars, Innis argued:

In a literal sense, wars are created, as crime waves are created, by the newspaper. Effective news organisation makes catastrophes and catastrophes necessitate improvement of the news organisation. In the history of the Associated Press catastrophes impose sudden strains on the organisation, and lead to the discovery of weaknesses and to their elimination.³⁵⁴

The press, it seemed, retained the flexibility and mental capacity to self-organise after a period of heightened disequilibrium. Innis would press his colleagues in the social sciences to recover the same ability, despite the burgeoning quantities of information appearing in the mid-20th century.³⁵⁵ As we shall see in our next section, he believed it vital that his colleagues make the attempt. Society needed institutions devoted to information management, either by constraining the quantity of information in circulation, or through provision of data, and methods to detect the underlying patterns in data. Such methods, including development of alternate ways to represent information, would enable society to regain the proper balance between rigidity and flexibility, thereby enabling it to react proactively as opposed to passively to changes in the

international and commercial systems binding Europe and North America. With a renewed ability to adapt, Innis believed the West could avoid a reprise of the catastrophes that had plagued the first half of the 20th century.

In Innis' mind the news media's role in provoking the Spanish-American and Boer wars was a mere prelude to its role in instigating the First World War. By 1914, the press had not only generated public interest in foreign affairs, but "the terrifying phenomenon of bitterness which saturated the entire community."³⁵⁶ According to Innis, the press had an institutional interest in fomenting wars, since it was the most effective method for stimulating circulation.³⁵⁷ The agitation prompted by the news glut in August 1914, however, carried a fearful price: "This vast new instrument concerned with reaching large numbers of readers rendered obsolete the machinery for maintaining peace which had characterised the nineteenth century."³⁵⁸ Policymakers were no longer able to contain the situation. In Innis' account, British journalists such as Lord Northcliffe and Leo Maxse instigated the diplomatic chain reaction that culminated in World War I:

In spite of protests from the Foreign Office [Wickham Steed, foreign editor of the *Times*] wrote a leader on the eve of war stating that Austria and Germany could not count on English neutrality if they made war on Serbia. "In accordance with its best traditions, *The Times* led the country." Charles Lowe, a former *Times* correspondent in Berlin, wrote, "It is my solemn conviction . . . that there were in particular two men -- Lord Northcliffe and Leo Maxse -- who will have to answer at the bar of history as main contributors . . . to the causes of the world war."³⁵⁹

The persistent agitation of the news media not only hindered self-regulation in the international system, but the emergence of culture, particularly in Britain. By contrast, Innis noted with approval in *Empire and Communications* the situation that existed in the German states prior to their unification in 1871: "In Germany political censorship in small principalities had a powerful influence with the result that talent was turned to literature, to the universities, and to music."³⁶⁰ For Innis, similar constraints during the first half of the 19th century preserved the integrity of English literature. But with the emergence of an increasingly free press, and increasing amounts of published material, English literature reflected the 19th century shift from reason to irrationality.

For the moment we shall say with Leslie Stephen that philosophical thought and imaginative literature can have no history, being a by-product of social evolution, "the noise the wheels make as they go round," and concentrate on technological developments affecting communication.³⁶¹

The "noise" of British culture, according to Innis, was traumatically affected by the publishing industry's resort to steam power to remove important constraints, including scarcity of paper and printing capacity. Circulation of published materials in British society increased dramatically.³⁶² Still, other important constraints hindered Britain's print culture until the mid-19th century. *The Reform Act of 1832*, however, removed limitations on free expression. The mid-19th century abolition of taxes and economic regulation over commodities

affiliated with the publishing industry removed the remaining constraint to the free circulation of information.³⁶³

While opening the way for a competitive news industry, reforms in Britain's publishing and communication industries dramatically affected the form and content of British literature according to Innis. Early in the 19th century, the Three-Decker novel had been the dominant genre of literature, and for the most part met with Innis' approval, insofar as it permitted appreciation of aesthetic form and the pattern detection that he prized, and associated with systemic change. While expensive, not necessarily a drawback for Innis since price constrained circulation, it had the advantage "of handsome octaves, clear type, and splendid illustrations."

There was no huddling of type and matter, and the pages were not a conglomeration of almost invisible lines. . . . The novel's size involved Procrustean demands on the author, and its patronage by the wealthier classes and the circulating libraries required puritanical standards. Since novels were read aloud by camp light in family gatherings the contents had to be harmless.³⁶⁴

Aside from Three-Decker novels, English literature was also disseminated via literary periodicals, which sprang up in Britain as a result of the stamp tax on news, and *The Times*' subsequent monopolization of the newspaper trade. Journalists such as Charles Dickens between the 1840s and 1860s were forced to shift their efforts towards the founding and editing of periodicals such as *Household Words*, and the results were immediately apparent in English literature

according to Innis. Work characterised by aesthetic form gave way to work reflecting the concrete orientation of the journalist:

Bagehot commented on [Dickens's] style as reflecting "the overflow of a copious mind, though not the chastened expression of an harmonious one." His genius was suited to the delineation of city life since London was like a newspaper: "Everything is there and everything is disconnected." . . . The haphazard absence of form encouraged by journalism influenced Thackeray as well as Dickens.³⁶⁵

After removing the final regulatory constraints on the British media in the 1850s, the British government adopted a series of policies that effectively subsidised it, through the construction of transportation infrastructure that aided circulation, and the *Education Act of 1870* that heightened readership.³⁶⁶ The new journalism serviced the new mass market. According to Innis it stimulated the rise of a new literature, characterised by serial novels, and cheap editions of novels. The Three-Decker novel went into extinction. According to Innis, "books were sold in enormous quantities and popular writers, particularly women, wrote incredible numbers of novels."³⁶⁷ The explosion in printed matter not only affected the form of printed matter, but also the cognitive abilities of Britain's readership. Referring to Arnold Bennett, a 19th century critic of British literature, Innis noted:

Among the defects of the average reader's taste [Arnold Bennett] noted an absence of all sense of beauty of form. "Perhaps the utter collapse of architecture the most influential of all the arts has something to do with this condition of things;

perhaps it is only an effect. "The average reader showed an inability to perceive art-work as a whole, a taste for crude sentimentalism such as supplied by Rudyard Kipling, and a dislike of all fiction disturbing to his basic ideas."³⁶⁸

III

With his description of cultural dynamics and his jeremiad regarding the West's cultural collapse in place, Innis turned to one final task in *Political Economy in the Modern State*, namely to provide a program for social scientists to contribute towards the intellectual, spiritual and material regeneration of the West.³⁶⁹ For Innis, such a program involved three issues, the first being to identify the institutional role that the social sciences and the university played within western culture. The second was to press the social sciences to develop new modes of representation that would encourage the cognitive abilities he prized. Finally, it was to present the method Innis had employed to identify the quantity and rapidity of circulating information as the control parameter governing cultural growth.

Innis believed that the mandate of the university and social sciences in the 20th century was to assume the constraining role once fulfilled by the church and then commerce within western culture.³⁷⁰ For Innis, such a function meant ensuring popular culture retained the capacity to perceive and appreciate the importance of ordering principles, be it concepts in the realms of politics and religion, or aesthetics in the realms of art and literature. Recognition of the

importance of formal cause, he argued, declined in the West as the Church's influence over culture declined:

In Victor Hugo's famous chapter in the *Notre Dame de Paris* entitled "This Has Killed That," he writes: "During the first six thousand years of the world . . . architecture was the great handwriting of the human race," The book destroyed the edifice, and in the religious wars and the French Revolution it destroyed social institutions as well.³⁷¹

Architecture had a specific significance for Innis. In modern parlance, it represented one way to visualise information, to provide a visual analogue that allows a complex idea, or patterns within a complex system, to be apprehended at a glance. While Innis did not explicitly state the significance of architecture in *Political Economy In the State*, its meaning becomes clear when read in conjunction with *The Bias of Communication* and his unpublished manuscript, "History of Communication." In the "Problem of Space" he noted that:

Stone in architecture and scripture emphasized permanence and durability. In the thirteenth century "Tout ce que les théologiens, les encyclopédistes, les interprètes de la Bible ont dit d'essentiel a été exprimé par la peinture sur verre ou par la sculpture. . . . In the Reformation print was used to overwhelm sculpture and architecture as interpreters of scripture."³⁷²

In "The History of Communication" Innis noted that visual information was routinely used during the 15th and 16th centuries in Italy and elsewhere due to the "general inability to conceive abstract ideas." Aside from the church, the arts played a prominent role in making the difficult comprehensible:

The emblem book was devised by Andreas Alciati early in the sixteenth century. . . . Poetry one of the oldest arts was combined with engraving one of the newest. "Emblems reduce intellectual conceptions to sensible images and that which is sensible strikes the memory and is more easily imprinted on it than that which is intellectual." (Bain)³⁷³

The science of heraldry appealed to Innis because it neatly encapsulated the holistic viewpoint he sought, combining "history, literature, fable, science and life." In the 17th century, however, the union between poetry on the one hand, and engraving and the emblem on the other, disappeared with the decline of the church's influence. There was no patron to preserve visual information as a mode of communication: "Science was better taught by other media, the usefulness and attraction of emblems declined in history and literature and the best writers and engravers turned to other interests."³⁷⁴

The emphasis in religious expression shifted to print as well, leading to vernacular translations of the Bible, which stimulated the nationalism Innis feared, and a cultural disposition towards the "factual and the concrete".³⁷⁵ Since Innis perceived print to be an instrument that reduced communication to a mechanical process, he saw it as a poor medium for the communication of abstract ideas. It is not surprising, therefore, that he urged social scientists to devise new ways to represent the patterns that defined and constrained social and economic change.³⁷⁶ In "On the Economic Significance of Cultural Factors" he noted:

Economic history may provide grappling irons with which to lay hold of areas on the fringe of economics, whether in religion or in art, and with which, in turn, to enrich other subjects, as well as to rescue economics from the present-mindedness which pulverizes other subjects and makes a broad approach almost impossible.³⁷⁷

It is striking that contemporary scientists studying *complex adaptive systems* have shared Innis' desire for a broad approach, and have resorted to methods of visualisation, particularly the mathematical construct of phase space, as a means of detecting and representing patterns of physical significance.³⁷⁸

Innis' method of detecting a system's patterns, boundaries, and control parameters, however, rested on a different methodology. In the "Cultural Factors" essay, Innis pressed his colleagues to accept "the limitations of economic history or of the social sciences or more specifically of one framework of the price system." By doing so, Innis argued:

. . . we can improve our perspective regarding the place of the field of economic history and in turn of the social sciences in western civilization. We need a sociology or a philosophy of the social sciences and particularly of economics, an economic history of knowledge or an economic history of economic history.³⁷⁹

Here Innis was referring to a methodology of juxtaposition, in which insights from disciplines were contrasted for further insight, or as Innis would put it in 1952, as a means to "escape from the obsessions of one's own culture."³⁸⁰ Innis criticised his colleagues in the social sciences for harbouring such biases. The historical discipline was hampered by an overemphasis on politics at the

expense of economics. As we have seen, Innis believed the American Revolution emerged due to internal contradictions in Britain's economic policy. The conflict of the 18th century was the product of trends that had developed in the 16th and 17th centuries. The attending constitutional issues were merely surface manifestations of a much deeper problem, one that the bias of political and constitutional historiography prevented historians from seeing. For Innis, scholars who placed too great an emphasis on the history of church or state risked transforming the discipline into the handmaid of the powerful. Historians would have to widen their focus: "Economic history can point to the dangers of bias and the necessity for a broader perspective."³⁸¹

Economic historians, however, also risked highlighting the peripheral at the expense of the central through their focus on quantitative data relating to prices and interest rates. While useful for detecting economic and social patterns, such studies had little probative value since they were not juxtaposed with their cultural and technological contexts. Other scholars realised the importance of combining political, pecuniary, and technological approaches, but imposed a national framework on their studies that may or may not have cohered with the economic system under discussion. Historians of technology failed to link their studies with politics or geography.³⁸²

Innis' methodology was likely an extension of his work as an economist with time series of quantitative data. As Robin Neill has observed Innis "sought explanation in history and time series, not in theoretical argument."³⁸³ The influence of time series is suggested not only in Innis' practice, but also by

repeated references to time series in his communication studies. As we shall see in our next chapter, when Innis refers to the principle of number, he is referring to time series. The identification of Innis' methodology with time series is important because it suggests a philosophy with particular views on the manner of constraint, and the manner of change, governing human history. Specifically, it suggests that systems are governed by constraints that operate locally, not universally, in the same way that emergent systems are governed by local constraints imposed by formal cause, not the universal constraints imposed by efficient cause. The philosophy also suggests that the system's future is governed by a probabilistic conception of change, not the determinate change imposed by universal constraints, because the constraints are local, and because the constraints are an emergent property of a system maintaining the requisite balance between freedom and constraint.

The identification of Innis' methodology with time series, local constraints, and a probabilistic conception of change is also important because it has the potential to affect our understanding of Innis in three ways. First, in this chapter, it provides a basis for understanding Innis' belief that his methodology provided a means to map and describe social, cultural and economic systems. As we shall see, the conception of change associated with time series enables social scientists to posit a relationship between an event in one locale with a succeeding event in a neighbouring locale. By establishing such relationships, social scientists are able to map systems, and describe their behaviour. The establishment of stable relationships between time series would also enable Innis to perform a

second task, namely to identify a system's control parameter, whether it be transportation, or be it information.

Learning more about the contextual nature of certain constraints is also worth pursuing because of the insight it provides regarding Innis' writings on the Oral Tradition, a regime of communication that Innis identified with time series. As we shall see in the next chapter, Innis believed the process of communication itself to be an emergent property. Message variety can only occur when the right mean between order and flux is maintained. Such a mean can only be reached when the application of constraint is not universal but contextual. In forwarding his ideas, Innis was voicing ideas similar to that of the information theorist Claude Shannon. Innis' central message however would be a simple one: contextual constraint enhances message variety and its consequent, mental flexibility.

A review of probability theory will also assist our reading of Innis' theory of media. Innis is of course well known for his argument that the physical properties of media can be correlated with a society's bias, either towards space, and problems of government, or time, and problems of religion. In the next chapter, we will suggest that Innis embedded the relationship between media and cultural bias within a probabilistic conception of change. This suggestion is based on Innis' identification of his ideas with business cycle theory, which as we shall see Innis identified with time series and probabilistic change.

To offer such a reading of Innis' works, however, this study must demonstrate the relationship between time series on the one hand, and the concepts of locally based constraint and probabilistic change on the other. It must

also demonstrate that time series were very much on Innis' mind during the period when he wrote the articles associated with *Political Economy in the Modern State*, and that he viewed them as instruments for detecting the patterns associated with emergent systems. For the latter task, we shall refer to Innis' correspondence with Arthur Cole. For the former, we shall refer to the writings of Norbert Wiener, who advocated a similar methodology employing time series.

Wiener was a contemporary of Innis' who gained public prominence in 1948 with the publication of his book *Cybernetics*. Interested in problems centering on control and communication in biological and mechanical systems, it is striking that the M.I.T. mathematician's work has never been compared with Innis, since both tended to see human societies as self-organizing, self-regulating systems. Both noted that systems receiving excessive information -- or feedback - - suffered from violent oscillations. Moreover, there is evidence that Innis in 1951 took at least an indirect interest in cybernetics and Wiener's work, through his familiarity with the writings of Wiener's M.I.T. colleague, the sociologist Karl Deutsch.³⁸⁴

In his disparate writings Wiener defined the time series as a multiple measurement of an object susceptible to numerical representation, "a sequence of quantities recorded in equal intervals of time." For example, if we measure and record the temperature of Ottawa at 6 p.m., and continue the process for the next 365 days, we have a time series. At a fundamental level, Wiener argued, time series are used for the "recording, preservation, transmission and use of information."³⁸⁵ Use of information in this context according to Neil Gershenfeld

and Andreas Weigend, two contemporary specialists on time series, essentially can be reduced to three tasks, forecasting, modelling, and characterising systems.³⁸⁶

Forecasting refers to the generation of predictions regarding the short-term behaviour of a system. *Modelling* refers to providing a description of the long-term behaviour of a system. For example, the English language is a system. A statement of its phonetic, syntactic, and stylistic rules would constitute a model of its long-term behaviour.³⁸⁷ Finally, *system characterisation* refers to attempts to unearth a system's fundamental properties, where the observer is deprived of *a priori* knowledge about the system. Areas of possible inquiry include the number of degrees of freedom a system enjoys, and its degree of randomness.³⁸⁸

As we shall see, Wiener argued time series should be used for similar purposes, although his statements were less precise. His stated object in studying time series was to devise a "metrical theory of causality," a means to mathematically demonstrate relative degrees of causation, that event "a" was more responsible for causing event "b", than event "b" in causing "a".³⁸⁹ In the determinate world of Newtonian physics, Wiener argued, the concept of degrees of causation was meaningless. In a system in which the position and momentum of all objects are known, and the rules governing those objects are known, "the future of the world can be determined down to the last detail. . . . Here the whole world at one instant may be regarded as the cause of whatever happens at later instants, and nothing less than the whole world will do as a cause."³⁹⁰

The problem with such a conception according to Wiener was that it was not terribly useful, and flew in the face of experience. A judge trying a murder case was not likely to consider the stars running in their courses a significant cause in the victim's death. By contrast, the fact that the perpetrator chose to drop a brick from the top of Rockefeller Centre would be considered important. The basis for the conclusion sprang not from the single observation that dropping a brick led to a death, but the realisation that in the majority of cases in which a brick had been dropped, someone had died: "The basis of causality is now taken to be statistical and the effectiveness of causality depends upon the fact that certain things happen more often than they do not."³⁹¹

They are directly correlated to the notion of probability. If over a large series of cases, under fairly uniform conditions, in nine occurrences where occurrence *a* takes place, it is followed by occurrence *b* in three cases; but in a similar way if out of nine cases where occurrence *a* does not take place occurrence *b* may be expected once, we had better look for occurrence *b* when we see occurrence *a*. Causality is a notion allied to frequency of occurrence.³⁹²

Wiener argued that the frequency of occurrence between two events could be established in some cases by resort to the mathematics of statistical mechanics, and the use of time series. His writings suggest his intent in making this point was to demonstrate the utility of time series for the purposes of *system characterisation and prediction*. In this sense, his reference to a "metric theory of causation" was unfortunate, since his aim was not to establish that event A "caused" event B in the way we would understand a moving ball to cause a

stationary one to move. Rather, his intent was to produce a method to demonstrate that event A was related to event B within the context of a larger system, and that time series could be used to demonstrate the characteristics and future behaviour of that system.

To illustrate his point, Wiener began with the proposition that "if we have two series of events in time, when we study each one separately there is a certain amount of information given concerning its future, but its past is determined."³⁹³ Here Wiener briefly touched on some tenets of information theory that require elaboration to follow the remaining portion of his argument. As Alicia Juarrero notes, there is no pattern in nature, no information in a message, without an ordering context to constrain the pattern's components. If there is no constraint, there is no relation between components: "The most random state . . . is characterized by events which are both independent and equiprobable."³⁹⁴ The effect would be akin to randomly typing sets of letters and numbers on a keyboard. The probability of any one character appearing at any time is the same. While the quantity of potential information or message variety is high, the possibility of conveying information is zero.³⁹⁵

Accordingly, for actual information content to be present, there must be an ordering process that harnesses the heretofore random components. The generation and transmission of a television signal for example requires encryption rules that take the signal away from equiprobability and randomness: television snow. According to Juarrero:

Constraining "the number of ways in which the various parts of a system can be arranged" (Campbell, 1982, 44) reduces randomness by altering the equiprobable distribution of signals, thereby enabling potential information to become actual information.³⁹⁶

One may point to two orders of constraint that limit and shape systems. One order operates in a context-free fashion. It removes the equiprobability of random noise and imposes a probability distribution on the available alternatives. Hence, due to constraints imposed by spelling conventions in English, some letters such as "e" and "s" appear more often than "z". Knowledge of a system's probability distribution is useful insofar as it enables the observer to differentiate between systems. If he observes a document in which the letters "x" and "z" are more plentiful than the letter "a", he has a basis for determining the document was not written in English.

Information systems governed solely by universal constraints, however, contain an important drawback: the greater the certainty in message transmission, the greater the reduction in message variety. Taken to its limit, namely 100% certainty regarding message transmission, such a scenario in our example would mean the effective transmission of only one letter. The principle is analogous to that which applies in a *complex adaptive system*. Apply a certain value of the control parameter and you get flux or noise. Apply a different value and you get stasis or a single message. The attainment of message variety requires application of a different order of constraint, one which allows users to tread the "'fine line' between constraint and total freedom."³⁹⁷

In 1948, Wiener's colleague Claude Shannon made a seminal contribution to communications theory by demonstrating how increased message variety could be reconciled with the goal of noise reduction. In essence, the strategy was to adopt a means of encoding that localised constraint, the means employed in *complex adaptive systems* to obtain heightened complexity, the state analogous to increased message variety.³⁹⁸ Recall that an emergent system can be characterised not only as a network of agents and processes, but also as a hierarchy of agents and processes. A system at one level of organisation becomes an agent of the next. Cells become constituents of organs, organs of organisms.

It is this capacity to localise constraint that enables *cas* to obtain the requisite compromise between entropy and order. While component systems retain their integrity, their capacity to self-organise on multiple levels into ever-larger hierarchies exponentially increases both the potential number of combinations a system can visit, and the behavioural competence of the system.³⁹⁹

A similar principle applies in language. Spelling, syntactic and grammatical rules are akin to self-organizing systems insofar as they make words and letters interdependent. That interdependence, however, means that more words can be created than the 26 letters of the alphabet, more sentences than the total number of words in the English language. The principle of contextual constraint has another important implication: history matters. In the case of sentence generation, a letter's appearance becomes contingent not only on the probability distribution governing the alphabet, but also the sequence of letters and words that precede it. If the last written letter in an English sentence is "q",

the distribution of possible outcomes is quite narrow. The odds that the next letter will be "u" are high, while the corresponding odds that "q" will appear again are low.⁴⁰⁰

It was in this sense of restraint, and the reduced distribution of possible outcomes that restraint imposes, that Wiener referred to when he asserted that a time series contains information about its future. Predictions could be made with time series that were in statistical equilibrium, meaning series in which the probability distribution of a set of terms in the series "is not changed by moving the entire set bodily forward and backward in time."⁴⁰¹ This requirement corresponds with the concept of the context-free constraint. As we saw, English use of the alphabet is governed by a particular probability distribution. The frequency of letter use remains the same, whether it is in the year 2000, or 2001.

Wiener also pointed to constraints that were context specific, arguing that the observer had to note "specific features of the time series. This we term information, and we can define and measure it according to certain rules."

When we know the past of a time series, the distribution of its future is replaced by a narrower distribution which will correspond to a greater amount of information concerning the future. This increase of information may be taken as a measure of its efficacy, of the past in causing the future, and the negative may be taken as an indication of the degree of randomness of the time series.⁴⁰²

For Wiener, the goal of prediction was of a piece with the goal of system characterisation. He did not take it as a given that the past of a particular time

series would be the best predictor of its future. In attempting to assess the future variability of temperatures in Tokyo, for example, the city's past temperatures might provide comparatively little information, indicating a high degree of randomness in the time series.

While such a series in isolation was of comparatively little value, if it was viewed in conjunction with another time series, say that for the city of Osaka, it had the potential to explain a great deal. At this juncture of his argument, Wiener in his various articles and publications emphasised two points. First, the principle of the past constraining the future not only applied within time series, but between time series. Second, when two time series are juxtaposed, "we shall receive more information concerning the future of each than if we were studying them separately."⁴⁰³ In other words, the past weather of Tokyo might serve as a more adequate frame of reference for predicting the future weather of Osaka, or vice versa.

The means whereby the predictive value of each series was evaluated was by taking a set of temperatures from each city and evaluating their success in predicting the subsequent temperatures of their counterpart. The greater success of Osaka temperatures in constraining the subsequent variability of Tokyo's temperatures could be used as a basis for making three conclusions: that Osaka and Tokyo were affected by the same weather front; that this front moved in an easterly direction; and that Osaka weather could be used to predict Tokyo weather.⁴⁰⁴ Using a similar example with reference to North America, Wiener noted:

[Double time series] occasionally make their appearance in engineering applications, but they are most conspicuous in the statistical applications, (both economico-sociological and meteorological-geophysical) since in both instances, the relative lead of one time series with respect to another may well give much more information concerning the past of the second than of its own. For example, on account of the general eastward movement of the weather, Chicago weather may well be more important in the forecasting of Boston weather than Boston itself.⁴⁰⁵

Innis' emphasis on the methodology of juxtaposition suggests he had similar aims to Wiener, namely to use time series -- and different domains of history -- to model and characterise systems of interest to the social sciences. In proposing a framework in which political, economic, cultural and technological history were studied simultaneously, and correlated from the perspective of space, Innis hoped to exploit relationships between time series and histories that were persistent, or in Wiener's words, displayed frequency of occurrence. Tracing such relationships would enable social scientists to map the spatial extent of systems, as well as their regions or components, to identify their control parameters, and to identify the future behaviour of systems when conditions governing the control parameter changed.

In a letter to Arthur Cole in 1941, Innis revealed that he had already enjoyed a measure of success employing his methodology in his studies of Canada's economic history. Such a "geographic approach" had afforded illumination of the "history of areas in which a given industry remains dominant over a long period -- i.e. fur and fish."⁴⁰⁶ In his studies of staples and transport

systems, Innis had discovered that Canada's economy functioned much like a weather system, insofar as sectors specialising in wheat or other commodities were akin to weather fronts that started in the east, and moved west.⁴⁰⁷ The factor precipitating change, Innis argued to Cole was "to a very large extent the transportation cost."

As technological improvements in transportation emerged the production of geographic areas changed. For example the wheat belt moved steadily west and its place was taken by dairying or some other form of agriculture.⁴⁰⁸

In other words, by examining the history of commodity production in Canada's disparate regions, and by juxtaposing his findings with the history of technology and transport rates, Innis was able to map the regional patterns defining Canada's economic history. He was also able to determine the system's control parameter by detecting a persistent relationship between changes in transport technologies and rates, and subsequent transformations of the Canadian economy. The pattern of change in British and Canadian technological history had proven to be one that had narrowed the probability distribution of Canada's economic future, insofar as it engendered a period of economic disequilibrium, and then a shift in economic specialisation, with the newest region of Canada becoming the agent specializing in wheat. Accordingly, Innis was able to characterise Canada's economic history as a "succession of waves of frontiers the character which is largely dependent on transportation rates."⁴⁰⁹ He further

believed that if his method were applied to American economic history, a similar result would obtain. He predicted to Cole that:

If one could see over a long period changes in transportation rates between Europe or Great Britain to North America and between different parts of North America one would at least have a picture of the succession of production waves which marched across North America.⁴¹⁰

While Innis had over 21 years of research experience and data upon which to ground his characterisation of Canada's economic history, it can be argued that his characterisation of European cultural history, and his theories regarding cultural change, did not have the benefit of a similar measure of evidence. Innis' own criteria called for the application of his methodology over the long-term. Given that the bulk of the narrative in *Political Economy in the Modern State* was devoted to the 19th century, by Innis' own measure it emerged as little more than an initial foray in the fulfillment of his ambition to identify information as the control parameter governing the evolution of cultural systems.

To be sure, his narrative had been suggestive, insofar as it posited a relationship between the form and content of cognitive structures -- between changing constructions of change -- and the emergence of new communication technologies. But to demonstrate the persistence of the relationship, it can be argued that Innis felt he had no choice but to extend his analysis from the modern era to the medieval and ancient eras as well. Only such a study would confirm information's importance as a variable affecting the stability of cultures past and

present. This task he attempted to fulfill in his two landmark studies, *Empire and Communications*, and *The Bias of Communication*.

Chapter Five: *Empire and Communications* and *The Bias of Communication*

In May 1948 Harold Innis received one of the singular honours of his long and distinguished career. He was invited to be the keynote speaker for the *Beit Lectures*, a series of talks held each year at Oxford University devoted to a topic in the history of the British Empire. By all rights, the experience should have been one of the highlights of his academic career, but it did not turn out that way. Harold Innis had many fine qualities as a scholar, but even sympathetic critics acknowledged that his lectures could be excruciatingly boring. Hugh Aitken, a former student of Innis' recalled that the lectures at their worst were infuriating, in part because "one was being asked to believe that behind the ambiguity and imprecision there was profound meaning."⁴¹¹ Generally, Canadian audiences tolerated the imprecision.⁴¹² The British, however, were less accommodating. Not only had Innis committed the cardinal sin of being boring. He was also off topic. Instead of providing a lecture devoted to the topic of fur or fish, Innis provided an incoherent rendition of the history of the West. The Oxford audience registered its disapproval with its feet. Some audience members left in the midst of his first lecture. Others failed to return for the succeeding five lectures.⁴¹³

It was not an auspicious debut for the materials that later constituted his 1950 work *Empire and Communications*, and served as a frame of departure for its 1952 successor *The Bias of Communication*. Despite his audience's rebuff, Donald Creighton's biography suggests Innis did not take it personally. He

apparently enjoyed the remainder of his trip to Britain before returning to Canada in August. Innis' philosophical response may simply have been the result of experience. He knew he was not a dynamic speaker, and he suffered no illusions regarding the reaction his lectures would probably engender from his audience.⁴¹⁴ But the content of Innis' two communication studies suggests a further reason for his muted response. Innis came to Britain with the ambition of shifting his audience's attention from British economic history to the grander, more multifaceted problem of Empire. In essence, he was asking his audience to shift from the familiar, the study of commodities and transport, to the unfamiliar, the study of media and communication. If Innis was surprised by his audience's reaction, his own histories suggested he had little if any basis for such a reaction. Both *Empire and Communications* and *The Bias of Communication* are testaments to the persistent tendency of cultures to resist the unfamiliar, often to their detriment. He had no reason to expect a contemporary audience would be any different.

Innis' purpose in offering the lectures and the two communication studies was to fulfill the agenda set forth in *Political Economy in the Modern State*. In that work, he had argued that the development of communication technology since the medieval era had had a direct bearing on the political, economic, social, and cultural evolution of Western Europe and North America. During the 19th century, the capacity of the West to generate information had overwhelmed its abilities to analyse it. The rise of the mass press led to the subsequent breakdown of Western culture in the first half of the 20th century. If steps were not taken to

improve the information management practices of the West, western culture would continue to break down. Innis' object throughout had been to demonstrate that information was the control parameter governing cultural evolution.

Yet, given Innis' own stricture to study social and economic problems over the long-term, and from a number of vantage points, his own agenda suggested the need to move beyond modern European history. If the discipline of economic history was to make a contribution towards Western cultural renewal, and Innis believed it had to, then the profession had to transcend the cultural backdrop from which it emerged, namely British culture and the British economy. In order to establish the importance of information as a factor helping or hindering cultural growth, Innis had to expand his focus from a single empire to the study of multiple empires. Historically in the West, empires had proven to be the dominant template for political, economic and cultural organisation. Comparison of the histories of various empires offered a means to distinguish the essential factors governing cultural change from the peripheral. In *Empire and Communications* Innis noted: "I shall attempt . . . to focus attention on other empires of the East, in order to isolate factors which seem important for purposes of comparison."⁴¹⁵

The factors that Innis believed he would isolate were those relating to the circulation of information in societies past and present. Innis came to his project with the core supposition that empires rise and fall for similar reasons. They are composed of agents that interact with other agents and the environment to form systems with emergent properties. These systems in turn regulate the behaviour

of their constituents through formal cause and interact and adapt to their surrounding environment through final cause. Cultures that retained the capacity to manage and analyse extant information would retain the ability to adapt cognitively, culturally and technologically. Cultures that overloaded themselves with information would not.

Innis' dual emphasis on information and emergence informed the four tasks he undertook in his two studies, starting with his description of cultural change, which he stated most explicitly in his introduction to *Empire and Communications*. As we shall see in our first section, Innis moved beyond the argument set forth in *Political Economy*, namely that the state of a culture's communication technology was an important measure of its ability to control the quantity of circulating information, and thereby adapt to changing circumstance. In the two communication studies, Innis asserted that a culture's methods for ordering information, via the Oral and Written Traditions, and its attitudes towards change were also important measures for determining its success in maintaining the requisite balance between freedom and constraint.⁴¹⁶ Despite the conceptual innovations, the underlying thrust of Innis' message remained the same as those set forth in *Political Economy* and his staples studies. Cultures that ignored the constraints of emergent change suffered a common fate. They collapsed.

Innis' second task was to demonstrate the historical grounds upon which his theories rested, to fulfill the task he had left unfinished in *Political Economy in the Modern State*. In our second section, we will examine Innis' interpretation

of the long-run trends he believed responsible for the rise and fall of the Egyptian, Assyrian, Greek and Roman empires. Innis' purpose in this section was two-fold, to provide empirical support for his identification of information as the key variable governing cultural change, and to provide historical grounds for his contention that a culture's prevailing conception of time was one measure of its success in managing information. Innis argued that cultures recognising systemic forms of change generally controlled their information environments by relying on indigenous cultural forms to interpret their environment. Consequently, they were successful in implementing needed reforms for survival. Cultures saturated with information, by contrast, generally focussed on mechanical forms of change, became fatalistic, failed to adapt, and were overtaken by their competitors.

The concept of formal cause informed Innis' third task, namely his description of the Oral Tradition. In its simplest form, the Oral Tradition for Innis was a communication environment that enabled agents to conceive, and then conceive anew. As we shall see in our third section, the reason Innis identified the Oral Tradition with cognitive flexibility was due to his identification of the same with time series. As we saw in our previous chapter, time series refer to phenomena that are governed by constraints that are context-specific, or in other words by formal cause. Innis appreciated this feature of time series, and further appreciated that its conception of constraint was one shared by language, particularly as it was used in the Oral Tradition. Innis believed the Oral Tradition, and more specifically poetry, facilitated the emergence of new concepts because it provided users with more constituents or building blocks than prose to

generate models. Components of poetry were generated, persisted because of context-specific constraints, and were used and re-used to build new models of greater complexity and precision.

Finally, Innis' fourth task involved provision of a theory of media based on the concept of final cause. Innis' writings on communication technology -- particularly his contention that the physical properties of media can be correlated with a culture's predisposition towards spatial or temporal concerns -- are arguably the most cited and most controversial of his writings. Early readings of Innis characterised him as a technological determinist, as a theorist who argued that communication technologies are the driving engine of cultural history. Their internal properties are seen to shape the worldviews of the users, to the point that human agency goes by the wayside.⁴¹⁷

The consensus of recent interpreters, however, is that Innis was not a determinist. Such a reading is seen to do violence both to the complexity of Innis' thought, and to his repeated insistence that human agency was an important causal factor in the histories of empires past.⁴¹⁸ The general method for rescuing Innis from the charge of determinism has been to identify his histories with an ecological conception of change. In this reading of Innis, cultures are seen to change by virtue of individual and institutional interaction with the environment, which includes everything from the physical properties of media, to styles of script, social structures, geography and the economy. These readings have made valuable contributions to our understanding of Innis by virtue of their insistence

that Innis' philosophy of history was not monocausal, nor built upon the premise that constraint determines human destiny.

The literature, however, can also be characterised as lacking precision in its description of Innis' theory of media. To start, while there is general agreement that a culture's bias stems from the process of interacting with media, Innis' formulation that the physical properties of media can be correlated with cultural bias is still widely cited, and still regarded as having merit.⁴¹⁹ But in forwarding these assertions interpreters are addressing two separate issues. If the emphasis is an agent-medium interaction, commentators are addressing the medium's secondary properties. If the emphasis is on its physical characteristics, the issue is its primary properties. As we saw in Chapter One, the two sets of properties cannot be identified. References to both can be obtained from Innis' writings, a point that in turn raises three questions. Is Innis' theory of media coherent? If so, what are the respective roles of each set of properties in determining cultural bias? And finally, which set of properties did Innis see as the more influential in effecting cultural change?

The question of properties is important because it leads directly to the question of cause. As we also saw in Chapter One, when exploring systems in which the objects of interest are the constituents' secondary properties, we are generally observing systems governed by formal and final cause. When the constituents' primary properties are the focus of interest, the system's dynamics are generally governed by efficient cause. Interpreters have been less than clear on the conception of change they associate with Innis' theory of media. Judith

Stamps, for example, through her emphasis on negative dialectics suggests the importance of agent interaction and systemic change in Innis' thought. Vincent di Norcia has also suggested Innis' purpose was to study systems governed by an indeterminate form of change. Cultures as Innis drew them were social ecologies.

The problem, however, is that both authors have also provided readings suggesting efficient cause. Stamps identifies Innis' theory of media with a geological conception of history, referring to technology as a causal layer, one supplementing his studies of geography, economics and politics. di Norcia also appeals to a reading of Innis in which competing historical forces and institutions operate not in unity with agents, but independently of them. That independence, combined with a narrative in which institutions worked at cross purposes with each other, leads di Norcia to suggest that in Innis' histories human freedom emerges by virtue of conflict. Freedom emerges not because of constraint but in spite of it.

The diffuse picture in the literature is unfortunate because substantial gains in our understanding of Innis' theory of media can be gained if his writings are approached from the standpoint of final cause. Specifically, while several commentators have stressed the importance of agent-medium interaction, and by implication or explication have suggested that cultural bias is an emergent property of that interaction, none have systematically explored an important feature of emergent systems. Namely, such systems have multiple potential outcomes that they can visit. Under one set of circumstances, one array of properties will emerge. Under a different set of initial conditions, a different

arrangement may appear. The outcome is indeterminate. The properties that emerge are a result of the system's history. As we shall see in our fourth section, Innis understood this property of emergent systems, and identified it with final cause.

The point is important because it touches on a number of related questions in the literature, including the question of whether Innis was primarily a materialist or an idealist in his philosophy of history. The consensus in the literature is that Innis was a materialist. This study will differ. The question of final cause is also important because it lends credence to the proposition that Innis' writings have an underlying coherence. Some scholars have questioned this point, in part because Innis' descriptions of the historic effects of media have not always cohered -- in their reading -- with the formulations Innis offers. A reading based on final cause, however, suggests Innis did not intend to suggest a fixed relationship between any given medium and a particular bias, be it towards space, or time. Finally, a reading based on final cause will lend support to the characterisation by Arthur Kroker and Vincent di Norcia of Innis as a technological realist. Innis' worldview did not permit him to harbour illusions regarding the potential impact of communication technologies. Historically, their effects had often been catastrophic. He was not a utopian, but neither was he a 20th century Cassandra. At the conclusion of his study of western civilisation, Innis retained his belief that a creative and stable culture was within the grasp of human design. To attain its realisation, it was imperative that scholars study the past, and learn of the constraints within which cultures operated. If the mistakes

of the past could be identified, perhaps stability for the European and North American present could be retrieved.

I

Of all his writings devoted to communication and cultural change, Innis presented his ideas most explicitly in the introduction to *Empire and Communications*. There he offered seven propositions regarding the rise and fall of empires, many of which sadly have not received their due attention in the literature. Indeed, most treatments of Innis' communication work have generally limited their focus to Innis' provocative ideas on communication media, and the efficacy of the Oral Tradition in promoting cultural longevity and growth.⁴²⁰ It is unfortunate that scholars have traditionally based their readings on such a narrow focus, since Innis never intended such materials to be read in isolation from the remaining materials in the introduction.

In making his propositions, Innis made clear that his interpretive schema stemmed from his earlier work: "In this reference to the problem of attack it will be clear that we have been concerned with the use of certain tools which have proved effective in the interpretation of the economic history of Canada and the British Empire."⁴²¹ The first tenet was that the history of political organization in the West was characterised by periods of aggregation and disintegration. Quoting James Bryce Innis noted that:

. . . from the time of Menes down to that of Attila the tendency is generally towards aggregation: and the history of ancient nations shows us, not only an enormous number of petty monarchies and republics swallowed up in the Empire of Rome, but that empire itself far more highly centralised than any preceding one had been.⁴²²

The political unity of Europe however collapsed with Rome in the 5th century AD. The continent fractured and remained a patchwork of competing principalities until the 13th century, when the trend towards political centralisation reasserted itself. It is important to note that when Innis spoke of aggregation he was not referring to empires as aggregates in the sense used in this study, as a conglomeration of independent particles with no relation to each other except that of spatial proximity.

Instead, Innis in his second proposition argued that empires share a systemic unity by virtue of their susceptibility to self-organization, a point he highlighted by reference to his earlier work on staples. Canada's emphasis on exporting staples to the U.S. and Britain had had a decisive effect on its economic, political and social structure. Periodic shifts to different staples introduced periods of heightened disequilibrium, and subsequent self-organization:

Each staple in its turn left its stamp, and the shift to new staples invariably produced periods of crises in which adjustments in the old structure were painfully made and a new pattern created in relation to a new staple.⁴²³

In *The Bias of Communication* Innis would make explicit a point implicitly made here, that his reading of systemic change was informed by analogies derived from economic theory, particularly those relating to the formation of monopolies and the progression of the business cycle. While recognizing the dangers of arguing from analogy, Innis defended his choice based on his belief that social scientists had an obligation to test the applicability of their concepts, and because "the neglect of the field of communication in studies of cycles warranted a consideration of the extent to which monopolies of knowledge collapse and extraneous material is lost" ⁴²⁴ As we shall see, Innis' ideas regarding monopoly formation and the progression of the business cycle would both figure large in his theory of media.

For his third proposition, Innis referred to an argument made in both his staples studies and in *Political Economy in the Modern State*. Empires, as systems, were subject to periods of stress that required adaptation in order to survive. For that adaptation to occur, empires had to maintain a balance between freedom and constraint, the same prerequisite for emergence in any *complex adaptive system*: "In attempting to understand the basis of these diverse tendencies, we become concerned with the problem of empire, and in particular with factors responsible for the successful operation of 'centrifugal and centripetal forces'." ⁴²⁵

Key to that successful navigation, as Innis argued in *Political Economy*, was a culture that was information rich but not information saturated. His fourth proposition, therefore, was that empires adapted only when the control parameter

of information circulation did not overwhelm agents participating within it. A study of successful and unsuccessful empires, he argued, would demonstrate the importance of regulating "the efficiency of communication" as a means to generate "conditions favourable to creative thought."⁴²⁶

His fifth tenet was that empires are governed by formal cause. He argued that components of empire are governed by a larger distributed whole, one which assigns each component a specific niche or specialisation, incorporates new components to strengthen its formal integrity, and modifies the specialisation of existing components if a new agent can perform the task more efficiently. As we have seen, Innis repeatedly described this form of causation in his staple studies. New France changed the internal economic organization of France. The discovery of gold in the New World had a similar effect on Spain's economy, while Canada's prairie wheat economy altered the agricultural practice not only of neighbouring regions in Canada, but Britain as well. It was a trend that Innis would highlight again in *Empire and Communication*:

Concentration on staple products incidental to the geographic background has involved problems not only in the supply area but also in the demand area, to mention only the effects of specie from Central America on European prices, the effects of the fur trade on France, of wheat production on English agriculture, and of pulp and paper production on public opinion in Anglo-Saxon countries.⁴²⁷

Given that Innis was espousing a concept of empire with dynamics markedly similar to *complex adaptive systems*, it is not surprising that he laid great stress on the role of formal cause and on the activities of agents -- be they

individuals or institutions -- that comprised the regimes he studied. It is here that he introduced the concepts of the Oral and Written Traditions and his sixth precept: empires survive when their constituent agents can adapt prevailing concepts and behaviour to changing circumstances. Such changes can only occur in cultures governed by the Oral Tradition, namely societies in which participants are not inundated by large quantities of information, are aware of their core suppositions, and are able to challenge them. As we shall see later in this chapter, Innis argued that societies governed by oral communication demonstrated a flexibility and sophistication in thought that eluded cultures governed by the Written Tradition.

In differentiating the two traditions, it is important to note that Innis' primary concern was not the method of communication. In his framework, it was perfectly possible for a culture governed by the Oral Tradition such as ancient Greece to resort to written forms of communication to facilitate trade, scholarship and the conduct of government. The crucial point of distinction was whether a culture's agents were actively engaging with the ideas and cultural forms circulating in the public domain. Were extant artistic, scientific, and religious ideas being challenged, modified, or passively accepted? Indeed, for Innis the act of writing itself constituted one means to challenge the cultural *status quo*, and as such could be categorised as an activity consistent with the Oral Tradition. As he would note in *The Bias of Communication*: "Reading in contrast with writing implies a passive recognition of the power of writing."⁴²⁸ By contrast, Innis believed agents operating in cultures governed by the Written Tradition could not

challenge extant suppositions. The problem was not the presence of written notation but rather the quantity of circulating information. When there was too much, agents adopted a passive stance, since there was no hope of mastering the ideas in circulation, much less discussing them with equally informed contemporaries.

Innis' seventh tenet addressed to communication media is arguably the most celebrated and most debated in the literature. Historically, Innis argued, cultures have displayed a tendency to emphasise concerns that relate to the dimensions of space or time. Some cultures, such as ancient Rome, concentrated their energies on problems of governance and law, matters pertaining to the control of space. Other cultures, by contrast, were more disposed to emphasise commercial or religious concerns, matters pertaining to the control of time. In the city-states of Mesopotamia for example time and treasure was devoted to the maintenance of the cult, which controlled not only the city's religious life, but also its cultural, scientific, and linguistic activity. For Innis, the history of the West could be construed as an effort by cultures and institutions with a bias towards space to come to an accommodation with counterparts retaining a bias towards time.

Empires that failed to reach such an accommodation became politically unstable and routinely collapsed. The Mesopotamian city-states for example never had more than a modest control over space and routinely proved susceptible to conquest by empires ranging from Egypt to Assyria. In the aftermath of invasion, however, imperial authorities routinely sought accommodation with the

city's priestly caste. Rulers who failed to do so ran the risk of civic unrest, as the Babylonian priesthood was not above using its ideological influence over the region's inhabitants to foment rebellion.⁴²⁹

The proposition that spiritual and temporal powers have historically clashed was hardly noteworthy. But Innis' claim that a culture's predisposition towards time or space could be correlated with the physical properties of its communication media was a new, and ultimately controversial, contribution to the historiography of the West. In his essay the "Bias of Communication" Innis argued that:

A medium of communication has an important influence on the dissemination of knowledge over space and over time and it becomes necessary to study its characteristics in order to appraise its influence in its cultural setting. According to its characteristics it may be better suited to the dissemination of knowledge over time than over space, particularly if the medium is heavy and durable and not suited to transportation, or to the dissemination of knowledge over space than over time, particularly if the medium is light and easily transported. The relative emphasis on time or space will imply a bias of significance to the culture in which it is embedded.⁴³⁰

Media were important, Innis argued, because they placed constraints on human endeavour. If agents employed a heavy, durable medium it was likely that they would form smaller, decentralised institutions since it was difficult to convey stone, papyrus, and other durable media over long distances. By contrast, agents using a lighter medium were more likely to form larger centralised institutions capable of controlling sizeable territories.⁴³¹ The ultimate importance of media,

however, resided in their capacity to channel agent attention to a restricted range of human concerns. Institutions and societies employing durable media were more likely to focus their energies on questions of time, ultimate meaning, and religion, in part because the expense required to instantiate information mandated the effort be extended only for activities of the highest significance. By contrast, the cost of transmitting information in time and effort with papyrus was comparatively low. Cultures employing it and other light media had the luxury of broadening their focus to include other concerns, including law, governance and philosophy, the problems of space.⁴³²

Innis' formulation provoked controversy because it smacked of technological determinism, a perception that was bolstered by a final tenet regarding cultural change offered in his essay "The Bias of Communication." In the essay Innis argued that the ultimate outcome of agent-medium interaction was not merely the limitations of one's focus to a specific set of concerns. One may have a focus, and yet recognise the existence of phenomena beyond one's domain, and the necessity of their study. For Innis, what had ultimately transpired historically was a situation in which the same set was defined as the only extant phenomena to be studied. When an agent in the form of an individual, institution or society reached this extreme conclusion, Innis argued it had rigidified into a "monopoly of knowledge." Typically, such monopolies formed when a culture shifted from the Oral Tradition to the Written Tradition, and concentrated on the acquisition and preservation of existing knowledge as opposed to discovering new knowledge. For Innis, the price of such cognitive rigidity had typically been very

high. Cultures that stopped innovating generally became targets for invasion by their neighbours. In "Minerva's Owl" Innis noted that:

An interest in learning assumes a stable society in which organised force is sufficiently powerful to provide sustained protection. Concentration on learning implies a written tradition and introduces monopolistic elements in culture which are followed by rigidities and involve lack of contact with the oral tradition and the vernacular. . . . "Most organizations appear as bodies founded for the painless extinction of ideas of the founders." . . . This change is accompanied by a weakening of the relations between organised force and the vernacular and collapse in the face of technological change which has taken place in marginal regions which have escaped the influence of a monopoly of knowledge.⁴³³

Media of communication, therefore, seem to be the driving engine of cultural change for Innis. On the one hand, their use determines "the character of knowledge" and limits a culture's cognitive flexibility. Yet on the other hand, media seem to propel cognitive adaptation, opening new vistas for exploration, and leading "to the emergence of a new civilization."⁴³⁴ In each case, it is media that seem to be propelling change while individual agency falls by the wayside. If such a reading actually reflected Innis' intent, scholars would have grounds for complaint, and not only because of a presumably doctrinaire decision to remove human purpose as a causative factor in history. It would also stem from Innis' insistence that human agency retains a role in his theory of media.

The apparent discrepancy was one that troubled Northrop Frye in a 1981 reading of the preface to *The Bias of Communication*. In the preface, Innis announced his intention to answer a question posed by James Ten Broeke, his

former philosophy professor at McMaster University: "Why do we attend to the things to which we attend?" Innis' answer confused Frye. For contrary to expectation, he asserted that changes in media of communication *followed* changes in a culture's world view: "I do not understand the word "follow", as it clearly seems to be Innis' view that changes in communication are involved in, or accompany, or in many cases are even the cause of, historical changes of attention." ⁴³⁵

The apparent contradiction noted by Frye is difficult to resolve if Innis' writings on media are approached from the standpoint of efficient cause. It is not difficult to resolve, however, if Innis' work is read using the framework suggested in the introduction to *Empire and Communications*. As we shall see in the following sections devoted to the link between social constructs of change and state behaviour, the Oral Tradition, and communication media, Innis' writings all suggest his belief that cultural change is governed by formal and final cause. By appealing to these two forms of causation, Innis embraced a framework that enabled him to assert that *both* human agency and communication media were important constituents in the process of cultural change, for empires past and present.

II

Innis based his study of prevailing conceptions of change on a straightforward supposition, that a society's interactions within and without are in

large part determined by the cultural forms used to represent and organise the world. Consequently, while tracing the histories of ancient empires, he believed much could be learned from an examination of the worldview, or mixture of worldviews, that successful imperial regimes had brought to bear during their period of hegemony. As we shall see in this section, Innis would graft four conclusions regarding cultural schema into his narrative of the rise and fall of the Egyptian, Assyrian, Greek and Roman Empires.

The first would suggest the importance of competing schema of change in any society. Over reliance on either a systemic or mechanical conception of change would hinder adaptation and precipitate collapse. The second proposition was that a society had to attain balance on two levels. There had to be balance not only in prevailing constructs, but also in the degree of freedom and constraint operating in society, a tension that was determined by the quantity of information in circulation. Without balance in the latter, there could be no balance in the former. Innis' third tenet would suggest the historic importance of schema of change in which human agency retained a contributing role. Cultures that relied on such schema were able to adapt in the face of changing circumstance. Finally, Innis argued that cultures that relied exclusively on mechanical forms of change became rigid in their thinking and behaviour. And worse, they became fatalistic. Once cultures lost hope that their actions in the present could positively affect their station in the future, they ceased all effort to reform current practice, and eventually succumbed to invasion by a foreign competitor.

When examining Innis' writings on the history of empire, there are several reasons why it makes more sense to start with Greece than Innis' choice of Egypt. The first is that his disparate treatments of Greece provide the fullest most explicit descriptions of mechanic and systemic change in the book, and demonstrate that Innis identified the two respectively with the bias of space or the bias of time. Second, emphasis on Greece is important because for Innis it most clearly demonstrated the possibility that cultures could become aware of their core suppositions when circumstances required, question them, and change them, particularly those relating to time and space. For this reason, Innis considered Greece the exemplar of all the regimes he studied. It typified the Oral Tradition in action, and in so doing initiated an unprecedented outburst of cultural activity, a feat which he believed succeeding cultures, including our own, have failed to match.⁴³⁶

Third, the writings are important because there Innis took the greatest care to link a schema of change with the subsequent behaviour of Athens and other Greek city-states. Greece distinguished itself, in Innis' estimation, because of its willingness to subject its political practices to critical scrutiny, in effect creating the first political science. As we shall see, the Greeks routinely appealed to constructs of mechanical and systemic change to inform their conduct of "the highest of the political sciences, the science of man." Innis would credit it with implementing constitutional reforms designed to simultaneously enable the individual to live "with the fullness of life" while fulfilling "his function as a

member of the social organism."⁴³⁷ For Greece, the metaphysical was the political.

And finally, Innis' writings on Greek culture are important because they provide a frame of reference for interpreting his treatments of other empires, including Egypt, Assyria and Rome. When referring to the worldviews of these cultures, Innis often referred to traits such as a belief in fate, monotheism, and the onset of redemptive religions. In isolation, the significance of these references is difficult to assess since Innis does not link them to a construct of mechanical or systemic change. In his discussion of Greek culture, however, he does. In this section, therefore, we will begin with his treatment of Greece before turning to a brief reading of his narratives covering Egypt, Assyria, and Rome. In each case, Innis would emphasise that an empire's longevity was dependent on its capacity to manage information, and its construction of time.

Innis begins his narrative in the 8th century BC with the emergence of the city-states or more properly the family-state, since power was concentrated in the hands of the *Eupatridae*, or Greek nobility. Pressure emerged almost immediately to change the constitutional *status quo* for three reasons. First, prior to the 8th century, law was neither written nor was it posted. Rather, existing law was memorized and declared by the *Eupatridae*, a situation that had an important drawback: "'In the absence of a written code, those who declare and interpret laws may be properly said to make them' (Thirwall)."⁴³⁸

Second, due to the establishment of colonies from 750 to 670 BC, the discrepancy in property and civic rights enjoyed between colonies and the original

city-states brought questions of governance -- questions relating to the control of space -- to the fore. Pressure emerged to codify law, and to make it publicly accessible in written form.⁴³⁹

Finally, due to the establishment of trading relations with Egypt in 670 BC, and with it access to papyrus, the new medium instigated a period of cultural disequilibrium, as Greece became exposed to Egyptian and Mesopotamian ideas, and new forms of literature and poetry emerged to supplant the old. While Greece was not overwhelmed by an influx of information from the Near East, due to limited access to papyrus, the influx of information was sufficient to prompt questioning of old verities, including those that bolstered the *Eupatridae's* monopoly on power.⁴⁴⁰

Innis argues that during this period of cultural flux poets began attacking traditional theological conceptions while Ionian philosophers generated new ones. One important innovation was the transformation of the nature gods into anthropomorphic deities, each one representing one of the higher functions of life. A second innovation was to bring the gods within the constraints of time and space through the philosophy of *Eros*. In contrast to the doctrine of the *Logos*, which pointed to emergent change through the creative acts of *Yahweh* and other deities, the Greeks disassociated change from agency and made it a function of a self-sustaining procreative series governed by law: "The Greek view of the relation of men to the gods was mechanical."⁴⁴¹ Quoting Werner Jaeger Innis noted:

The Logos is a substantialization of an intellectual property or power of God, the creator, who is stationed *outside* the world and brings the world into existence by his own personal fiat. The Greek gods are stationed *inside* the world; they are descended from Heaven and Earth, the two greatest and most exalted parts of the universe; and they are generated acts by the mighty power of Eros, who likewise belongs within the world as an all-engendering primitive force.⁴⁴²

In contrast to the Near East, Greece did not have a strongly developed centralised cult with ambitions to regulate Greece's public and intellectual life. Consequently, Greek philosophers enjoyed the freedom of tailoring theology to meet the demands of experience: "The Hebrews made philosophy the handmaid of religion and the Greeks subordinated religion to philosophy."⁴⁴³ The measure of Greece's freedom, therefore, was its capacity to conceive the gods within the rubric of natural law. A second measure according to Innis was the Ionian philosophers' resort to mathematics in place of allegory and myth as the basis for making generalisations. For Anaximander and other philosophers geometry "was seized upon as the very centre of the true philosophical sort of knowledge."

Mathematics was recognised as something which could be reduced to general laws with a scientific content. The Ionians were under the spell of an undissolved relation between man and nature but saw the possibility of establishing an intelligible coherence in the phenomenal world.⁴⁴⁴

The search for intelligibility eventually paid dividends according to Innis. In 585 BC Thales of Miletus, building on the Chaldean discovery of the periodic nature of celestial phenomena, correctly predicted the onset of an eclipse.⁴⁴⁵ The

conceptual advantages of the Ionian philosophers, however, also brought costs. As their insights were systematised into the Olympian tradition known as *Moirai*, a cosmology emerged in which the universe's constituents were seen as discrete components. Instead of emphasising the secondary properties of phenomena -- the "undissolved relation between man and nature" -- the Greeks focussed on their primary properties. In its totality the universe was an aggregate, governed by a concept of "causality that was static, simultaneous and spatial." The world was seen as "pluralistic, rationalistic, fatalistic, opposed to otherworldliness, and distributed into spatial provinces."⁴⁴⁶ The worldview as Innis described it was not all that different from Newtonian mechanics, with its emphasis on universal law, space, mechanical or "fatalistic" change, and an emphasis on the primary properties of objects:

The Olympian tradition which assumed fixed limits to the power of gods and men emphasised spatial concepts and in turn geometry. The science of nature dominated by geometry involved a concern with the internal properties of things rather than their relations with other things.⁴⁴⁷

While Greek philosophers were elaborating on the philosophy of *moirai*, Athenian politicians were simultaneously addressing spatial concerns according to Innis in the form of constitutional reform. Draco, one of three seminal law makers referred to by Innis, began a process of legal reform in 621 BC that would culminate in the establishment of the democratic city-state in the following century. Draco's contribution was two-fold. With the creation of Draco's code, he systematised law and made it a matter of public record. He also loosed the

aristocracy's monopoly on power. It was a necessary accommodation. Due to the mountainous topography of Greece Athens' army remained dependent on infantry, and was forced to incorporate non-nobles into its ranks.

A noble, Draco realized the stability of Athenian society was threatened by the presence of an army with interests at odds with the ruling class. His solution was to create a second legislative body composed of non-noble *hoplite*, or infantry, as a check to the *Areopagus*, the ruling council composed of the nobility.⁴⁴⁸ While Greek society devoted greater attention to spatial relations, according to Innis the shift was neither sufficient nor complete. The constitution still allocated the lion's share of power to the aristocracy, and Greek law remained saddled with harsh sanctions, including enslavement of debtors with outstanding obligations. It remained for Solon, therefore, to undertake more fundamental reforms in 594 BC. A contemporary of Thales of Miletus, it was during Solon's archonship (the city's executive position) that tenets of Ionian philosophy were consciously translated into political practice, according to Innis. In particular, Solon adopted the concept of universal truth suggested by celestial mechanics into a universal conception of justice. Law, Solon argued, should be universally and impartially applied based on the justification that an unremedied injury to the one was a threat to the stability of the whole.⁴⁴⁹

The application of universal justice, however, demanded state mediation of conflict and greater input by the populace in the generation and interpretation of law. Consequently, according to Innis Solon substantially reduced the range of actions families could take to seek redress for injuries, but augmented Athenian

residents' rights to participate in government. He distributed power, first by removing the nobility's exclusive right to interpret law: "Solon discovered the secret of democracy in 'the constitution of the judicial courts and the whole people' (Bury)." Solon also afforded the city's residents greater access to the city's legislative and executive organs of government, by giving the city's working class a voice on the city's popular assembly, and by removing the nobility's exclusive control of the archonship.⁴⁵⁰

Solon also attended to the needs of space in Innis' narrative by altering policies that were actually or potentially disruptive. He removed the institution of personal security for debt. There would be no further enslavement based on finances. He also attempted to forestall friction between the city's commercial class and the nobility by exchanging economic policies that favoured the latter for those favouring the former. Insisting on the development of industries such as pottery, Solon forbade the export of natural products except olive oil, a regulation that ran counter to the interests of the ruling class that had a strong stake in cereal production. The policy, combined with the increased use of metal coins (dating from 700 BC), stimulated a robust trade.⁴⁵¹

The problem, however, is that Solon's reforms again did not go far enough, for reasons political and philosophical. Despite his constitutional reforms "Solon had left the great families too strong," and the regime collapsed in 561 BC, five years after Solon vacated the archonship.⁴⁵² Solon's commercial policies according to Innis had resulted in the emergence of the commercial class as a powerful new constituency, one that was independent, resentful of the

aristocracy's pretensions to power, and willing to challenge it. In 561 BC, Athens' merchants supported Peisistratos' seizure of the government. His coup initiated a 50 year period in which the city was ruled by tyrants.⁴⁵³

Philosophically, Solon's reforms failed because they derived from a construct of change that emphasised a static universe comprised of discrete elements. From such a policy one could derive a politics that envisioned factions with competing interests and a state respecting the dignity and integrity of the individual. One could not, however, derive a politics that suggested that factions cooperate to maintain the unity and duration of the state: "The philosophy of spatial externality involved discreteness and neglected the importance of continuity."⁴⁵⁴ Indeed, the tenets of *moirai* and geometry had seemed to undercut it. By emphasising and demonstrating the presence of periodic change, Ionian philosophy undercut the systemic vision of change provided by myth, and with it the ideological justification for the continuance of the state.⁴⁵⁵

Aside from addressing the need for continuity, Solon's political philosophy was unsatisfactory for one further reason according to Innis. It failed to address the temporal experience of merchants derived from a life in a commercial economy based on trade and money. Athen's collapse suggested the need for a new political philosophy, one which of necessity would take an interest in arithmetic and time.⁴⁵⁶ A shift in thinking was also prompted by public disaffection with the tenets of Olympian theology. Worshippers, unhappy with a religious tradition in which a practitioner's interaction with the gods was defined as a commercial interaction or bribe to prevent misfortune and garner good

fortune, began searching for alternatives that offered communion with the divine. Many turned to the cult of the mystery god Dionysus and mystic forms of philosophy. According to Innis while Olympian theology emphasised humanity's discontinuity from the gods, in Dionysian worship: "The characteristic rite was sacramental -- an act of communion and reunion with the *daemon*." As a mystic religion it offered the hope of systemic unity, or the "prospect of union with God."⁴⁵⁷ Greek philosophical inquiry shifted to concepts emphasising "Time and number (the measure of time) and by righteousness (*Dike*)."⁴⁵⁸

Aside from an emphasis on time and number, there are other reasons why Innis associated Greek mystical cults and philosophy with systemic change. To start, while the tyrants supported the Dionysian cult in Athens and elsewhere, in order to obtain religious sanction for their rule, as an organization it was "not a fixed part of an official state religion" but rather a "trans social organization." It was not bound by political boundaries anymore than economic systems were. What is more, it embraced a doctrine of emergent change, in part by subscribing to a quasi-monotheism: "Outside the Olympian polity he became the god of his church His worshippers would have only one god." Aside from henotheism, emergent change was also signalled by the cult's re-embrace of the doctrine of the *logos*.⁴⁵⁹

The doctrine of the *logos*, monotheism, communion, and the ecstasy of the spirit were not the only Christian ideas relating to emergent change anticipated by the Dionysian cult. According to Innis the rite also shared the hope of death and resurrection: "As a religion of the life of earth and man, of the life which dies but

is perpetually reborn, Dionysian worship had a secret vitality which offset Olympianism with its divine jealousies and the impassable gulf of *moria*.^{"460} For Innis, the key to much of the vitality associated with Dionysian worship, and with myth in general, lay in its insight that figure emerges from a ground embodying contradictory qualities, be it life and death, freedom and constraint, or space and time. As with *complex adaptive systems*, form in mythic constructs of change emerged from the interplay of opposing forces.

Heraclitus (540-475 B.C.) emphasised [mythical religions] with its principle of *Dike* or righteousness and contributed to the break-up of concepts of state absolutism. He denied being altogether and regarded all becoming as originating in a war of opposites. "I contemplate the becoming." . . . Man was given a place as a completely cosmic being and the claim of wisdom to supremacy was justified by saying that it taught men in speech and action to follow the truth of nature and its divine law. True wisdom was found in language since it was an expression of common wisdom which is in all men and only partly obscured by false opinions. The structure of man's speech was an embodiment of the structure of the world. *Logos* was recorded in speech and *physis* was a representation of social consciousness. "Do not listen to me but the word and confess that all things are one."⁴⁶¹

According to Innis, by the closing decade of the 6th century BC the Dionysian challenge itself began facing criticism. Ionian philosophers began attacking its excesses, particularly the disavowal of its adherents of any sense of constraint. The limitations of being had to be reconciled with the freedom of becoming. Accordingly, Greek philosophy attempted a reconciliation of "the

static concepts of order and space with the dynamic concepts based on mythical religions."⁴⁶²

The Orphic and Pythagorean movements both added conceptions of constraint to mystic religious concepts, Pythagoras through appeal to the principle of number. In Innis' understanding of Pythagoras, the concept of number harmonized static and dynamic concepts of change by simultaneously embodying the principles of correspondence and succession: "From his time there was an intimate association, 'not to say an indissoluble correlation between the theory of numbers and the theory of extension: between arithmetic and geometry'."⁴⁶³ As such, numbers could be used "as an aid to the reconstruction of any representation of the conditions involved in the order of nature."⁴⁶⁴ To underscore this point Innis referred to the work of Alfred North Whitehead, noting:

Whitehead has pointed out that in the period from Pythagoras to Plato, as in the seventeenth and eighteenth centuries, general categories of thought were in a state of disintegration. Only in periods of disengagement from immediate pressure of circumstances and eager curiosity could the age spirit undertake a direct revision of final abstractions hidden in more concrete concepts. In these rare periods mathematics became relevant to astronomy. A.N. Whitehead, *Science and the Modern World* (Cambridge, 1926), pp. 39, 49.]⁴⁶⁵

As the Greeks began placing constraints on the excesses of Dionysianism, therefore, they began to frame their environment in a fashion similar to the one proposed by Innis in *Political Economy in the Modern State* and in his correspondence with Arthur Cole. Recall that in the Cole correspondence Innis

proposed the interpolation of time series of price data as a means to model and characterise systems such as the North American economy. Especially in the field of U.S. economic history, Innis believed such a study would permit the establishment of a larger spatial and temporal abstraction, "a succession of production waves," by interrelating the concrete, namely existing price studies of American river basins.⁴⁶⁶

In 1943 he told Cole there was no "background which would enable one to understand the regional chapters of Mills' *Behavior of Prices*. Each drainage basin up to the railroad, and I suspect beyond it, had its own equilibrium which changed with major developments in other drainage basins and with itself."⁴⁶⁷ In 1951 Innis would make a similar observation in his *Idea File*, noting:

"Significance of space to history, i.e. emergence of a great number of regional histories with little broad integration with that of other regions -- influence of geography on history."⁴⁶⁸ The Greeks realized, therefore, that insight into emergent systems was gained via models embodying the principle of number, or more specifically the principles of correspondence and succession.

The efforts of Pythagoras and other Ionian philosophers to apply rigor and constraint to the dynamic concepts of the Dionysian cult had important consequences for Greek society. In the field of theology, and with the regulation of the cult's ecstasies, the temporal concepts associated with *dike* and the *logos* according to Innis proved sufficiently palatable to the established Olympian cult to meet acceptance. The transformation was such that by the 4th century Pythagorean doctrine would identify the *logos* with the rational rather than the

ecstatic part of the human soul. The phenomenon of emergent change, however, remained:

Personified reason or the *Logos* as the rational part of the soul with an existence above the daemons had emerged as a second god by 350 BC. An idea of definite conversion or of abiding change in the individual mind had appeared.⁴⁶⁹

In the field of art, an aesthetic emerged emphasising "the unity of time and space." Prior to Pythagoras, Athenian pottery had been characterised first by geometric patterns (900-700 BC), and then narration via a temporal progression of figures. In the sciences, a now familiar metaphor emerged: "Empedocles (490-430 BC), a citizen of a Dorian state, as founder of the Sicilian school of medicine attempted to combine the mystic tradition with Ionian science by emphasising complexity."⁴⁷⁰

In the field of politics, Cleisthenes, a noble and member of the Athenian *Alcmaeonidae* party, led a revolt in 511 BC and overthrew the tyrants with military assistance from Sparta. In Innis' eyes, Cleisthenes came to power with a mandate to establish a constitution that balanced Athens' spatial and temporal concerns. Prior to the rule of the tyrants, the nobility had exercised too much power, and consequently too much constraint, over Athenian development.⁴⁷¹ During the period of the tyrants, the reverse held true. Athenian society fell into a 50-year period of heightened disequilibrium:

The tyrants in Athens as in other Greek cities . . . emerged between periods dominated by old methods of government and newer powers more

closely adapted to economic and social difficulties incidental to problems of spatial organization.⁴⁷²

Cleisthenes fulfilled this agenda according to Innis through a program designed to end once and for all the *Eupatridae's* pretensions to power. While Draco ended the aristocracy's monopoly on the generation of law and Solon ended its monopoly on its interpretation, Draco ended its hold on the populace by undercutting its primacy in Athenian religious life. Much of the nobility's power rested on its historic role in interpreting sacred law related to the city's lunar calendar.

Cleisthenes' solution was to replace it with a solar calendar, and to obtain popular support for the reform by obtaining sanction from the religious authorities at Delphi.⁴⁷³ In essence, he usurped the control of time for the state. He nullified the claim of a competing institution for popular allegiance: "The Greeks opposed the raising of gods and religion to an independent position dominating the state and brought to an end the threat of a theocratical and monarchical order."⁴⁷⁴

While addressing the control of time, Cleisthenes also undercut the nobility's control of space: "The family state was broken down and its political and religious claims inherited by the state."⁴⁷⁵ Cleisthenes attained this aim first by re-drawing the political boundaries inside Athenian territory, creating new units that bore no relation to the historic divisions associated with noble rule. He also undercut the nobility's control of legislation by eliminating the *Areopagus* and creating a new legislative body, the Council of 500. Representation in the new body was allocated on a new basis, not according to social status, but

according to location. Power was distributed to the populace, and procedures to mitigate excessive party strife were implemented through resort to ostracism. And in so doing, Innis argued that Cleisthenes laid the basis for a stable polity, a balanced society, and a vibrant culture:

A concept of the people in a democratic electoral system based on the territorial principle became the basis of the constitution. . . . The Greeks seized on the spatial concept as developed by Ionian philosophers and on the temporal concept emphasised by mystical religions to construct a political society which stood the test of resistance to the Persian empire.⁴⁷⁶

In Innis' narrative, however, Athens' Golden Age lasted only for a brief period during the 5th century BC. Cleisthenes' reforms not only brought a sense of internal unity to Athens, but also provided it with the political acumen to forge an alliance with neighbouring city-states in response to Persia's conquest of Miletus in 494 BC. The coalition defeated Persia in 478 BC. The sense of pan-Hellenic unity survived the war, as citizens from neighbouring city-states were permitted to settle in Athens and marry its inhabitants. But the comity was short lived, and in Innis' opinion the chief reason for the breakdown was the emergence of writing as the dominant instrument of communication in Greek culture.⁴⁷⁷

The quantity of information circulating in Greek society rose dramatically in the 5th century for reasons cultural and technical. Prose was construed by the inhabitants of the time as the literary genre of the democratic city-state, and a vibrant literature emerged, although in Innis' opinion this was due to a "very limited book production." Those limitations eventually fell by the wayside, in

part because the reduced formal constraints in prose literature made it easier to produce than poetry, and in part because of the emergence of a reading public demanding access to printed works: "In 478 BC Athens had no reading public, but by 430 BC Herodotus found it convenient to turn his recitations into book form." The control parameter of circulating information was also affected by the onset of more efficient writing practices. The direction of Semitic letters in use was reversed, and Greeks began writing from left to right instead of right to left.⁴⁷⁸

The ultimate impact of writing according to Innis was that it destroyed "the bond of Greek life," which in turn precipitated the decline of Athens and the entire city-state system. One manifestation of the divide was the rise of civic nationalism, and the corresponding suppression of pan-Hellenic cults. In Athens, civic unity was undermined by Pericles' reduction of the legislature's powers, and the government's disenfranchisement of a substantial portion of the populace.

The Delian League, the coalition of city-states dominated by Athens, was split by Athenian efforts to further consolidate its hegemony, and eventually consolidated into two opposing factions, with democratic states following Athens, and oligarchic states following Sparta. The competition of the two blocs for clients eventually precipitated the Peloponnesian War in 431 BC, which ended with the defeat of Athens in 404 BC. Sparta enjoyed a brief supremacy, but was itself defeated by the Thebans in 371 BC. The entire city-state system ended with the rise of Philip of Macedonia at the end of the 4th century BC.⁴⁷⁹

With political decline came cultural decline. While Greece experienced a brief resurgence of creativity in the works of Socrates, Plato and Aristotle, the vast rise in quantity of written material produced by slave labour, especially after the rise of the Hellenic kingdoms ultimately resulted in cultural stagnation:

The power of the written word made the Alexandrine age one of "erudition and criticism", of specialists rather than poets and scholars. The Alexandrine man was "a librarian and corrector of proofs and who, pitiable wretch, goes blind from the dust of books and printers' errors" (Nietzsche). Collectomania and large libraries accompanied taste and respectability. Aesthetic opinions were crystallized and the dilettante appeared.⁴⁸⁰

With cultural stagnation came an attending trend that Innis had identified in *Political Economy in the Modern State*, a division between elite culture and popular culture. The influx of information subverted the social unity of the city-state, replacing it with a divide in which the educated subscribed to philosophy, while the populace allied itself with religion, often faiths from the East:

Communication between those under the influence of philosophy and those under the influence of religions became increasingly difficult. Cultural division facilitated the development of a class structure.⁴⁸¹

Greece's ultimate emphasis on the Written Tradition, Innis charged, ultimately weakened the science and the philosophy that had been its saving grace against Persia, and opened the way for "religions from the East and force from Rome in the West."⁴⁸²

As we have just seen, Innis' account of Greece rested heavily on such terms as *logos*, fate, trade, metal currency, print culture and periodic change. The terms had specific meanings for Innis, referring either to a culture's adherence to a specific form of change, be it mechanical or systemic, or referring to Innis' estimation of a culture's information environment, and its role in promoting or stifling cultural innovation. In his study of Greece and other cultures Innis had viewed myth as a tool "for the unlocking of mysteries of civilization." Examining the emergence of myth and other cultural forms, be they in technology, commerce, or state administration, was one method of demonstrating a culture's successful management of its constituents, be they institutions pressing for greater freedom, or institutions pressing for greater constraint of agent activity. Innis would search for similar forms in his case studies of Egypt, Assyria and Rome to determine their success in reaching a "reconciliation between the static and dynamic approaches" to change and existence.⁴⁸³ He would also appeal to them to demonstrate that their rise and fall had in large part been determined by the principles of formal and final cause.

Innis divided his history of ancient Egypt into three periods. The first centered on Egypt's emergence as a unified kingdom, and the subsequent rule of an absolute monarchy in the period extending roughly from 4241 BC to 2750 BC. The second epoch involved a shift from absolute monarchy to priestly oligarchy, a shift that traumatized Egyptian society and ultimately led to its conquest by the neighbouring Hyksos from Syria in 1660 BC. The third epoch, following Egyptian expulsion of the Hyksos in 1580 BC, covered the return of a centralised

monarchy and the rise of the Egyptian empire. For Innis, the course of Egypt's millenia-long history could be reduced to two key factors: the kingdom's success in managing information; and the success of its institutions in using conceptions of change to bolster their position while undermining the power of their opponents.

In the first 1500 years of Innis' history it was Egypt's royal house that dominated Egyptian society, in part because of Menes' unification of Upper and Lower Egypt in 3315 BC, and in part because of the prestige accrued by virtue of the sidereal calendar. In 4241 BC Egyptian priests affiliated with the cults of Ra and Osiris, the gods of the sun and the Nile, discovered the periodic nature of astronomical phenomena. In turn, the priest-astronomers were able to correlate the rise of the star Sirius over the horizon with the imminent onset of flooding in the Nile delta. Given the success of the two cults in predicting the future behaviour of the Nile, and the dependence of Egyptian agriculture on the annual floods, both movements rapidly gained adherents. The prestige of the two cults, in turn, fell on the monarch, who was seen as the literal embodiment of both deities.⁴⁸⁴

The power of prediction was consequently identified with the monarch, a perception that was reinforced with the development of the concept of immortality, and its exclusive extension to the pharaohs. The fate of Egypt was seen as being controlled not only by the will of the living monarch but also through the intercession of his dead predecessors. The construction of the pyramids and mummification reinforced the idea of immortality in the public

mind. All in all, the discovery of mechanical change had worked to the good of Egypt's monarchy.⁴⁸⁵

And for a time, so too did the concept of emergent change. According to Innis one important by-product of the monarchy's funerary rites was the development of script. It quickly gained a mystic connotation in Egyptian theology commensurate with the doctrine of the *logos*: "The divine word was creative at the beginning of the universe and acted on gods, men, and things in a fashion reminiscent of Genesis and the Gospel of St. John." Writing was identified with the Egyptian god Thoth, the master of magic rites and formulae. He also came to represent the universe's emergent properties: "He represented creation by utterance and production by thought and utterance. The spoken word possessed creative efficiency and the written word in the tomb perpetuated it." ⁴⁸⁶

The moves of Egypt's monarchy to consolidate their power in Thebis and Memphis from the first through the fourth dynasties, however, eventually provoked the resentment of the populace, a development that was exploited by the priests of Ra in Heliopolis. In Innis' account Egypt's priesthood challenged and then limited the power of the monarchy by besting it at its own game. It usurped the monarch's control of mechanical change after 2540 BC by developing the solar calendar, a superior method for predicting the Nile's future behaviour. The doctrine of emergent change was also used to undercut the pharaoh's authority. Using the doctrine of the *logos*, Heliopolis reconceived the pharaoh's status. He was no longer the embodiment of divinity, but rather its instrument, a demiurge required to work within the constraints of existing law, not dictate it: ". . . the

doctrine was developed in which God was conceived of as an intelligence which has thought the world and expresses itself by the word, the organ of government, the instrument of continuous creation, and the herald of law and justice." ⁴⁸⁷

The contest between church and state eventually culminated in a period of political turmoil from 2360 BC to 2160 BC. The fourth dynasty collapsed and a new regime emerged in which the monarchy shared power with a noble and priestly aristocracy. Civil and religious rights were extended to the populace. The hope of immortality became available to all. Significantly, the reorganization of Egypt's political, social, and religious life was accompanied by a change in communication technology. According to Innis, papyrus emerged as a new medium of communication, while hieratics, a cursive form of hieroglyphics, emerged as a new means to represent information. The quantity of circulating information dramatically increased, in part because the nobility required its own bureaucracy, and in part because information was now easier to generate and disseminate.⁴⁸⁸

The effects on Egypt were profound, and mirrored Innis' description of Greece and Europe in similar circumstances. A secular literature emerged as a "marked increase in writing by hand was accompanied by secularization of writing, thought, and activity." With secularization came social division. Writing became a means to social mobility and eventually led to social rigidity. By 2000 BC the profession of scribe had become a restricted class. The secular orientation of scribe and noble eventually alienated Egypt's elite from the general populace. The cult of Ra deteriorated into little more than an overt political instrument for

manipulating society. The populace, in turn, embraced the now messianic cult of Osiris: "Osiris, the god of the Nile, became the good King slain for the salvation of men As an agricultural god he had faced death and conquered it."⁴⁸⁹

Egypt's situation, in Innis' eyes, deteriorated into a state markedly similar to the one which would be faced by the Hellenic kingdoms two millenia later. And just as they fell to the Romans, Egypt in its weakened state fell to the Hyksos from Syria. The state with its emphasis on stone and space fell prey to a cult and populace emphasising papyrus and time.⁴⁹⁰ It was a scenario that diverged from what Innis apparently had asked his readers to expect, and is a question to which we will return in our discussion of Innis' theory of media.

The 80 year occupation of the Hyksos ended in 1580 BC, in part due to the cult of Thoth which provided a rallying point for Egyptian identity and culture. The 18th dynasty was established in Thebes, according to Innis, and Egypt entered the Imperial phase of its history, expanding its control into Syria and Palestine. The Hyksos were completely destroyed in 1478 BC. And yet in Innis' account Egypt never managed to circumvent the problems that had led to the collapse of the regime in the first place. It reached the pinnacle of power in the 14th century under Amenhopis III, but never succeeded in bring its information practices under control, either with respect to quantity, or with respect to representation.⁴⁹¹

Under Amenhopis the market for papyrus expanded and a postal system was instituted. Not surprisingly given Innis' framework, his successors soon faced social division within and without Egypt. His successor Akhenaton attempted to institute the worship of Aten, the solar disk, as a means to unite the

empire: "Religious monopoly of the solar disk was designed to provide a common ideal above political and commercial interests, and above distinctions between Egyptians and foreigners."⁴⁹²

But the creative solution of monotheism ultimately proved a mistake, as it provoked priestly and popular opposition. Akhenaten's successor Tutankhamen was forced to renounce the solar cult, and was eventually overthrown. Egypt's failure to embrace a creative solution in Innis' estimation could be traced to its method of representation. To be sure, much of the priesthood's opposition could be traced to self-interest. It wished to retain the prevailing structure of Egypt's religious life, and their monopolistic control over the means of communication. It had an expertise in the prevailing system of hieroglyphs. Shifting to another system would alter that.⁴⁹³

But Innis also traced the resistance to a more fundamental problem, one that could be linked to the system of hieroglyphs itself. As we shall see in our section devoted to the Oral Tradition, one of Innis' core suppositions was that our perception of the world, and our capacity to change it, is in large part dependent on the devices we use to organise and represent it. The closer a system of written representation is to the sounds of speech, the greater the repertoire of words a user will have to conceive and reconceive the world. If the system of representation verges too far from oral methods of communication, however, users become progressively more hampered in their ability to lift percepts into concepts. For Innis monotheism was an abstract concept. By implication, there is a suggestion in his narrative that hieroglyphics hampered Egyptian theology.⁴⁹⁴

By explication, he would avow that hieroglyphics had hampered Egypt's capacity to engage in abstract thought, and that the writing system stifled creative endeavour in other areas of Egyptian life. While there were short bursts of creativity that accompanied the introduction of papyrus, Akhenaten's attempts to introduce a limited phonetic alphabet, and the limited use of cuneiform during the Imperial era, Egyptian literature and intellectual life remained stifled by the constraints imposed by hieroglyphics. Akhenaten's efforts to introduce cultural reforms consistent with a worldview of emergent change, suggested by Innis' reference to monotheism, the need for social unity, and new script to facilitate cultural emergence, fell by the wayside, as did Egyptian letters.⁴⁹⁵ From the 13th to the 10th centuries the priesthood's control over Egyptian scribes "brought a separation of speech and literary language and artificial composition." Infrequent innovations in style and composition soon lost their "first freshness and gave way to artificiality and bombast, with little regard for content."⁴⁹⁶

Hieroglyphs retained their religious significance in Egyptian theology, and any attempt to alter that fact provoked opposition from the priests and the populace. The conflict precipitated another struggle which culminated in the collapse of royal power and the rise of a priestly aristocracy, and Egypt's incorporation into a succession of empires ranging from Assyria to Rome. For Innis, Egypt's tragedy was that its culture hindered it from adapting:

Attempts of kings to escape were defeated by the power of monopoly. A monopoly control of communication defeated attempts to construct empires. The limitations of the Egyptian empire were in part a result of the inflexibility of religious

institutions supported by a monopoly over a complex system of writing.⁴⁹⁷

Mesopotamian empires were more fortunate in Innis' narrative because the region's cultures began a systematic effort to rationalize script that extended from the onset of the Akkadian empire in the 26th century BC through to the Assyrian empire's second wave of expansion in the 9th century BC. Assyria was distinguished in Innis' eyes for three reasons. The first was its "persistent attempts to build up an imperial organization. Administration was emphasised as a basis of imperialism."⁴⁹⁸

Second, the empire was a pioneer in setting up imperial free cities devoted primarily to commerce, but also secondarily to mediating the relations between state and cult. Finally, it was distinguished by its embrace of the invention that made administration and commerce over large areas possible, the Phoenician alphabet: "The spread of a more efficient system of writing which followed the discovery of the alphabet had profound implications for imperial organization."⁴⁹⁹

In the short term, Assyria's embrace of the alphabet and administration laid the basis for an imperial economy. The state became the beneficiary of increased industrial efficiencies resulting from a larger economy. The alphabet and imperial regulation also laid the basis for the Phoenicians and Arameans to emerge as the commercial peoples of the empire. (In the latter's case by necessity, since the Assyrians exiled them from their homeland.) With trade came the emergence of Aramaic as an international language, which further facilitated trade, as did the domestication of the camel, the use of standardized Babylonian

weights, and silver coins as a medium for exchange. In short, the empire was constructed on a system of regulation that encouraged emergent change. Its adherence to a form of monotheism suggested it, as did its recognition of the principle of number: "Commerce and the alphabet were inextricably woven, particularly when letters of the alphabet were used as numerals."⁵⁰⁰

The alphabet also enabled Assyria to maintain more effective political control over its disparate possessions:

With the development of writing and the use of parchment, officials in the empire could be kept under close supervision. They acted under detailed orders and were subject to immediate recall. Daily communication was established with the capital. The introduction of a new language and a new medium of communication was followed by more efficient administration.⁵⁰¹

While the alphabet initially heightened Assyria's political and economic control, ultimately it undercut it in two ways. To start, the state was not the only beneficiary of the new invention. The empire's disparate cults also adopted it, and used it to subvert Assyria's ambition to create a common imperial culture.

Towards that end, the empire had even adopted the extreme policy of exiling and resettling conquered peoples. Its purposes were thwarted, however, by religious institutions that used the alphabet to promote local practices and aspirations. As Innis concisely observed: "The God of the universe was nationalized and not the national god universalized."⁵⁰²

Conflict with the religious centre of Babylon led to the second factor undercutting Assyrian control. Prior to its conquest of Babylon Assyria had not

routinely dealt with an Assyrian priesthood, as the role of high priest and king were one in Assyrian religious practice. The monarch Sennacherib's inability or unwillingness to come to terms with the Babylonian priesthood led him to destroy the city in 689 BC, but his son Esarhaddon was forced to rebuild the city after assuming the throne.

Instead of directly controlling the Babylonian cult, Assyria tried to undermine Babylon's influence by making its own capital city a centre of learning. Sargon established a library in Dur-Shuruk, while his son expanded it in the new capital city of Nineveh. According to Innis, the ultimate effect of this strategy was the precise opposite of what had been intended by the Assyrians. The prestige of Babylonian religious and cultural thought did not diminish but increased as Assyrian scribes transcribed Babylonian and Sumerian works and shipped them to Nineveh.

And with the rapid influx of information a familiar pattern emerged for Innis. Overwhelmed by Babylonian cultural forms, creativity plummeted in Assyria. It failed to develop its own literary traditions. What is more, it abandoned its indigenous religious tradition that had rested on a doctrine of emergent change. Babylonian polytheism replaced Assyrian monotheism, in part because of the influence of Babylonian astrology.

In the 8th century and thereafter, Babylonian religious concepts enjoyed immense prestige due to the Babylonian priesthood's discovery of the periodic nature of celestial phenomena, particularly the moon. According to Innis the discovery of the "possibility of prediction gave Babylonia an enormous influence

on religious cults and led to the domination of fatalism based on scientific knowledge."⁵⁰³ It was not an auspicious ideology for Assyria to embrace prior to Esarhaddon's conquest of Egypt from 674-668 BC.

In Innis' estimation the incorporation of Egypt was a disastrous decision. While it provoked a short-term renaissance in art and literature in Nineveh, due to the city's exposure to Egyptian letters, the influx in information was accompanied by growing instability in the empire. Regulation of one religious centre -- Babylon -- had proven a manageable proposition for Nineveh. Control of two centres, with the incorporation of the city of Thebes, proved impossible.

It was a classic case of imperial overstretch, and the ability of Assyria's bureaucracy to maintain stability declined during the reign of Ashur-banipal. The tension between freedom and constraint, centralisation and decentralisation, was finally broken with Babylon's successful revolt in 625 BC. The empire ended 13 years later with the destruction of Nineveh by the combined armies of Babylon and Media.

Assyria was not the only empire in Innis' narrative that collapsed in the wake of rigidities imposed by excess circulating information and embrace of a fatalistic worldview. Rome would suffer the same outcome. According to Innis problems emerged in the period between Rome's incorporation of the Hellenistic kingdoms into its domains and the transformation of the Republic into an Empire by Augustus. While it could be said that Rome conquered Greece, it could equally be said that Greek culture conquered Rome. In fact it overwhelmed Rome, as Rome's indigenous legal tradition was forced to incorporate stoic

conceptions including the world state, natural justice, criticism of custom, and the conception of man as a rational social being, the basis of law. The only reason Roman jurisprudence was able to retain a creative impulse at all was its embrace of shorthand, a move which facilitated control of increasing quantities of information, and in Innis' words bridged "the gap with the oral tradition."⁵⁰⁴

Roman public life was also influenced by Greek thought, much of it spread through books, and unlike the field of law there was no alternate system of representation available to mitigate its influence. In the field of popular culture, a familiar pattern emerged for Innis as the advent of cheap entertainment drove intelligent Romans from the theatre: "The effect of writing was evident in every phase of cultural life."⁵⁰⁵ Once again popular and elite culture diverged, not only in the arts, but in religious practice as well, as Romans turned to Mithraism and other redemptive religions while their liberties were being constrained by the state.

In politics, Caesar embraced bureaucratic models of governance that over the long term proved disastrous. His policies weakened the Senate, and sapped individual initiative and autonomy at the municipal level. With bureaucracy came a rigidification in law, and a neglect of the emergent conception of change implied by commerce:

The written tradition dependent on papyrus and the roll supported an emphasis on centralised bureaucratic administration. Rome became dependent on the army, territorial expansion, and law at the expense of trade and an international economy.⁵⁰⁶

The problem was further aggravated by the trade Rome did conduct between 50 AD and the fourth century. In its commerce with India Rome allowed its gold and silver reserves to become completely depleted. Without their presence to effect a catalytic role in commerce, trade collapsed. In the centuries in which the conception of change implied by trade became less and less important, the role of mechanistic change in Roman life and theology became steadily more important:

As a result of the decline of trade Roman religion escaped from the demands made upon Greek religion for adjustment in relation to time Everything represented the completion of that spoken by the gods or a *fatum*, and the results were evident in various aspects of Roman culture.⁵⁰⁷

The emergence of Christianity first as a fringe cult and then as the official religion of the empire was not sufficient to undo the damage effected by neglect of trade and emergent change in general. Despite bringing a different worldview, and introducing the new medium of parchment, the church was unable through default or design to bring about a resurgence of the Oral Tradition or prevent the Western Empire's continued deterioration. It collapsed with the sacking of Rome in 410 BC.

III

In studying the histories of ancient empires, Innis' purpose had been to establish the importance of cultural schema in human history. As Barrington Nevitt notes, Innis in fulfilling his second task had used "history like a laboratory to discover old process patterns having new relevance."⁵⁰⁸ Such patterns had proven to be important determinants in the capacity of past cultures to adapt to changing circumstance, and survive. But in reaching this conclusion, Innis raised a third set of questions of equal importance. Do cultural schema operate autonomously? Or can they be made to serve human purpose, with the foremost aim being the maintenance of cultural stability and creativity? Innis raised this concern shortly before he died in 1952 in a letter to his colleague W.T.

Easterbrook:

I am still worried about the problem of intelligence or the ability to get out of the particular rat race that civilization has run into or the possible toleration of a civilization which makes people think sufficiently to at least make possible an escape.⁵⁰⁹

While worried, Innis nevertheless believed it possible for cultures to transcend their cultural "rat races" through resort to the Oral Tradition. The second task of his two studies would be to provide a full description of its characteristics. For Innis, the Oral Tradition was a label to describe the types of information environments that historically had supported creative thought. It was also a statement on the role language plays in the construction of the mental models that humans use to interpret their immediate environment. At base, it was a statement that thought itself operates according to the tenets of formal cause.

To supplement his theory of the Oral Tradition, Innis offered a number of propositions. The first was that human thought in essence is formless flux. For effective expression to take place, thought had to be subjected to constraint, a constraint provided by language:

In the words of [Ernst] Cassirer language transformed the indeterminate into the determinate idea and held it within the sphere of finite dimensions. The spoken word set its seal on and gave definite form to what the mind created and culled away from the total sphere of consciousness. . . . Herbert Spencer wrote that 'language must be regarded as a hindrance to thought, though the necessary instrument of it, ...'⁵¹⁰

Note the similarity between Innis' formulation and the tenets of information theory listed in the previous chapter. For potential information to become actual information an ordering process must be imposed. Just as an encryption process is required to translate television noise into an intelligible signal, the constraints of language are required to translate mental noise -- the total sphere of human consciousness -- into an intelligible communication, be it oral or written.

Innis' second proposition was that structures of thought mirror the structures imposed by language. Popular conceptions of time, for example, are "influenced by language which constrains and fixes prevalent modes of thought."⁵¹¹ The structures of language were comprised not only by phonetic and grammatic rules, but also by stylistic ones. Accordingly, genres of expression such as poetry play a role in mediating perception and expression.⁵¹²

However, while grammar mediated human perception, it did not totally determine it in the way suggested by current post-Modern critical theory. Innis' intent was not to announce the death of the human subject.⁵¹³ Rather, his third proposition was that a distinction had to be made between the prescribed rules of language and the agent's use of language. His point was similar to that made by the Swiss linguist Ferdinand de Saussure who differentiated between the formal rules of language, or "langue", and the individual's use of the same, or "parole".⁵¹⁴

For Innis, agents were constrained by the rules of language, but were not determined by them. On the contrary, agents by their use and abuse of language contributed to the evolution of language over time: "But the speech of the individual continued in a constant struggle with language and brought about constant adjustment. 'The history of language when looked at from the purely grammatical point of view is little other than the history of corruptions' (Lounsbury)."⁵¹⁵

Innis' next supposition was that such rules have the capacity to generate modes of expression and thought that are complex. Innis' understanding of the term coincides with the contemporary definition of complexity, namely systems composed of components that are coordinated, interconnected, and organised into a complexly differentiated hierarchy.⁵¹⁶ For example, while describing the evolution of the Greek epic poem Innis noted that:

Nilsson describes the epic style as a conventionalized outcome of a long evolution extending from the thirteenth and twelfth to the ninth and eighth centuries. The great epics were probably developed out of lays constantly retold

and amplified. Old ballads were replaced by combinations of a number of episodes into a unity of action. The epic was characterised by extreme complexity and unity.⁵¹⁷

Fifth, Innis argued that an agent's capacity to change his or her perception was dependent on the complexity of the linguistic environment in which he or she is immersed. The greater the degree of differentiation within language -- the more it is defined as a hierarchy of components, systems of components, and systems of systems of components -- the greater the capacity of agents to produce models that better approximate their world. In this respect, cultures governed by the Oral Tradition had a marked advantage, since they were dependent on stylistic devices such as rhythm and metre to facilitate memory: "Poetry is significant as a tribute to the Oral Tradition. Sapir has noted that 'many primitive languages have a formal richness; a latent luxuriance of expression that eclipses anything known to modern civilization.'⁵¹⁸ Cultures that possessed complex linguistic environments were more likely to adapt to changing circumstances, since they had a greater array of raw materials for revising existing schema, formulating new ones, and exploring their implications.

Innis illustrated his point by offering a sixth proposition, that disparate forms of written representation -- by they ideographic, pictographic, syllabic or phonetic -- impose constraints upon thought that differ in their complexity and flexibility from those that pertain in the Oral Tradition. Writing systems, consequently, mediate perception and behaviour.⁵¹⁹ The agent's capacity to retain the creative potential of the Oral Tradition -- to formulate and explore the

implications of new concepts -- is dependent on the writing system adopted. The closer any system of representation is to the phonetic level of language, the more it is in accord with the formal complexity of the Oral Tradition, and the greater the likelihood that the resulting written documents will emerge as better models of the objects they purport to represent. In 1946, Innis noted in his Idea File that the alphabet "facilitated development of ideas" and enabled a "closer approximation to reality than crude pictographs or images of organised religion", such as hieroglyphs.⁵²⁰ The impact of signs was such that it determined an agent's capacity for abstract thought. Innis believed that pictographs and other iconic forms of representation were incapable of producing anything more than rough models of percepts. For this reason cultures employing such signs were incapable of lifting percepts beyond the point of analogy. They could not formulate a general concept.

Innis' writing consistently identified hieroglyphics and pictographs with the concrete. In Mesopotamia, for example, before cuneiform symbols were identified with the syllabic level of language, Innis noted: "Concrete pictographs involved an elaborate vocabulary with large numbers of items."⁵²¹ The Chinese faced a similar problem with their use of pictographs, one that hindered their capacity to generate an abstract model of time:

It has been argued by Marcel Granet that the Chinese are not equipped to note concepts or to present doctrines discursively. The word does not fix a notion with a definite degree of abstraction or generality but evokes an indefinite complex of particular images. It is completely unsuited to formal precision. Neither time nor space is

abstractly conceived; time proceeds by cycles and is round; space is square.⁵²²

Only cultures identifying signs with syllables and phonemes could generate models of concrete phenomena of sufficient detail that common patterns in disparate phenomena could be perceived. According to Innis the identification of common patterns emerged as soon as language was rationalized to the syllabic level of language in Mesopotamia: "Pictographs and ideograms took on abstract phonetic values, and the study of script became linked to the study of language."⁵²³ New forms of linguistic script heightened Babylon's competence in geometry, enabling it to move from concrete problems of measurement to an abstract conception of Euclidean space. It also enabled the Hebrews to transform their theology from one in which divinities were associated with a concrete activity to monotheism and a universal ethics.⁵²⁴

For Greece the alphabet enabled Thales of Miletus, and other Ionian philosophers to move beyond the linkage of percepts to create analogies of limited application. Instead, the Greeks created general concepts, and outstripped the Egyptians, whose geometry was constrained by their reliance on hieroglyphics, architecture and other visual forms of representation:

But whereas in Egypt mathematics like ethics and medicine had been developed empirically and stopped short of philosophy, it became to Thales a means of discarding allegory and myth and advancing universal generalisations. . . .Opposition was evoked in Anaximander (about 611-547 B.C.), a cartographer, who sought for a more general conception unlimited by qualities. Geometry was

used to develop a conception of the earth and of the universe.⁵²⁵

Finally, while Innis emphasised individual agency, he did not see cultural schema as the product of individual effort or arbitrary preference. Rather, new schemas came out of collective effort involving interaction with one's peers, and joint inquiry into the surrounding environment. As we shall see in our study of Innis' theory of media, he believed schema change was the product of conscious attempts to model nature. While natural phenomena will not submit to arbitrary constructs, there are select points in our interaction with nature where it will, in the words of Ernst Cassirer, seems to meet us half-way, will suddenly map itself with a construct of our devising.⁵²⁶ For Innis, constructs that lasted were the product not merely of individual invention, but interaction, with nature, and with colleagues and peers. Schema change is an emergent property of the Oral Tradition. In 1950 he noted in his *Idea File*:

"Out of frequent and close conversation and much social intercourse a light is of a sudden kindled in the mind, as from a fire that leaps forth, which when once generated keeps itself alive' (Plato).⁵²⁷

Innis pointed to three factors to explain Greece's marked success as a practitioner of the Oral Tradition. The first was its adaptation of the Phoenician alphabet in the 8th century BC to meet Greek needs, particularly the identification of letters with vowel sounds. Semitic alphabets prior to that point had only identified letters with consonantal sounds, but Innis argued that the Greek alphabet's more precise fit with the phonetic level of language afforded the

Greeks a unique advantage.⁵²⁸ In effect, it provided more building blocks and hence better models:

They permitted the expression of fine distinctions and light shades of meaning. The Greek language 'responds with happy elasticity to every demand of the Greek intellect . . . the earliest work of art created by the spontaneous working of the Greek mind'.⁵²⁹

Greek adherence to the Oral Tradition was also supported by its limited access to papyrus, which forestalled its rapid immersion into the Written Tradition.⁵³⁰ For a time, it managed to escape the consequences of the information-saturated society described by Albert Schweitzer: "Our spiritual life is disorganised for the over-organization of our external environment leads to the organization of our absence of thought."⁵³¹

Finally, Greece by virtue of its distance from Mesopotamia managed to escape being overwhelmed by the culture of Mesopotamia. Unlike the imperiums of the east, it managed to avoid being overwhelmed by the cultural riches of Egypt and Babylon, and accordingly it escaped "the formal patterns of the Orient."⁵³² Instead, Greece by virtue of its cultural independence was able to generate "the one entirely original literature of Europe", most specifically forms of poetry such as the epic and lyric with the formal and cognitive complexity these forms implied.⁵³³

Greece benefited from the Oral Tradition first because it required users to memorise extant works, thereby giving users more building blocks with which to actively model the world in ways that accorded with their experience. According

to Innis, Socrates in Plato's *Phaedrus* realized that a society with a superfluity of information lost the capacity to constructively engage with it. Citing the Egyptian god Thoth, Socrates argued that writing is "an aid not to memory, but to reminiscence, and you give your disciples not truth but only the semblance of truth. . . . [T]hey will be hearers of many things and will have learned nothing; they will appear to be omniscient and will generally know nothing; they will be tiresome company, having the show of wisdom without the reality."⁵³⁴ Socrates called for a better form of communication: "'I mean an intelligent word graven in the soul of the learner which can defend itself, and knows when to speak and when to be silent'."⁵³⁵

Greece also benefited from the Oral Tradition by developing a literature rich in internal complexity. Recall in our discussion of information theory the importance of localised constraint in the emergence of *complex adaptive systems* and messages. In both cases, the capacity of component systems to self-organise into systems, and systems of systems, exponentially increases the potential number of combinations a system can visit. There are more words than letters, more sentences than words.

Innis argued that the Greeks exploited this capacity of language by developing epics that were in effect systems of components that in modern parlance displayed differential persistence. It was a strategy borne as much out of necessity as design:

The memory took the place of logical processes in writing and supported an immense burden of vocabulary and grammatical complexity with the

help of verse, metre, rhyme, and proverbs. 'Poetry is the chain of the stories' (Arab saying). What was once well said was not to be changed but repeated in the very words of its original author.⁵³⁶

The virtue of such a system, according to Innis, was its adaptability. The hierarchical nature of poetry allowed not only formulation, but re-formulation in response to changing individual and social experience: "Minstrels developed epic poems in hexameter which involved rigidities but permitted elasticities facilitating adaptation to the demands of vernacular speech."⁵³⁷ Components could be assembled and reassembled, and the semantics of the components adjusted to meet the demands of the new distributed whole. Referring to the Oral Tradition that preceded the composition of the Hebrew Bible, Innis noted:

The oral as compared with the written transmission of tradition was inherently more consistent and logical in its results because of the constant sifting, refining, and modifying of what did not fit into the tradition. In the cumulative effects of the oral tradition the pieces of an edifice were carried to another site and worked into the structure of a different novel. Fact shifted into legend, legend into myth. Facts worked loose and became detached from their roots in space and time. The story was moulded and remoulded by imagination, passion, prejudice, religious presumption, or aesthetic instinct.⁵³⁸

The Bible emerged, in other words, in a pattern similar to the one we have noted for the autocatalytic set. Just as formal cause regulates the constituent processes of the set, formal cause altered the significance and semantics of the "edifices" that comprised the written version of the Hebrew Bible.

While the Oral Tradition served the cause of myth in ancient Israel, according to Innis it served a much different function in Greece, enabling Greek philosophers to articulate a conception of nature governed not by divine caprice but rather by law. The Homeric poems were themselves revisions of earlier myths featuring nature gods and the pervasive influence of magic: "New types of literature reflected the efficiency of the Oral Tradition in expressing the needs of social change."⁵³⁹

According to Innis Homeric literature in response to such needs began the process of humanising the gods, while later literature sublimated the importance of magic, and emphasised the importance of human ethics. The cumulative effects of these changes was an emphasis on law, and the subsequent separation of science from religion in Greek society:

Anthropomorphism and the absence of magic and limitations on the power of the gods assumed rationalism and the necessity of finding order and coherence in the world. "The Greek view of the relation of men to the god was mechanical." Decline of belief in the supernatural led to the explanation of nature in terms of natural causes. With the independent search for truth science was separated from myth. "By his religion man has been made at home in the world." The minstrels were followed by the rhapsodists and in turn by the Ionian philosophers. The latter built up where the former pulled down.⁵⁴⁰

The principle of localised constraint, in other words, enabled the Greeks to revise their constructs of change in the same way that the principle of number had enabled Pythagoras and his contemporaries to revise their constructs of change. It

should come as no surprise, therefore, that Innis identified the two by referring to the time series as a constituent of the Oral Tradition. As we saw in the previous chapter, Innis argued in *Political Economy in the Modern State* that the juxtaposition of time series and multiple domains of history from the perspective of space offered social scientists valuable insights. Through interpolation of long-term patterns embedded in economic and social data, social scientists could model and characterise the behaviour of social systems. The exercise had a second potential benefit, correction of bias through demonstration that regional and national economies were part of a larger international whole. Time series demonstrated that study of the economy from a purely national perspective was as absurd a proposition as studying meteorology and assuming the weather stopped at the Canadian border.⁵⁴¹

In his two communication studies, Innis argued that poetry conferred on the ancients a similar advantage, particularly in the field of theology. Time series and poetry were functionally equivalent in Innis' eyes. Just as time series referred to phenomena governed by local constraints, poetry referred to chains of stories composed by disparate authors, stories that retained their formal integrity even as they were incorporated into the whole. The "temporal order in imagination" in poetry, the process of combining and recombining religious insights, enabled the ancients to overcome religious chauvinism. The Hebrews used it to conceive of a god that transcended borders:

The oral tradition and its relation to poetry implied a concern with time and religion. "The artist represents *coexistence in space*, the poet *succession*

in time" (Lessing at the University of Berlin, 1810). The oral tradition reflected the positive influence of Egypt in the name of Moses, the doctrine that God is the sole creator and the formula from which his name Yahweh is derived, the concept of a single god and the establishment of doctrine based on monotheism, and the recognition of the international, cosmic character of the reigning deity.⁵⁴²

In other words, the Oral Tradition offered the means to identify shortcomings in established modes of perception, and the capacity to generate models that provided a better account of observed phenomena. Time series in the form of numeric measurement and poetic component enabled political economists and theologians to perceive systems that extended beyond national boundaries. The components of poetry enabled Greek philosophers to divorce the study of nature from myth and to identify regularities in natural phenomena.

IV

The Oral Tradition at base, then, was an assertion of human freedom. It is humans that manipulate structure, not the reverse. It is humans that have the capacity to create information environments that not only permit the construction of precise representations of the environment, but also encourage their interrogation and re-formulation. Creative thought, Innis averred, rested on a communication environment governed by formal cause.

The assertion of human freedom in the Oral Tradition, however, raises pertinent questions regarding Innis' theory of media. In "The Bias of

Communication" Innis argued that media influence the worldviews of cultures in a manner akin to efficient cause. The material properties of media push empires toward a preoccupation with space, and political concerns, or time, and religious concerns. On the one hand, Innis seems to present his readers with a philosophy of history based on freedom. On the other, he apparently presents a vision of technological determinism.

Aside from the problematic relationship between Innis' formulations on the Oral Tradition and media, his writings also suffer from apparent discrepancies between his proffered generalisations regarding the effects of media and the effects described in his narration. Stated simply, Innis seemed to delight in blithely contradicting the assertions offered in both studies. Paper and papyrus, we are told, due to its portability suggests a bias towards space. Stone, due to its durability, suggests a disposition towards time. The problem is that Innis' narrative presents a number of examples where media do not perform as expected. In Egypt, for example, papyrus works to the advantage of the priesthood, the institution aligned with time, while stone serves the interests of the state. The same apparently skewed arrangement is found in his account of ancient Israel. If you were an Israelite king, according to Innis, and the Almighty had it in for you, you received a certification of his displeasure from the local prophet, in writing, and on papyrus. In Assyria, the employment of papyrus and the alphabet served Imperial aims, but ultimately undercut them as papyrus supported the disparate cults within its dominions. As Innis concisely observed: "The God of the universe was nationalized and not the national god universalized."⁵⁴³

How might these discrepancies be resolved? Barring the assumption that Innis' thinking was simply inconsistent, the question is ultimately impossible to resolve from the standpoint of efficient cause. Leaving aside the issue of which variant of change Innis would have prioritised in the process of schema change, had he identified his theory of media with efficient cause, it cannot account for the indeterminate effects of media described by Innis. As we saw in Chapter One, efficient cause leads to linear outcomes, not unpredictable ones. The discrepancies can be resolved, however, first by demonstrating that Innis identified his theory of media with systems governed by formal and final cause. They can also be resolved by demonstrating that such systems gravitate towards multiple outcomes, that Innis knew this, and that in the interactions between cultures and media Innis limited the potential outcomes to a finite three, an orientation towards space, time, or space-time.

Innis began his identification of communication technologies with emergent systems first by emphasising that the nature of the relationship between agent and medium was one of interaction. Influence flowed in both directions. In the preface of *The Bias of Communication*, Innis indicated that the purpose of both communication studies was to reflect upon a question posed by James Ten Broeke, his respected former philosophy professor from McMaster University: "Why do we attend to the things to which we attend?" Such reflections according to Innis could be profitably based upon the study of communication technology: "They emphasise the importance of communication in determining 'things to

which we attend' and suggest also that changes in communication will follow changes in 'the things to which we attend'."⁵⁴⁴

Through interaction, agents and media self-organised into systems that displayed emergent properties. The persistence of the pattern induced Innis to posit a philosophy of history characterised by "periods of crises in which adjustments in the old structure were painfully made and a new pattern created."

⁵⁴⁵ It was the same systemic view of cultural change he described in *Political Economy in the Modern State*. History was akin to the formation of monopolies and the procession of the business cycle. It proceeded in waves rather than straight lines:

An extension of cyclical theory may seem to have been carried too far but the neglect of the field of communication in studies of cycles warranted a consideration of the extent to which monopolies of knowledge collapse and extraneous material is lost, to be followed by the prospect of an emphasis on a fresh medium of communication and a fresh approach."⁵⁴⁶

In other words, human agency and media constraint are both seen as operating within a systemic view of history, a point Innis reinforced by identifying his theory with the concept of formal cause. Recall that in the introduction to *Empire and Communication* Innis made clear his intent to use conceptual tools from his studies of staple industries, particularly those highlighting that trading networks had historically changed the internal economic organisation of their constituents, be they states, colonies or business firms. The allusion suggests that Innis intended to relate his theory of media to a schema in

which a larger distributed whole regulates the behaviour of its parts. Innis is identifying his theory with systems governed by formal and final cause.

How did Innis translate these insights into a conception of systems defined by multiple possible outcomes, and in turn to a theory in which the same medium can betray a bias towards space, or towards time? To find out, we shall need to learn more about the concept of final cause. In our description of *complex adaptive systems* in Chapter One, we identified final cause with the concept of purpose, suggesting that even rudimentary systems such as amoebas are governed in their interactions with the environment by schema formed through the process of natural selection. Even in simple systems, such schema are never static, but adapt -- "learn" -- in order to protect the formal integrity of the system. Consequently, amoebas cannot be classified as passive conduits of matter and energy. They "know" for example when detecting concentrations of glucose to swim in the direction of higher concentrations in order to obtain food.⁵⁴⁷

Our purpose in referring to final cause here is to appeal to its insight that emergent systems progress toward a fixed number of states or ranges of behaviour. In the wake of the success of Newton's celestial mechanics in the 17th century, the doctrine fell into disrepute because it suggested change was not a function of events occurring in time through efficient cause. Instead, it appealed to the pull or agency of a force operating either forward or outside of time. For modern philosophy, it smacked too much of purpose in the form of divine intervention, and was abandoned.⁵⁴⁸

Recently, however, the concept has enjoyed a resurgence because it has come to be associated with the process of self-organisation, which of course operates *in time*. In the science of complexity, final cause is identified with the concept of *the attractor*. Self-organising systems are portrayed as progressing towards a terminus point, a meta-stable state or pattern of behaviour that persists barring outside influence. This state or pattern of behaviour is the system's *attractor*.

Self-organising systems are characterised by the presence of multiple potential *attractors*. Given that the system is governed by a combination of constraint and contingency, environmental constraints limit the number of potential *attractors* a system can visit. The system is governed by a regime of probabilistic change. When a system self-organises, any one *attractor* can be selected. Only one is selected. While the system's constraints make the selection of one *attractor* more probable than its alternates, there is no way to predict the system's future trajectory. As the system interacts with the environment, the combination of environmental constraint, contingent circumstance, and the system's history determine which *attractor* will be selected. The process of self-organisation can be seen as the selection and gravitation of a system towards its *attractor*.⁵⁴⁹

The economics of W. Brian Arthur provides a more concrete expression of the *attractor* concept, and also affords the advantage of linking it to the concepts of increasing-returns and market equilibrium, additions that will prove useful in our review of Innis' writings on media bias. In the discipline of economics, a

system has reached its *attractor* when it reaches equilibrium, whether that equilibrium refers to the spatial distribution of firms from a particular industry amongst competing regions, or to market share between competing products or technologies.

Recall from our discussion in Chapter Three that economic systems can be governed either by diminishing or increasing-returns. Increasing-returns are positive feedback mechanisms that determine the market share of competing products. A classic example provided by Arthur is the emergence of VHS format as the dominant standard of the VCR market. Both VHS and Beta formats started with roughly equal market share, but early small gains in the sales of VHS recorders initiated a process of cumulative causation that initially redounded in the format's favour. Video outlets began stocking more pre-recorded VHS tapes than Beta, which in turn caused new consumers to opt for VHS players. Since systems governed by increasing-returns are characterised by multiple possible outcomes, Arthur argues the selection of the VHS format was not inevitable. Beta was considered by many experts as the superior product. It could have emerged as the dominant product had its proponents pursued a different sales strategy and enjoyed better luck.⁵⁵⁰

The distribution of market share in systems governed by increasing-returns is not always the all-or-nothing distribution implied by the VCR market. Arthur notes that systems can also reach points of equilibrium where competing products reach a stable share of the market. In a competition between Car A and Car B, for example, Car A might capture 65% to Car B's 35%. Given the same

initial conditions but a different history, however, Car B's market share might have reached a 90% share to A's 10%. What is significant, here, however, is that the market can only distribute share in a finite number of ways. There are only so many *attractors* the system can reach. Stated more concretely, a market might divide into shares of 65% to 35%, but never 70% to 30%. ⁵⁵¹

Arthur's work is also useful since it raises the possibility that Innis translated this aspect of increasing-returns economics onto his theory of media. The issue of multiple outcomes was well known in the field of economics. Alfred Marshall discussed the possibility of multiple possible equilibria in his influential *Principles of Economics*, a work with which Innis was familiar. While most of Innis' contemporaries avoided the topic, in part because it suggested the future behaviour of economic systems could not be mathematically represented, his embrace of the theory is important. It raises the possibility that Innis saw media bias as an emergent property of the interaction between an agent and a medium. As an emergent system, Innis saw it as being governed by increasing-returns with multiple potential outcomes. Within this framework, he saw it as perfectly plausible for a specific medium such as papyrus to display either a bias towards space or time, as bias was an indication of the equilibrium point or monopoly towards which the system had moved. The equilibrium point the agent-medium system selected depended on the circumstances of the medium's use. If Innis' intent was to graft the concept of multiple outcomes onto his theory of media, then the idea of a specific medium such as papyrus displaying a bias toward space or time, depending on the circumstances of its use, emerges not as a bizarre idea,

but as one that is perfectly plausible. The problem is to find a means to demonstrate that this was in fact his intent.⁵⁵²

One way this possibility might be pursued is by viewing Innis' media studies as an example of "inventory science". In *Inventing Canada* Suzanne Zeller has noted the affinity of Innis' staple studies with inventory science, the practice of "mapping and cataloguing of resources and other natural phenomena" which characterised Canadian scientific pursuits in the 19th century. The method of taxonomy developed by Carlus Linnaeus is one example of such a science. Living forms are catalogued into categories ranging from those that address general traits, such as kingdoms, and genera, to those that address more specific traits, such as species.⁵⁵³ Zeller's observation is one that can be applied to Innis' media studies, not only based on an observation of his practice, but also due to his explicit reference in the *Idea File* to space and time "as both categories of communication."⁵⁵⁴

Why is it important to view Innis' work as an exercise in classification? As James Larson has noted, the very act of classification suggests core suppositions about the phenomenon under study.⁵⁵⁵ If Innis' views regarding inventory science can be retrieved, they may provide the evidence needed to suggest his attachment of the concept of multiple outcomes to his theory of media. Innis' views on inventory science can be unearthed by examining two extracts that explicitly address the topic. The first is contained in *Empire and Communications* in which Innis makes reference to Aristotelian science. In it, Innis explicitly

identifies the classification sciences with final cause, and suggests they are governed by a variant of change that is neither purely random, nor universal:

The biological sciences emphasised classification, which, in the words of Whitehead, stood half-way between the immediate concreteness of the individual theory and the complete abstractions of mathematical notions and involved an emphasis on logic. . . . As a biologist rather than a physicist he leaned toward a final cause.⁵⁵⁶

The second reference is contained in a 1951 entry into the *Idea File*, where Innis referred to the philosopher Immanuel Kant's efforts to assert the autonomy and methodological independence of biology from physics in *The Critique of Judgement*. Kant's purpose was to reconcile a world governed by universal law with a world in which individual agency or purpose existed. Innis noted that "*Critique of Judgement* to prove no antinomy between the two forms of order":

(1) to refer phenomenon to universal dynamic principle of causality and (2) to regard phenomenon from point of view of purpose and to organise and arrange them accordingly. Kant rejected solutions of both Aristotle and Spinoza -- i.e. biology and mathematics. Principle of formal purposiveness and Kant's conclusions as to adaptation of nature to our judgement -- in formal purposiveness the logician of Linnaeus' descriptive science.⁵⁵⁷

In each reference to classification science Innis refers to "a logic." What did he mean by these statements? Ernst Cassirer's *The Problem of Knowledge*, from which Innis transcribed the entry into the *Idea File* verbatim, offers a means to discover his definition of the term. It also provides a basis to suggest that Innis

saw the logics associated with Aristotelian and Linnean biology as the same. Both are identified by Cassirer as belonging to the "logic of class concepts", which provided "an indispensable means to the knowledge and scientific description of natural forms."⁵⁵⁸ Innis' reference to logic refers to the efforts of the philosopher Immanuel Kant to establish the logical foundations of biology. According to Cassirer, Kant's purpose throughout his career had been to locate the *a priori* suppositions adhered to by the various domains of human knowledge. Each discipline or set of disciplines, Kant argued, adhere to a set of fundamental suppositions that enable them to synthesize individual percepts into a domain that forms the basis of study. As we shall see, the *a priori* suppositions that Kant unearthed for the discipline of biology would serve as the basis for Innis' belief that media could display different biases at different times.

In the discipline of physics, Kant argued, phenomena were bound by a logic of relations. Within this variant of logic, "nature" exists as a construct because perception is governed by three synthetic concepts: substance, causality and reciprocity. Without them, the universe emerges as a chaos, not a cosmos demonstrating order in space and time. They are a necessary prerequisite for experience. From them, all subsequent constructs of nature can be deduced. In the *Critique of Pure Reason*, Kant argued that Newton's *Principia* provided a case study of the "general laws of understanding" in application.⁵⁵⁹

The problem, however, was that the suppositions outlined in *The Critique of Pure Reason* could not account for the purposive behaviour of biological organisms. The principles contained in the logic of relations could not account

for the fact of self-regulating behaviour demonstrated by living beings. In his *Critique of Judgement* (1790), therefore, Kant made an attempt to establish the autonomy and methodological independence of biology without sacrificing the coherence implied by the suppositions associated with physics.⁵⁶⁰

According to Cassirer the dichotomy between efficient cause and purpose is one that philosophers have attempted to reconcile since the time of Aristotle. Aristotle tried to force a unity by subordinating physics to the principles governing vital phenomena, while Spinoza insisted all natural phenomena be explained mathematically and mechanically.⁵⁶¹ For Kant, however, the stance of both did violence to reality by erasing the distinction between animate and inanimate matter. Spinoza's formulation was no solution because it ignored the self-regulating purposive behaviour characteristics of living organisms: "An organised product of nature is that in which all is reciprocally end and means."⁵⁶² Accordingly, in 1790 Kant proposed to establish a complementary set of governing rules for biology, rules that would enable observers to make a "synthesis of rules according to concepts."⁵⁶³ Kant's purpose was to establish a set of synthetic concepts that would complement, not contradict, the universal conditions of natural knowledge identified in *The Critique of Pure Reason*. The problem Kant faced, according to Cassirer, was finding a means to accomplish his task: "If biology is not to be a 'state within a state,' it must conform to these laws on all points. But how is an 'autonomy' of biology to be attained in this way, a self-legislation that will not appear simply foreign to the principles upon which mathematical physics is founded?"⁵⁶⁴

Kant bridged the divide, according to Cassirer, by declaring purpose and cause two separate modes of knowledge relating "to problems in distinct fields that must be carefully kept apart." The mode of cause related to "knowledge of the temporal succession of events." Such events required a set of synthesising principles entirely different from those required for the mode of purpose, which concerned itself with the structure of living organisms. Such structures were distinguished from their inanimate counterparts because each one formed "a unified self-contained structure", a whole "so formed that it determines the properties of its various parts. Then nature ceases to be an aggregate and becomes a system."⁵⁶⁵

In Kant's words: "The principle of purposive combinations and forms in nature is at least, then, one principle more for bringing the appearance under rules, where the laws of mechanistic causality do not suffice."⁵⁶⁶ By asserting the incommensurability of the two forms of knowledge, Kant believed he had avoided creating an antinomy between biology and physics. The dichotomy between purpose and cause had no meaning since his critiques were constructed on separate principles. He also avoided the antinomy by declaring the synthetic concepts associated with physics and nature as "constitutive," meaning that it could be proven *a priori* that human perception had to be governed by such concepts for "nature" to be perceived as a unity. By contrast, the synthetic principles in the *Critique of Judgement* were deemed as merely "regulative," useful heuristics that could be used to investigate natural phenomena. Their truth

could not be determined on an *a priori* basis. Their confirmation rested only on experience.⁵⁶⁷

With his justification for a distinct discipline and methodology for biology in place, Kant proceeded with his task of unearthing the core suppositions upon which the science of biology then rested. Here he relied on the defining biological work of the 18th century to inform his reasonings, the writings of the botanist Carlus Linnaeus. According to Cassirer, the importance of Linnaean biology was two-fold. First, it applied the Aristotelian logic of class concepts, a logic distinct from the logic of relations then being applied in mathematics and physics. The whole of nature was arranged in a hierarchical schema in which organisms were classified according to a general trait -- a genus -- and then classified with greater precision at the subordinate -- or species -- level through identification of more specific traits. Many organisms fit into the generic category of "dog". Fewer still fit the specific category of "dachshund". The important point here was that Linnaeus was applying not a logic of relation but rather one of distinction, in which "every individual was assigned its determinate place in the whole scheme."⁵⁶⁸

Second, Linnaean biology according to Cassirer provided the clearest, most precise, and most comprehensive classification of biological phenomena ever attempted: "At one stroke the manifold variety of these forms, which were incapable of being seen in any one view, were classified as members according to a regular scheme." Linnaean biology emerged as the exemplar application of the

logic of class concepts, and as we have seen an indispensable tool for biologists.⁵⁶⁹

For Kant, the key challenge was to find a justification to see nature in the form of a logical system. The concepts of genus and class were the direct result of a mapping of Aristotle's hierarchical scheme onto natural phenomena. In Kant's estimation, however, no compelling reason, no "transcendental deduction" about nature, had been offered to suggest their actual presence. Such justification had been offered to support the synthetic concepts in *The Critique of Pure Reason*. Unless we suppose that the separate components of nature are governed by rules of connection associating the principles of substance, causation, and reciprocity, we cannot speak of a "nature" at all. The supposition of lawful connection is a necessary requirement for its perception.⁵⁷⁰

The problem, however, is that such a supposition does not mandate a universe in which objects or organisms must share some degree of affinity, thereby enabling their classification into larger groupings such as genus and species. One can still speak of a coherent nature, a cosmos governed by universal law, but in other respects disclosing an "irreducible diversity in the manifold of its appearances" in which "it would be no longer possible to connect particular beings . . . as an ascending order." In such a hypothetical universe each "particular . . . would have to be described simply by itself."⁵⁷¹

Such an extreme formulation, according to Cassirer, was an offence to both experience and common sense, and required the construction of a new synthetic concept which Kant referred to as "the principle of formal

purposiveness." The principle in essence stated that nature, while governed by universal law, also demonstrated "a thoroughgoing organization" in which forms shared similarities of greater or lesser degree.⁵⁷² Kant did not see the principle as a necessary principle underlying the understanding of nature. Rather, it was a principle of the "reflective judgement," a basis for constructing useful heuristics whose validation could only be obtained via interrogation of nature: "Whether or not a perfect classification of natural forms according to class and order, family and genus, is attainable, experience alone can teach us."⁵⁷³

In Cassirer's reading of Kant, the interrogation of nature involves interaction, a feature of his description that particularly interested Innis. If we see a coherence in nature that matches the form of a logical system, it is because we have made the conscious decision to seek it. According to Cassirer:

The search is not something we are compelled to by the objects; it expresses a peculiar command of the reason. For reason addresses itself to nature, "to be taught by her, certainly, but not as a pupil who accepts anything that the teacher chooses to say, but rather as a judge invested with the power to require the witness to answer the questions put to him." Kant used a noteworthy expression for this interpretation when he spoke of an "adaptation" of nature to our understanding or to the rules of our faculty of judgment.⁵⁷⁴

Nature, in Cassirer's reading seemed to meet observer's "halfway" in the course of searches initiated at the behest of formal purposiveness. At this juncture in his argument Cassirer provided a lengthy extract from *The Critique of Judgement*, in part to clarify the meaning of formal purposiveness, and in part to

demonstrate Kant's belief that nature favours specific attempts to map its organisation. For our purposes, the extract is worth examining in full since it provides a frame of departure to suggest Innis' theory of media incorporated a concept much like that of the *attractor*. The schema of cultures in general and individuals in particular are both governed by formal and final cause, and their progression toward one of a finite number of possible end points. Their presence cannot be accounted for by appeal to universal law, or abstract mathematical theory as Innis referred to it. Nor do such systems display a manifold variety of form. There is no need to refer to the concrete theory as Innis referred to it.

Rather such systems must be assumed to have coherence by virtue of the logic of classes. As we shall see, the logic of classes -- or Kant's principle of formal purposiveness -- had an additional implication for Innis, namely that schema change -- the "adaption of nature to our understanding" -- is an emergent property of agent interaction with a communication medium. Such change can only proceed in a finite number of ways, and that process is indeterminate. In essence, our schema fit themselves into an *attractor*. Kant writes:

Any comparison of empirical ideas in order to know empirical laws and accordingly the *specific* forms and, through their comparison with others, the *generically similar* forms in natural objects -- all such comparison presupposes this: that in respect to her empirical laws nature has observed a certain economy that to our judgment appears fitting, and an understandable uniformity, and this presupposition as a principle of a priori judgment must precede all comparison.

The reflective judgment thus proceeds with given appearances, in order to bring them under the

empirical concepts of certain natural things, not schematically but *technically*, not just mechanically, as it were, as an instrument under the direction of the understanding and the senses but *with art*. The judgment orders the appearance according to the universal, though at the same time indeterminate, principle of a purposive arrangement of nature in a system, as if nature were something favorable to our judgment in the conformity of her particular laws . . . to the possibility of experience as a system. Without some such presupposition we cannot hope to find our way in a labyrinth of the multiplicity of separate laws.⁵⁷⁵

Innis' resort to classification and his references to Cassirer, therefore, suggest three elements in Innis' theory of media that we should explore in a survey of his *Idea File* and communication studies. The first is that when agents interact with nature and media in an "artful" fashion, their schema may change. If the change occurs, it will be an emergent property of the interaction. The schema will be governed by the principles of formal and final cause. As such, in any study of culture its prevailing schema are subject to the logic of classes -- justified by the principle of formal purposiveness -- which mandates there are only a finite number of potential schema available for selection by inquiring agents. Stated another way, there are only a finite number of ways that percepts and concepts can reach equilibrium, where nature cooperates and maps itself onto the schema. Finally, it suggests the process of artful interaction is an indeterminate one. There is no way to determine in advance which of the available alternatives will be selected. Given the emphasis on emergence, indeterminacy, and formal cause in Kant's doctrine, the possibility arises that Innis' theories in fact contain a latent

symmetry, one that relates the Oral Tradition with his theory of media. Let us see if these suppositions are reflected in Innis' work.

Innis' writings suggest his theory of media can be distilled down to five propositions, the first being that humans routinely interact with media of communication to form systems with emergent properties. The resulting schema and attending cultural forms are emergent properties of agent-medium interaction.

In 1946 Innis noted in his *Idea File* that:

Patterns in society -- development and background of pattern, i.e. religion or philosophy -- dependence on rate of diffusion, conditions of diffusion, supported by change in methods of communication -- overturn of philosophical and religious patterns or of habits incidental to pattern -- breaking down of monopoly position of ideas and emergence of new systems.⁵⁷⁶

The process of interaction, therefore, with one's contemporaries, and a medium of communication, was a key variable in the dissolution of an old worldview and the onset of a new one. The shift from the old dispensation to the new one, however, was never a smooth one. Periods of stability were punctuated by periods of disequilibrium, engendered by changes in the rate and conditions governing the diffusion of information. Moreover, during periods of cultural emergence, the pace of change was not consistently stable. It was more akin, as we have seen, to a business cycle. In 1946 Innis noted: "significance of catastrophe or technical development -- steady change -- population, technology, etc. all point in the same direction."⁵⁷⁷ In the following year he noted:

Problem of change in velocity of time -- difficulty of those operating at one time or tempo suddenly placed in a new tempo -- probably a factor in the business cycle. Importance of wiping out differences between space and time as both categories of communication.⁵⁷⁸

Innis' references to the movement of a populace and technology "in the same direction," and his references to categories of communication suggest his second proposition, namely that emergent cultural systems eventually become meta-stable, reaching one of three equilibrium points. Innis referred to two of these *attractors* as monopolies of knowledge, one with an emphasis on space, the other towards time. The third equilibrium point was an oligopoly of knowledge, which as we shall see was characterised by a disposition towards space-time.⁵⁷⁹

Toward the end of his life, Innis made clear his debt to Kant and Cassirer for the concept of the monopoly of knowledge. In a 1952 conversation with W.T. Easterbrook Innis indicated his acceptance of Kant's formulation of space and time as categories of understanding.⁵⁸⁰ The debt was further indicated in a 1951 article, in which Innis used Kant's formulation that agents interact with nature in an artful manner to explain the emergence of a bias of time in the 18th century:

In the eighteenth and nineteenth centuries it was possible to develop an architectonic structure to which society could slowly adapt itself, in which nature copied art. The element of time was assumed in the pattern laid down by Adam Smith and the classical economists. Rules were laid down under which society would cooperate.⁵⁸¹

Kant's influence is finally suggested in a 1947 entry into the *Idea File* where Innis noted that: "History does nothing else but repeat itself with dominance of type of thought. Monopoly control over thought and over media implies that nature copies art as nature seen through stigmatic spectacles." ⁵⁸² This last entry bears comment. Innis' entry suggests he did not see a monopoly in this case as referring to a coercive institution that sets the bounds of what its adherents may or may not believe. Rather as Franco Ferrarotti notes, Innis conceived the monopoly as a "theoretico-conceptual apparatus which, like an invisible but determining scaffolding, makes the link with the reality of the world," and in so doing applies an "inevitable criteria of selection" to differentiate phenomena deserving attention from objects and patterns that do not.⁵⁸³ Given Innis' reliance on Cassirer and Kant, his various entries and comments suggest he saw the monopoly of knowledge as something akin to what contemporaries today would label a cognitive *attractor*, the outcome of an agent's interaction with nature in a form similar to art.

It also suggests that the bias of a medium results ultimately not from its physical properties, but from the monopoly or equilibrium that emerges by virtue of the interaction between a medium, and the constraint in information circulation it implies, and an agent, and the exercise in free will the agent concept implies. Innis' third proposition was that the outcome of such interactions is indeterminate. There is no way to tell in advance which attractors or monopoly the agent-medium system will ultimately select. This proposition is first suggested by a 1950 entry into the *Idea File*, in which the construct of cultural change is similar

in form to the dynamics of economic systems governed by increasing returns. Change is propelled by historic circumstance, not the internal properties of the system's constituents.

Evolution probably result of sudden development of favourable conditions in early stage and very difficult at later stages when it becomes crystallized i.e. in case of man and change difficult to introduce other than by force. With increasing power of time possibility of sudden rapid adjustment of earlier periods disappeared -- resources of world less abundant and available.⁵⁸⁴

Here we see reference to a process where the range of action is wide at the start, suggesting the possibility of multiple outcomes, but then becomes progressively constrained by virtue of contingent circumstance, the "sudden development of favourable conditions." The process of crystallisation in Innis' estimation culminated in the formation of monopolies, a period when "the resources of the world," both materially and conceptually, became "less abundant and available."

Innis' third proposition is not only suggested by his allusions to the economics of increasing returns, but also by his identification of the monopoly of knowledge with two other concepts, the business cycle, and market equilibrium. Innis made these links most clearly in his essay "A Plea for Time", in a narrative describing the collapse of monopolies of time in the early 20th century, and the subsequent rise of the state as a new monopoly of space. Recall that in *Political Economy in the Modern State* Innis identified the practice of commerce with systemic change. While Innis believed commercial activity had provided the 19th

century with needed stability, he also acknowledged an unintended consequence of the economics of increasing-returns, the emergence of trusts, monopolies sufficient in size to organise the market, and sufficient in magnitude to rival the power of the state.⁵⁸⁵

In "A Plea for Time" Innis argued that the emergence of trusts invited the intervention of the state. The justification for the "weakening and destruction of monopolies over time" was Newtonian, insofar as the system's survival was seen as being dependent on each part maintaining its prescribed role within the system. In the U.S. particularly the need to maintain a balance of power led to an "emphasis on equilibrium," an emphasis on checks and balances reminiscent of the economics of diminishing-returns. The competition between trusts and state also led to appeals to Darwinian evolution. The relationship between the two organizations was seen as inherently competitive, and only the fittest would survive.

Innis' stance towards monopolies, by contrast, was relatively more sympathetic. Given their object to control markets, he argued that monopolies in principle could do no more than charge a reasonable price for their products. "A grasping price policy," he argued, would hinder future possibilities for growth. Nor did Innis see the monopolists' control of supply as the result of malicious intent. Instead, it was the result of the natural progression of the business cycle: "Little is known of the extent to which large corporations have blocked out the utilization of future resources other than in matters of general policy."⁵⁸⁶

Monopolies in his estimation enjoyed the results of increasing-returns due to favourable conditions in early stages that ultimately led to the crystallisation of the market in a way that favoured them. But such points of equilibrium, as is the case with any *attractor*, were only meta-stable. They are susceptible to dissolution due to heightened disequilibrium, and in Innis' account it was for this reason that the trusts ultimately fell. It was not due to state intervention, nor even World War I. The trusts ultimately fell because of the Great Depression:

Organization of markets and exchanges facilitates the determination of predictions and the working-out of calculations which in turn have their effect on immediate production as an attempt to provide continuity and stability, but limitations progressively increased as evident in business cycles and their destruction of time rigidities. The monopoly of equilibrium was ultimately destroyed in the great depression and gave way to the beginnings of the monopoly of a centralised state. The disappearance of time monopolies facilitated the rapid extension of control by the state and the development of new religions evident in fascism, communism, and our way of life.⁵⁸⁷

Monopolies of thought, therefore can be linked with processes akin to business cycles, whose early trajectories are influenced by contingent historical circumstance, and the positive feedback mechanism of increasing-returns. The mechanism eventually brings the cycle to a point of equilibrium, where the system crystallizes and forms a time rigidity or time monopoly. The process, however, is indeterminate. Contingent circumstance ultimately determines which monopoly the agent-medium system will ultimately select. Once a dominant type of thought is selected, however, the monopoly exercises a regulatory power over

the agent and the medium: "Monopoly control over thought and over media implies that nature copies art as nature seen through stigmatic spectacles."⁵⁸⁸ Time rigidifies, so to speak, leaving culture with a bias towards space or a bias towards time.

For Innis, the importance of this theory of media was that it rested on a conception of change that offered room for human agency. It did so by positing a theory in which change was indeterminate. There was no predicting which bias an agent-medium system would select. It did so by offering the prospect of choice. While human schema had to conform to constraints imposed by a limited number of biases, the prospect of choice remained as one could dissent from one formulation and visit another. It did so by appealing to Idealism. Contrary to the version of final cause identified with the *attractor*, Innis located his monopolies outside of time, and outside the influence of efficient cause. Finally, it did so by offering variety. While bias constrains, it also enables. The bias of time, for example, enabled the expression of viewpoints as diverse as the Greek concept of the *logos*, and Adam Smith's *The Wealth of Nations*.

Innis reinforced these points by identifying his theory of media with Kant's writings on the indeterminate nature of schema change, a point that can be demonstrated first by reference to a 1946 entry into the *Idea File*, and second by another reading from "A Plea for Time". In an entry again indicating the influence of Cassirer's *The Problem of Knowledge*, Innis made reference to the constraining role of media. His reference to Plato, however, also provides a basis to suggest Innis saw such constraints operating within the framework of final

cause, a framework in which he believed human agency was still very much in play. Innis noted:

Monopoly problem of knowledge -- to an important extent based on mediums of communication -- . . . changes in media of enormous significance to civilization as having profound implications to religion, learning, and intellectual capacity and training. Plato's Idea in a sense expressed in monopoly of knowledge ⁵⁸⁹

In "A Plea for Time" Plato's Idea is identified with Kant: "The form of mind from Plato to Kant." The significance of this juxtaposition is that Innis saw it as a schema of change that compared favourably with the mechanistic schemes of change then circulating in the social sciences. Noting Wyndham Lewis's plaint that "the fashionable mind is the time-denying mind," Innis also decried the contemporary fixation with universal law. William James was correct to condemn the denigration of knowledge that was concrete and individual.⁵⁹⁰ Innis' definition of "concrete and individual" here referred to phenomena governed by formal and final cause, a reading indicated by what he wrote next. By virtue of their over valuation of universal principles, contemporary philosophers proclaimed the form of mind "from Plato to Kant which hallowed existence beyond change" as decadent. The reason for scholarly resistance to the concept of final cause, according to Innis, was its suggestion that social and cultural development was ultimately beyond institutional control. Freedom, in this view, lay within the realm of efficient cause. In Innis' mind, however, the

social sciences' fixation on mechanical forms of change led to the opposite conclusion:

This contemporary attitude leads to the discouragement of all exercise of the will or the belief in individual power. This sense of power and the instinct for freedom have proved too costly and been replaced by the sham independence of democracy. The political realization of democracy invariably encourages the hypnotist. The behaviourist and the psychological tester have their way. In the words of one of them: "Great will be our good fortune if the lesson in human engineering which the war has taught us is carried over, directly and effectively, into our civil institutions and activities." (C.S. Yoakum)⁵⁹¹

For Innis, doctrines of social and conceptual change based on efficient cause suggested the elimination of human agency. Freedom, as he understood it, demanded interaction with one's peers, and one's environment, including the communication environment. By virtue of that interaction, worldviews changed, as the agent's interaction with a new communication technology led to the selection of a new bias, either towards space, or time. Human agency retained a role because the dynamic demanded interaction between agent and medium, and because the outcome of that interaction was indeterminate.

The problem with Innis' dynamic of change, however, was that it posited a stark conclusion, namely that interaction with communication media brought with it the danger of cognitive rigidity. Due to the governance of final cause, cultures interacting with a single medium of communication could count on being locked into a trajectory towards a bias towards space or time. And in so doing, such

cultures could count on losing their cognitive flexibility. Their perception of the environment would become skewed. Their constituent agents would lose the ability to adapt. It was a bleak picture, since in Innis' historical narrative such a cognitive state generally presaged a culture's collapse through conquest.

It was not, however, the only picture. Innis in the final tenet of his theory of media argued that a small minority of cultures had historically managed to reach a semi-stable state in which they retained their ability to adapt and to conceive anew. Such cultures were characterised as oligopolies of knowledge, with competing media, and competing constituent institutions. In "A Plea for Time" Innis noted:

I have attempted to show elsewhere that in Western civilization a stable society is dependent on an appreciation of a proper balance between the concepts of space and time. . . . The character of the medium of communication tends to create a bias in civilization favourable to an overemphasis on the time concept or on the space concept and only at rare intervals are the biases offset by the influence of another medium and stability achieved.⁵⁹²

The stability was achieved by maintaining the proper balance between freedom and order at two levels of organisation. At the institutional level, the "quantitative pressure" of knowledge had to be kept in check to enable the emergence and persistence of individual monopolies of knowledge.⁵⁹³ At the societal level, the requisite balance had to be maintained to enable subsequent interaction between institutions with a bias towards space and a bias towards time. In Innis' view, the outcome of such interactions had typically been collapse, as

competing institutions proved unable to harmonise their respective worldviews and power interests. In rare instances, however, the outcome had been self-organisation, the selection by a now unified culture of a third attractor -- or equilibrium point -- characterised as space/time.

Innis said almost nothing about oligopolies of knowledge, aside from mentioning their existence. But his belief in an equilibrium point with a bias toward space/time can be deduced from his writings. Innis subscribed to a dynamic of schema change based upon agent interaction, and a dynamic of schema change analogous to the economics of increasing returns. Consequently, when schema emerged, they could only do so in a finite number of ways. It was well known in economics that systems governed by increasing returns could lead to markets dominated either by monopolies or oligopolies.⁵⁹⁴

Innis believed similar strictures governed the emergence of new schema. His belief in an equilibrium point characterised by an oligopoly of knowledge is indicated first by his description of institution-institution interaction, namely the bias of the existing monopoly is "offset by the influence of another medium and stability is achieved." His belief that such stability constituted an equilibrium point is further suggested by writings that human schema can only fit into a finite number of configurations, based on the principle of formal purposiveness. It is also suggested by Innis' treatment of ancient Greece, in which cultural forms were produced that cohered neither with the strictures of the bias of space nor that of time.

As we saw in our review of Innis' narrative, Greece during its Golden Age produced artifacts that were space-time products. Pythagoras produced a methodology for modelling systems based upon the principle of number, correspondence and succession. In theology, the temporal doctrines of *dike* and *logos* were harmonised with the static conceptions of the Olympian cult, while in art an aesthetic uniting space and time governed Athenian art. Greek science studied complexity. Innis' position regarding the status of the oligopoly of knowledge was aptly summarised by the first line of his essay "The Problem of Space": "Space and Time, and also their space-time product, fall into their places as mere mental frameworks of our own constitution'."⁵⁹⁵

Innis provided, therefore, a philosophy of history that was deeply idealist as opposed to materialist in its orientation. This insight raises the opportunity to address some of the other questions raised at the start of this chapter, including why Innis provided a historical narrative that differed so markedly from his apparent formulations on the historic effects of media. For Innis, media could be defined as anything that constrained the flow of information. There were material and non-material forms of media.⁵⁹⁶ Its importance ultimately rested not on its physical properties, but on its ability to control the "rate of diffusion" and "conditions of diffusion" of information, the variable of greatest interest to Innis.⁵⁹⁷ As long as the quantity of circulating information remained within the required mean, new schema could emerge.

But there was no way to determine in advance the bias that would emerge from agent-medium interaction. In Babylon, competing institutions created

monopolies devoted to space and time using clay and stone, a development that a cursory reading of Innis suggests should not happen. Both media were durable and both suggested a disposition toward time.⁵⁹⁸ For Innis there was no way to determine in advance which bias the agent-medium system would select. In different circumstances, systems could gravitate towards a bias of space, time, or space-time.

The indeterminate outcome of agent-medium interactions in turn suggests that Innis was not a technological determinist but rather a technological realist. Innis was not unmindful of the fact that individual cognitive organisation is affected by use of technology, and interaction with the surrounding environment. But he was equally mindful through his promotion of the Oral Tradition and his writings on media that the problem of bias was one that could be perceived and corrected. There was room for human agency in Innis' worldview. In turn, Innis believed the shortcomings of society were equally susceptible to perception and correction. His historical research prevented him from being a blind optimist regarding the potential impact of communication technology. But his interpretation of cultural change also suggested that despite the constraints imposed by use of technology, there was room for hope. Innis was not a pessimist.

Innis' insistence on the indeterminate nature of cultural change and the continued importance of human agency, however, raises a problem. How is one to interpret passages in the two communication studies that suggest that a medium's physical properties can be correlated with a culture's resulting bias?

Innis' identification of his theory of media with the schema of change associated with the business cycle suggests an answer. Namely, a fifth proposition for the theory of media in which the outcome of agent-medium interaction is governed by a statistical rather than mechanical form of change. This suggestion is first indicated by the qualified language employed by Innis in his communication studies and the *Idea File*. The term "bias" itself suggests a tendency, and as we have seen Innis regarded the formulation of a monopoly of knowledge as being "to an important extent based on mediums of communication."⁵⁹⁹

It is also indicated by Innis' interest from the mid-1940s until his death in 1952 in the study of business cycles using time series. As we saw in the previous chapter, time series refer to phenomena governed by local as opposed to universal constraints. The nature of these constraints suggest the phenomena in turn are governed by a statistical rather than a mechanical conception of change, and in turn that predictions have to be couched in terms of probability. In "A Plea for Time" the problem of prediction was very much on Innis' mind, as he voiced his concern that business and government policymakers were regularly calling upon the social scientist to compile statistics and then "discover patterns or trends which will enable him to predict the future."⁶⁰⁰

The problem, Innis complained, was that the social sciences did not possess the necessary analytical tools to provide useful predictions regarding the future trajectory of the business cycle. True, mathematical formulae were devised, but their utility was suspect for Innis, and at best of use only in the short-term. The social sciences in Innis' estimation were becoming little more than

schools of journalism, and suffered from the general malaise plaguing the west, namely neglect of time: "The difficulty of handling the concept of time in economic theory and of developing a reconciliation between the static and dynamic approaches is a reflection of the neglect of the time factor in Western civilization." ⁶⁰¹

To address this problem, Innis proposed to use the same method employed by Pythagoras to reconcile the static and dynamic approaches to change, namely the construction of models based on time series. The reconciliation would also be facilitated by appeal to a probabilistic conception of change. There are three reasons to suggest Innis mapped the latter conception of change onto his theory of media. First, in a period prior to and contemporaneous with the time Innis spent composing his communication lectures and essays, he was in communication with B.S. Kierstead during the preparation and publication of his *Theory of Economic Change*. While Innis does not cite Kierstead in either communication study, reference to the work establishes Innis' exposure to a theoretical study of business cycles appealing to a statistical conception of change in the mid-1940s. ⁶⁰²

Kierstead's purpose in his study was to explain the behaviour of firms and economic systems during the course of the business cycle. Fundamental to that purpose, he argued, was the derivation of analytic functions reflecting a probabilistic conception of time. ⁶⁰³ Kierstead emphasised the necessity of an appeal to probability theory since any description of social change could not avoid the question of human purpose. While agents, institutions and markets were constrained in their behaviour by the environment, their future trajectory was not

"completely determined by the physical cause, but would be partly influenced . . . by human motives responding to the causal physical event." ⁶⁰⁴ Such motives were governed by the prevailing values or *mores* governing a culture. ⁶⁰⁵ If an economist had access to these values, Kierstead believed, a simplified model regarding the future behaviour of a social aggregate could be constructed, and its future inferred on a basis of probability. While such predictions would never be determinate, the field of economics could "claim for them a high degree of probability within the conditions defined by the simplifying assumptions." ⁶⁰⁶

Kierstead proposed to translate these insights into a set of functions that would describe the future behaviour of firms during the business cycle. The problem with the existing analytical tools in economics, he argued, was that they rested on the premise that the observed system was in stasis. Market relations governing a firm's cost and subsequent revenues, such as public taste, population size, and capital supply were seen as operating "out of time." With all factors fixed, it was possible for any given product to derive one function governing the firm's unit cost, and a second governing its revenue. These functions also operated outside of time.

The two functions could then be traced on a graph, and the firm's equilibrium point determined by examining where the two lines intersected. A firm's future behaviour could be predicted following this method since the output prescribed by the equilibrium point was the one production level where a firm could recoup its costs while remaining competitive with peers in a system of

perfect competition. Similar principles could be applied to predict the future behaviour of the economy at large.

Or so it was thought. For Kierstead the method of "comparative statics" -- the determination of a firm's or system's potential equilibrium point at any single instance *in time* -- had little predictive value regarding the future behaviour of firms, since they progressed toward their equilibrium points in systems with market relations that changed *over time*. Supply and demand levels changed, thereby altering the conditions of equilibrium. In Kierstead's opinion, the method of "comparative statics" at best offered a means to predict the short-term behaviour of economic systems, a concern that was shared by Innis.⁶⁰⁷

For tools that were useful over the long-term, however, what was required was not only a new set of functions, but a new conception of change from which to derive those functions. Mechanistic forms of change assumed laws that remained fixed over time. In Kierstead's estimation, market relations evolved over time. And if the market was to be seen as having any coherence at all, it would have to be approached from a probabilistic conception of time. While the specific price and output functions Kierstead proposed are not important for the purposes of this study, the method he proposed for their confirmation is significant, since it against suggests Innis' exposure to economic theory relating a probabilistic conception of change to the study of time series.

These price and output and output functions in time are, or ought to be, capable of measurement, and can be expressed, of course, as functions of one another. I have hoped that statistical inquiry, based on time series, might be able to create mensurable

price and cost functions that would correspond to the analytical functions derived here.⁶⁰⁸

A second basis for suggesting Innis mapped the theory of probability onto his theory of media lies in the correspondence between himself and Arthur Cole in 1950. In their exchange the two briefly discussed collaborating on a project devoted to the study of "time horizons" of long-lasting firms such as the Hudson's Bay Company. The supposition of both was that successful firms lasted because they retained a schema of time that translated into adaptive behaviour. In the context of these discussions, Innis explicitly raised the possibility that businesses might see greater predictive value in probability theory for predicting future market trends than methods suggested by current economic theory. It was also in the context of these discussions that Innis mentioned Kierstead's work to Cole, suggesting it and other works "offered the prospect of common ground between theorists and historians" in the field of economics.⁶⁰⁹ Hence, at a point when Innis had composed the majority of his communication writings, there is evidence that he saw probability theory as the most promising basis for establishing generalisations and making predictions about the business cycle.

The discussion was precipitated in part by Innis' confession in January of his concern "to the point of obsession" with the neglect of time in the social sciences. The field of economics in particular suffered from its overemphasis on "hedonistic principles" and its corresponding neglect of cultural factors. For Innis, as with Keirstead, a concern with culture implied "an interest in continuity or in the time factor."⁶¹⁰ Such concerns would find a more pronounced

expression the same year in "A Plea for Time," which Innis first introduced in the form of a lecture at the University of New Brunswick. It also provides a basis to suggest Innis had the role of human volition and probabilistic change very much in mind when he wrote to Cole. In "A Plea for Time" Innis noted:

The need for a sane and balanced approach to the problem of time in the control of monopolies, and in the whole field of interest theory and in other directions, is evident in the growth of a bureaucracy in a totalitarian state. The static approach to economic theory has been of limited assistance in meeting the problem of time.⁶¹¹

Innis' intent here is suggested by entries he made into the *Idea File* regarding interest theory. On one level Innis, again like Keirstead, associated the progression of the business cycle with individual volition, noting: "INTEREST RATES -- Business fluctuations result of increase or decrease of intensity in belief of possibility of predicting the future -- influence of communication."⁶¹² Innis also identified interest theory with a probabilistic conception of change in a 1951 entry into the *Idea File*: "Problem of time in whole problem of interest theory -- development of probability -- insurance, etc. -- i.e. conflict of pecuniary interest in time and industrial interest in place."⁶¹³

In February of 1950 Innis again referred to the themes of volition and probability as he and Cole began discussion of the Time Horizons project in earnest. Ambitious in scope, the purpose of the project was to study the time perspectives of two or three "economically variant companies" as the various levels of their operation, with the concept of time begin defined as "a measure of

proper planning", a "directive of thought," and "a measure of action." Such measures were to be applied to assess the behaviour of firms from disparate sectors in areas such as acquisition of raw materials, product planning, and maintenance of inventory. Innis' reference to the project in the *Idea File* also contains reference to: "statistical studies over forward orders of machine builders -- or inventories or stand-by equipment."⁶¹⁴

While Innis' entry does not explicitly state whether participants of the project were themselves supposed to undertake the statistical studies, or merely to assess the studies undertaken by the subjects of the study, his correspondence with Cole suggests the latter interpretation. Complimenting Cole on "the general hypothesis" for the project "which you have worked out and which really seems exciting" Innis queried Cole "whether it would be possible to obtain from American industries some idea as to how much money they feel should be devoted to forecasting."⁶¹⁵

Innis further elaborated his interest in forecasting in a February 28 letter to Cole in which he stated his belief that the private sector had "faced and dealt intelligently with the continuity or time problem" in contrast to governments, which he characterised as belonging to "that segment of society which has never considered the problem of continuity and has been essentially transient." For Innis, a central concern for the project would be to determine the duration of predictions companies made based on statistics, noting "it would be interesting to know how far insurance companies feel they can go in using mathematics to forecast the future." Government, in Innis' estimation, retained an unhealthy

monopoly in the field of prediction, basing their predictions upon the faulty assumptions inherent in comparative statics. And it would remain the primary forecaster of market behaviour until its methods and practices were challenged by the private sector.⁶¹⁶ The two concluded their correspondence on the topic in April, with Innis maintaining his belief in the project's "importance and difficulty."⁶¹⁷

Given Innis' identification of the formation of monopolies with the business cycle, his exposure to theoretical work emphasising statistical change, and his appeal to probability theory in the proposed study of firm time-horizons, is there any material in the communication studies which, read in light of the preceding material, would suggest Innis mapped a statistical conception of change to his theory of media? The answer is yes. The third reason to suggest such a mapping lies in the regime of change that Innis identifies with the classification sciences and social change.

To start, Innis' reference to Aristotelian biology, which we have already seen, suggests an interest in more than the logic of classes and final cause. He was also interested in formulations describing phenomena embodying purpose, and standing "half-way between the immediate concreteness of the individual theory and the complete abstractness of mathematical notions."⁶¹⁸ Innis' interest mirrored Kierstead's in the socio-physical event in which "there is no *necessity* in individual behaviour, . . . it is only if you have a sufficient number of individuals that you can assert the group . . . [behaves] in a specific way, "that is in a probabilistic way."⁶¹⁹

Innis' stance is also indicated in the relationship he draws between constraint and social change in the introduction to *Empire and Communication*. As we have seen, Innis reduced his theory of media to any factor -- material or non-material -- that governed the efficient circulation of information. Given that, it is telling that Innis, after describing a series of generalisations regarding the cultural effects of writing, should offer the following qualification:

The generalisations which we have just noted must be modified in relation to particular empires Such generalisations as to the significance of writing tend to hamper more precise study and to obscure the differences between civilizations dependent on various media of communication. We shall attempt to suggest the roles of different media with reference to civilizations and to contrast the civilizations.⁶²⁰

Within Innis' framework of cultural change, therefore, the most one can do is to suggest a tendency, in part because human agency retains such an important place in Innis' thought. And overall, that is precisely what Innis did when making his generalisations about media. In a culture or institution using a communication medium of lightweight material, one might expect the resulting circulation of information to facilitate an interest in space. It was a probability, but a correlation between an institution with a bias towards space and a light medium such as papyrus was never guaranteed. In ancient Israel the state used stone, its religious critics papyrus. Cultures could even change their orientation while using the same physical medium as Greece did, shifting from space to time, then maintaining a brief balance between space and time, before shifting once more to

space, all the while using papyrus. In sum, Innis did not posit a fixed relationship between a specific medium and a particular bias. The basis for that contention, however, rested on more than his empirical observation of the past. It also rested on the economic theory he brought to bear to inform his reading of the past.

V

With his appeals to emergent change, and formal and final cause, Innis brought to bear a symmetry in his communication writings, one that linked his theory of the Oral Tradition with his theory of Media. The appeal to probability theory, however, suggests that another unity linked all his writings on communication, namely a belief that human agency had remained an important constituent of change throughout the history of the West. As long as the control parameter of information had remained at a manageable level, participating agents had retained the capacity to conceive mechanic and systemic models of time, apply them, and balance them as needs required.

Historically, it was only when empires were flooded with cultural forms, from within or from without, that Innis saw the possibility of agency as problematic. In the present and in the past cultures immersed in the Written Tradition had generally forsaken wisdom for passion and insight for doctrinaire approaches to the world. In Innis' schema, when agents at all levels of society

ceased interacting, it was a sign that participants had abdicated their freedom, cognitively and politically.

Individuals and societies that retained a desire for freedom, by contrast, embraced methods of communication consistent with the Oral Tradition. In Innis' narrative they were distinguished by a readiness to challenge accepted verities, and use of communication systems that facilitated construction of new models. The Greeks used the alphabet and were able to construct abstractions from geometry. The Egyptians by virtue of their use of hieroglyphs were not. For Innis, freedom was built upon a communication system that facilitated the development of formal complexity.

Finally, freedom was based upon a culture's recognition of the role systemic change played in the evolution of culture. Monopolies of thought continually emerged due to agent interaction with media, and the presence of formal and final cause in human history. Agents were susceptible to lock-in, but they were also characterised by the potential for self-awareness. New media could be embraced and new monopolies of thought devised to counter the shortcomings of existing orthodoxy.

For Innis, then, it was key that agents realise their need to challenge and shape the things to which they attend. As long as they did so, it was perfectly possible for them to reach conclusions separate from the prevailing orthodoxy suggested by a particular medium of communication, and to impose a new bias on a new medium. While a medium's physical properties played a role in the ultimate outcome of a culture's orientation towards time or space, it was not the

only factor propelling cultural change. Human agency retained an important role in Innis' historical framework, and the ultimate outcome of interaction between an agent and a medium was never certain.

Conclusion:

Harold Innis' career can be characterised as the practice of philosophy by other means. In his studies of Canada's economic history and the history of communication technology, Innis' intent was to explore the nature of social and economic change. And throughout his career, Innis consistently applied a schema of change that is today associated with *complex adaptive systems*. It is this framework that unites his earlier and his later work.

As we have seen, Innis described systems in which economic, political, social and cognitive structures are emergent properties. They were the by-product of interactions between numerous agents. For such emergence to occur, Innis repeatedly emphasised that agents -- be they in the form of members of the public, or economic and cultural institutions -- had to operate in an environment in which there was a balance between liberty and constraint.

In contemporary terms, such systems had to be operating at the "edge of chaos", a state that could only be obtained through appropriate control of the system's control parameter. As we saw with Stuart Kauffman's genetic switches, for example, the number of connections between genes determined whether the network remained in stasis, turbulence, or demonstrated emergent behaviour. Innis argued the same point, identifying transportation and then communication as the key variables of the economic and communication systems he studied. When these variables allowed for the right balance either in control of transport facilities or quantity of circulating information, self-organisation occurred.

Innis also argued that the systems he studied demonstrated differential persistence. Once a system emerges in an environment, it has staying power. It is often incorporated into a larger system as a component, its function determined by the context in which it is embedded. In biological systems, John Holland has identified a three-bone configuration that has found use in contexts as diverse as a fish's gill and a reptile's jaw. Systems displaying differential persistence are also not dependent on the components comprising them for their continued existence. An autocatalytic set, for example, may replace all the components that initially comprised it, and still retain its formal integrity. A standing wave in a stream is not dependent on specific water molecules for its existence. Innis pointed to a similar phenomenon in his studies of change, particularly in his economic histories.

Finally, this study has suggested that Innis throughout his career demonstrated an interest in systems governed by formal and final cause, another distinguishing feature of *complex adaptive systems*. In systems governed by formal cause, the whole is more than the sum of its parts, meaning that the parts self-organise into a system that then regulates the behaviour of its constituent parts. The price of the constraint, however, is worth it since the capabilities of the system exceed what its agents can do individually.

One fascinating trait of such systems is that they display purposive behaviour, or final cause. As this study has emphasised, the two forms of causation are of a piece. Such systems are not passive recipients of matter and energy from the environment, but rather appropriate resources to maintain their

formal integrity. Even simple systems are aided in this task by schema, models of the environment which enable the system to locate needed resources. Even in simple systems, such schema are susceptible to change as a result of interaction with the environment. Systems learn. They are also governed by a second dimension of final cause, namely emergent systems gravitate toward a fixed state or range of behaviour known as attractors.

As we argued in Chapter Two of this study, Innis came as close as he ever did to explicitly laying out the intellectual agenda that shaped his career in his celebrated defence of Thorstein Veblen: "The Work of Thorstein Veblen". Innis' ambition like Veblen was to provide a description of economic change that mirrored the course of development in biological organisms. It was well known in Innis' time that such growth could not be explained by the principles of efficient cause. Kant explicitly stated the point. Innis would make the same point implicitly in *The Fur Trade*.

In his narrative Innis argued that the characteristics of a region's economic, social and political structures were directly related to the techniques employed by agents to extract resources from the surrounding environment. According to Innis, in Canada and the U.S. these structures had persisted into the 20th century. The structure of Canada's economy differed from the U.S. and Britain because its origins were different. The prominent role of the Dominion government in Canada's economic life, and the high degree of centralised control in Canada's economic and transport industries were characteristics that both could be traced to the founding activities of the fur trade.

Innis' history begins with the encounter of European traders with the First Nations, and the selection by multiple agents -- French and Aboriginal, individual and institutional -- of fur as the commodity to be extracted from the environment for the purpose of trade. From the start, the trade was subjected to periods of heightened disequilibrium which prompted re-organisation. In the 17th century, astute bargaining by aboriginal traders induced Champlain and his colleagues to self-organise into a combination.

Subsequent states of disequilibrium, however, forced the French to modify their schema of monopoly. Due to the onset of war and disease in the 1660s, New France lost its aboriginal suppliers of fur. Subsequent monopolies were forced to send agents in the interior to procure furs, and in so doing, to release control over the terms of trade and transport within North America. Disequilibrium prompted a re-scripting of the fur trade's schema, and a new period of self-organisation.

Innis' descriptions of Canada's economic history also made repeated reference to the role of formal and final cause. In the case of New France, the trade prompted the French government to heighten the centralisation of the colony's religious and agricultural institutions, for the purpose of supporting the fur trade. Canada's specialisation in staples according to Innis resulted from interaction with its trading partners, not the dictates of an Imperial centre. Final cause was revealed in Innis' insistence on the formative role played by the fur trade on Canada's subsequent economic evolution. Individuals such as Donald Smith applied lessons learned from the fur trade in their new roles in the banking, railway and government sectors of Canada's economy. The outcome of that

continuity was differential persistence. The structure of Canada's largest institutions remained highly centralised, with limited degrees of distributed control.

In his studies of the cod fisheries Innis shifted his attention from Canada's national economy to the international economy of the North Atlantic. Tracing the rise and fall of mercantilism in the British, French and Spanish empires, Innis focussed his attention on the Maritimes and New England, the regions in North America most affected by the Atlantic economy. Reiterating his belief that the persistent political, economic and social structures of each North American region could be traced to the initiating stage of European economic activity, Innis argued that the east coast of North America was characterised by institutions in which control was distributed, a development that Innis traced to the fishing industry.

He also constructed a narrative in which the economics of increasing returns played a central role. Increasing returns is the economic term for positive feedback, the process whereby an emergent system begins channelling the activities of its constituents. In economic systems, agents enter into a self-sustaining process where exchange leads to high profits, growth, and heightened opportunities for exchange. A second round of exchange leads to still higher profits and opportunities for growth. Adam Smith referred to this process in his famous dictum -- one with which Innis was well aware -- that exchange gives rise to the division of labour, and the extent of that division is determined by the extent of the market.⁶²¹ Stated another way, economic systems governed by

increasing returns enjoy growth, the continued incorporation of new agents, and a capacity to provide a broader range of services. They become more complex.

As this study has argued, increasing returns had a three-fold importance in Innis' narrative. It explained the emergence of the North Atlantic trading system, Britain's victory over France in its bid for hegemony over North America, and the fundamental economic cause of the American Revolution. His narrative begins in the 16th and 17th centuries, when Britain and France, eager to obtain specie from Spain, extended their fishing interests to the coast of Newfoundland. Due to the relative ease in acquiring capital to procure a ship, the North Atlantic became populated with thousands of agents in a position to conduct international trade. It was English fishermen, however, who seized the opportunity to engage in commerce. England was a trading country. Its geography mandated trade to gain needed supplies. France, by contrast was a geographically diverse country. It enjoyed a relatively self-sufficient economy. English fishermen were also spurred to trade by a small domestic market and the need for salt as a preservative agent. The industry itself was concentrated in the West Country and facilities constructed to sort fish prior to export. The French industry on the other hand was dispersed throughout France, and enjoyed a domestic market sufficient for its needs. In short the English industry, by virtue of its interaction with the home market, was structurally and cognitively predisposed to trade. The French industry was not. Formal and final cause provided England with an advantage as it expanded to Newfoundland.

Aside from providing cargo space, the English industry provided another prerequisite for a trading network: people. Anxious to reduce operating costs, fishermen conveyed settlers to England's North American colonies. According to Innis the presence of multiple agents led to exchange and economic diversification. Agriculture, fishing and shipping industries emerged in New England, staple economies in the southern American colonies and the West Indies. By the middle of the 17th century, a trading network linking New England with the West Indies had emerged, a network that regulated the activities of its constituent parts through increasing returns. In the West Indies, high profits induced planters to specialise in sugar. Formal and final cause also prompted the incorporation of a new constituent -- West Africa -- into the trading system to heighten the system's capabilities according to Innis. Slaves were imported as a source of cheap labour and to produce more sugar. By the 18th century, New England serviced a trading network comparable in size to that of Britain.

As we have seen, Innis also argued that the economics of increasing returns enabled Britain to oust France from North America. Colbert was never able to integrate French colonies into a single trading network. French fishermen, by virtue of their historic interaction with France's domestic market, had created an infrastructure tailored to meet the needs of that market. Formal cause predisposed these agents to remain within the trading system to which they were accustomed. Accordingly, New France was never able to draw on the capacities of its sister colonies to assist it in the fur trade. Instead, New England due to expanding markets incorporated the French West Indies into its trading system,

and used West Indian molasses and rum to bolster its position in the fur trade. According to Innis, British and New England success in usurping French sources of furs forced France to construct a series of military fortifications to contain its rivals. The expense, and dwindling revenues from the trade, destroyed the economic viability of New France. In Innis' narrative, two trading systems competed for resources and the one with superior capabilities won. The conquest in his reading merely aligned the continent's political structures with the underlying economic reality of the time.

British hegemony over North America, however, did not bring economic stability. New England's economic growth continued as it participated in the fur trade and serviced the heightened U.K. presence as well. Its demand for sugar and molasses rose, and therein lay the problem. Planters in the British West Indies, upset at New England's trade with their French competitors, pressed the British parliament to pass legislation restricting New England's commercial ties to British possessions, a measure realised by the *Sugar Act of 1764*. The restrictions initiated a conflict that evaded resolution, as New England needed quantities of sugar that the British West Indies were unable to provide. The conflict combined with other British legislation restricting American activity, precipitated the American Revolution, and the collapse of the First British Empire. Britain's fundamental mistake, according to Innis, was its attempt to contain a commercial economy governed by increasing returns. The mistake, however, precipitated economic and political reform in Britain, culminating in the dismantling of the mercantile system via the Corn Laws of the 1840s. And as we have seen, the

resulting disequilibrium prompted by free trade resulted in political and economic reform -- or self-organisation -- in Nova Scotia, including responsible government, its participation in the Reciprocity Treaty of 1854, and Confederation.

In 1946 Innis shifted his focus from economics to the larger, more multi-dimensional problem of culture. While Innis never explicitly stated his reasons for shifting to the study of communication, we argued the probable causes were intellectual concerns generated by the Depression, and the onset of World War II. Innis believed the West required a jeremiad, one that would speak truth to both power and the populace. Relying on the same systemic worldview that had informed his studies of the fur trade and the cod fisheries, Innis warned that the West was plagued by a structural problem. It failed to recognise that culture was governed by a variant of change characterised by self-organisation, with constraints resulting from the operation of formal and final cause. Cultural growth and adaptation would only ensue if the West was able to control the control parameter which maintained the correct balance between cognitive rigidity and flexibility, namely the quantity of circulating information. Since the 19th century, the mass press had disturbed that balance, leading to the onset of nationalism, the decline of commerce as a stabilising factor in international relations, the collapse of the international system and the onset of two world wars. There had also been a concurrent decline in the quality of popular culture. Unless steps were taken to perfect the information management practices of Europe and North America, Innis warned, the West could expect more of the same.

To avoid that end, Innis proposed a three-fold agenda for the social sciences to facilitate the moral and intellectual regeneration of the West. The first task in his mind in his mind was for the social sciences to adopt the mantle once assumed by the church and then commerce, namely to act as the voice of restraint. Philosophically, Innis believed it was not the mandate of the social sciences to engage in social engineering, but rather to identify the constraints within which human activity operated. The British had failed to recognise the importance of increasing returns economics, and the American Revolution had been the result. Unless the West lost its preoccupation with the present, Innis feared it would make the same mistake.

The second task was to generate new modes of representation that would facilitate public and policymaker recognition of constraint, or pattern in all realms of human activity. Innis feared that members of the reading public were losing the capacity to perceive form. Literature since the 19th century -- in his estimation at any rate -- had lost the aesthetic unity that had tied the disparate parts of the novel together. Dickens' works were little better than journalism. To reverse this trend, Innis appealed to the domains of religion and art for inspiration, appealing to the capacity of both fields to portray complex ideas in visual form.

Finally, Innis appealed to social scientists to adopt a methodology that would enable them to model and characterise emergent systems. Such a method, Innis argued, involved more than examining quantitative data. It meant examining the full gamut of human activity -- including politics, culture and technology -- from the standpoint of space. As we saw through our reading of

Norbert Wiener's writings on time series, Innis also wanted to correlate relationships between series as they existed in time. By following this method, Innis believed scholars would be able to trace the contours of existing economic and social systems, and in so doing overcome *a priori* biases that hindered scholarly inquiry. Economic systems were not constrained by national borders, nor were weather or cultural systems. Scholars should not study them from a national perspective. Another virtue of the method was that it enabled Innis to locate the control parameter that induced periods of cultural and economic disequilibrium prior to self-organisation. By juxtaposing first the history of technology and then communication with the history of economic and cultural systems, Innis believed he had discovered two of the key variables governing cultural change.

In *Empire and Communications* and *The Bias of Communication*, Innis built upon insights gained from *Political Economy in the Modern State*. His primary interest -- as indicated by his references to previous work -- was to demonstrate that the rise and fall of empires had been governed by the process of emergent change, as well as formal and final cause. Innis also proffered two propositions, the first being that circulating information had been the control parameter of empires past and present. This study has argued that it was this variable -- rather than media of communication -- that was Innis' primary concern in his case studies of empire. Innis also argued that the study of prevailing schema in historic cultures could be used to assess their success in managing information. Healthy cultures had competing schema representing mechanical

and systemic constructs of change. Empires such as Egypt, Assyria and Rome, however, failed to find the right balance between constraint and freedom in the flow of information, and eventually embraced a fatalistic -- or mechanical -- construct of change. Cognitive rigidity led to institutional rigidity, and the three empires lost their ability to adapt to changing circumstances. They eventually succumbed to their competitors. Greece, by contrast, managed to find a sustainable balance, in part because of restricted access to papyrus, and in part because of its adherence to the Oral Tradition.

Stated simply, Innis' reference to the Oral Tradition was a statement that creative thought followed the rules of emergent change and formal cause. Relying on Plato Innis argued that new worldviews emerge as a result of social interaction. In Plato's words, a new light kindled in the mind. Based on a reading of Cassirer, Innis argued such a "light" occurred when nature mapped itself onto a model submitted for social approval. It was an emergent property. Innis appealed to formal cause in his description of the Oral Tradition. At base, thought was a formless flux. Individuals were only able to express themselves through the use of language as an instrument of constraint. Human expression of and by itself was an emergent property. In Innis' mind, poetry had the highest appeal as an instrument of constraint because of its formal complexity. In essence, he believed the lays and ballads afforded users more building blocks to generate models of greater precision and sophistication. Poems also functioned as time series, alerting users to the temporal nature of observed systems, and enabling them to discern systems that transcended national borders. Innis finally argued that

constructs composed of lays and ballads functioned much like a *complex adaptive system*. The distributed whole altered the significance of its constituent parts. The point is important, as the Oral Tradition enabled the Greeks to construct models that shifted their worldview from one of myth to one of science.

Finally, this study has argued that Innis' theory of media cannot be characterised as an example of technological determinism. When Innis' narrative is examined closely, it is clear his generalisations regarding the physical properties of media do not stand up, at least if they are viewed from the vantage point of efficient cause. Light media such as paper are supposed to predispose a society towards a bias of space, and yet numerous examples in his narrative suggested they had the opposite effect. This study suggested Innis made room for human agency in his theory of media by linking it with a construct of change based on formal and final cause. Special stress was laid on one dimension of emergent systems governed by final cause, their tendency to gravitate toward one of a finite number of end points or attractors, which this study defined as fixed states or modes of behaviour. Unlike systems governed by efficient cause the future state of an emergent system cannot be predicted in advance. There is no way to predict which attractor the system will select. The process is indeterminate.

This study argued that Innis applied a similar construct of change to his theory of media. The bias of a medium is an emergent property of the interaction between it and agents. There is no way to determine in advance which bias the agent-medium "super-system" will select, although Innis' writings do suggest the

selection is susceptible to the influence of human purpose. Once it is selected, however, the system begins to stabilise, and the culture becomes more and more disposed to view its surroundings from the standpoint of either space or time. Once the system completely stabilises Innis argued it had reached an endpoint, or monopoly of knowledge, in which participants are locked into one bias or the other. At select points in history, a system of systems had emerged, or an oligopoly of knowledge. In such an instance, Innis viewed agents as having a bias of space/time.

To support this reading, this study referred first to Innis' identification of his media studies with the construct of change associated with the business cycle. As his study of *The Cod Fisheries* indicated, Innis understood that economic systems experiencing growth were governed by increasing-returns. He also understood that such systems had multiple potential equilibrium points. There was no way to predict in advance their ultimate trajectory, nor the trajectory of a culture using a new medium of communication. Such a reading was also indicated in our exploration of Innis' work as an example of inventory or classification science. Relying on Ernst Cassirer's reading of Kant's *Critique of Judgement*, Innis argued that objects and phenomena within the domain of the classification sciences were governed by formal and final cause. Such objects -- such as biological forms -- were susceptible to classification because they manifested -- or self-organised -- themselves in a finite number of ways.

For Innis, Kant's insights had appeal because they shed light on the generation of mental schema and provided a basis for classifying them. Schemas

-- at least those organising phenomena governed by formal cause -- emerged because of human interaction with the outside world. In Kant's words, data were brought into conceptual order "not schematically, but *technically*, not just mechanically . . .but *with art*." ⁶²² The process was an indeterminate one. Nature periodically rewarded the efforts of agents seeking to discover order by mapping itself onto models submitted for empirical verification, but there was no predicting what type of mapping would take place.

The resulting schema, however, had to fall within the constraints imposed upon all objects governed by formal cause. In Kant's words, "nature has observed a certain economy" with respect to the generation of animate forms "that to our judgement appears fitting". ⁶²³ With respect to schema, Innis accepted Kant's assertion that nature's economy was governed by distinct categories of understanding. He pointed to three. All human schema self-organised into forms that bore a formal similarity with mechanical change -- and a bias towards space - - formless flux-- and a bias towards time, or systemic change, and a bias towards space-time. These three attractors shaped human thought. In 1947 Innis noted in his *Idea File* that history "does nothing else but repeat itself with dominance of type of thought. Monopoly control over thought and over media implies that nature copies art as nature seen through stigmatic spectacles." ⁶²⁴

Because Innis' writings suggest he saw the emergence of media bias as an indeterminate process, this study concluded by suggesting his generalisations regarding the physical properties of media should be approached from the standpoint of probabilistic change. While the literature has long recognised Innis'

emphasis that his statements about media were qualified generalisations, this study has differed by suggesting that the template of change he applied derived from his study of business cycles during the 1940s. His writings and correspondence during the period in which he was composing the two communication studies suggested an interest in the application of probability theory to predict future market behaviour. As we observed in *Empire and Communications* Innis revealed an interest in a variant of change associated with the classification sciences, one that stood "half-way between the immediate concreteness of the individual theory and the complete abstractions of mathematical notions."⁶²⁵ It was a description consistent with a probabilistic conception of change. Innis' observations about the tendencies of media, therefore, were not only informed by his inspection of the past, but also by the economic theory he employed to inform his analysis of the past.

By way of conclusion, this study has argued that there are substantial benefits to be gained by reading Innis' work using the template of change currently associated with *complex adaptive systems*. This study has argued that while the terminology and articulation of the theory of *complex adaptive systems* is new, the variant of change it describes has been known for a long time. Indeed, both Innis and current researchers in the science of complexity such as W. Brian Arthur, John Holland and Alicia Juarrero have pointed to common intellectual antecedents. The benefit of the current articulation, however, is that it provides a complete and abstract description of *complex adaptive systems*, and a useful frame

of reference for interpreting Innis' writings, which rarely went beyond providing concrete descriptions of the systems under study. As this study has attempted to demonstrate, there is a coherence to Harold Innis' work, a theoretical framework which unites his earlier work on staples with his later work on communications. Our reading suggests Harold Innis knew a great deal about systems displaying emergent properties, and about the concepts of formal and final cause.

The study also suggests that more research needs to be done both to interpret Innis' work and to appraise his significance as a scholar both nationally and internationally. Certainly, a comparative study of Innis' work on communication and Norbert Wiener's writings on cybernetics should be undertaken. Contemporaries of both scholars cited commonalities in the writings of the two. And as we suggested in Chapter Four, both scholars characterised human societies as self-regulating self-organising systems. Both were also interested in systems in which information was the control parameter.

Further, as Judith Stamps has suggested, Innis' writings would benefit from a sustained comparison with the writing of communication theorists from Europe. The appeal of such interdisciplinary readings is that potentially they can clarify our understanding of Innis, and reveal topics that are either latent or missing in Innis' own discussions of communication.⁶²⁶ One promising candidate for such a study would be Mikhail Bakhtin, the famed Soviet literary critic whose writings provoked intense interest in western Europe and North America when they were first translated in the 1960s. They remain a fixture in the field of literary criticism in this first decade of the 21st century. The critic Gary

Saul Morson, for example, has noted that: "In our time, the greatest critic concerned with examining literary works [as a form of philosophical thought] is, in my view, Bakhtin."⁶²⁷

There are two reasons why Bakhtin invites comparison with Innis. His study of Dostoevsky's poetics, first published in 1929, and re-issued in 1963, provided a sustained analysis of the role of dialogue in literature, and would provide Innis scholars with a promising counterpoint to Innis' own writings on the Oral Tradition. Bakhtin is also an appealing subject for comparison because of his interest in the *chronotope*, a concept he coined to describe historic constructs of space and time as they appeared in the ancient, medieval and modern novels.⁶²⁸ The significance of Bakhtin is that he like Innis relied on the writings of Ernst Cassirer to inform his conceptions of time and social change, especially in his two mature works, *Rabelais and His World* and his essay "Forms of Time and of the Chronotope in the Novel". Both works reveal a preoccupation with systems with emergent properties that are governed by formal and final cause, and consequently both invite comparison with *Empire and Communications* and the *Bias of Communication*.

Finally, while this study has endeavoured to demonstrate Innis' adherence to an ecological construct of change, it has not addressed the question of power in his writings. As Donald Davis has observed, histories that rely on systemic forms of change generally avoid questions of conflict. Indeed, such constructs are seen as antithetical to the very idea of conflict.⁶²⁹ But Innis did not agree with this view. His writings on *Political Economy in the Modern State* specifically address

the problem of power, while his communication studies attempt to make conflict a mechanism for emergence, via competition between institutions with a bias either towards space or time.⁶³⁰ John Holland notes that *complex adaptive systems* do allow for conflict between constituents, while Ian Parker notes that not all systemic relationships are benign. Some are parasitic. Others are competitive.⁶³¹ Scholars in the Innis literature have generally accepted that Innis successfully incorporated the problem of power into his writing. More work needs to be done, however, to see how well he reconciled, or if he reconciled, his systemic view of economic and cultural change with the problem of social conflict that also pervades his writings.⁶³²

As this brief review indicates, there is still much work to be done in appraising the international significance of Harold Innis' work. One theme that is likely to emerge, however, is his contribution to the 20th century's growing preoccupation with emergent change.

Endnotes:

Introduction:

¹ For personal portraits of Innis, see Anne Innis Dagg, "Memories of My Father," in *Queen's Quarterly*, 101 (1): 79-91, Spring 1994; and Tom Cooper, "The Unknown Innis," in *Journal of Canadian Studies*, 12 (Winter 1977): 111-118.

² Marshall McLuhan, "The Later Innis," in *Queen's Quarterly*, 60 (Autumn 1953): 389. Robert Babe notes: "Innis is not an easy read. Donald Creighton described the style as 'difficult, highly condensed, extremely elliptical, and not infrequently obscure.' Northrop Frye found it 'impenetrable,' at least upon first perusal. . . . His later works on communication are, if anything, less coherent still. Reviewing *The Bias of Communication* (1951), E.R. Adair berated the author for his 'intellectual shorthand,' complaining that the celebrated political economist 'rarely troubles to put in the words, let alone the phrases, that would show what connection there was in his mind between a sentence and the ones that precede and follow it.' Indeed, Innis' infamous 'History of Communications' awaits publication to this day despite a long line of editorial efforts on the part of luminaries such as Mary Quayle Innis, Northrop Frye, Ian Parker, and William Buxton." See Robert Babe, *Canadian Communication Thought: Ten Foundational Writers*, (Toronto: University of Toronto Press, 2000): 52.

³ "Review: *Political Economy in the Modern State*," in *The Economist*, February 8, 1947, p. 239.

⁴ Jack Granatstein and Norman Hillmer, "Canadians Who Inspired the World," in *Maclean's*, September 4, 2000, p. 29; In a 1998 survey of the 100 Canadians who inspired the nation during the 20th century, however, Granatstein and a panel ranked Innis the country's third most important intellectual. He noted of Innis that he "was no humorist, and his prose style still makes students shudder. But Innis studied the staple industries -- fur, fish, timber and wheat -- that had been the mainspring of Canadian development, and his argument that Canada developed because of Geography, not because of it, took hold. Examination of the routes followed by trade led him to study the theory of communication, and his ideas piqued Marshall McLuhan's interest and won global acclaim." See Granatstein, "Canada's best, they made us think -- and laugh," in *Maclean's*, July 1, 1998, p. 22. Finally, in its initiating issue for the year 2000, the magazine reviewed the best Canadian cultural products of the 20th century, and deemed Innis' *The Fur Trade* the best non-fiction work of the century, noting "this scholarly 1930 classic about traders and beaver hats accomplished the unlikely task of making Canadian economic history fascinating." in "Best of the Century," in *Maclean's*, January 1, 2000, p. 241.

⁵ Judith Stamps, *Unthinking Modernity: Innis, McLuhan and the Frankfurt School* (Montreal and Kingston: McGill-Queen's University Press, 1995): xvii.

⁶ Charles Acland and William Buxton, "Introduction," in *Harold Innis in the New Century: Reflections and Refractions* (Montreal and Kingston: McGill-Queen's University Press, 1999): 13.

⁷ Hugh G.J. Aitken, "Myth and Measurement: The Innis Tradition in Economic History," in *Journal of Canadian Studies*, 12 (Winter 1977): 96.

⁸ Acland and Buxton, "Introduction", 12.

⁹ Tom Cooper provides perhaps the best encapsulation of the disparate portraits that now populate the literature: "William Kuhns views Innis within the cluster of twentieth-century 'post-industrial prophets'; James Carey has viewed Innis within the perspective of communications study and the history of technology; Carl Berger has grouped Innis with prominent Canadian historians; Robin Neill has written of Innis the economist; Marshall McLuhan sees Innis as modern parent to the study of effects or 'formal cause'; while his closest colleagues, such as Vincent Bladen and Tom Easterbrook, have seen Innis primarily as they knew him, as a political economist and economic historian, respectively." See Cooper, "The Unknown Innis," in *Journal of Canadian Studies*, 12 (Winter 1977): 114. Judith Stamps notes that until the 1990s Innis' work was not widely viewed in an international context, a stance that worked to the detriment of the literatures devoted to Innis and communication theory: "The lack of extended comparisons may result from the iconic role that Innis and McLuhan have come to play in Canada. It is not a question of inattention. As many know, the two theorists have received considerable attention in Canada. But attention can take insidious forms. . . .In contemporary Canadian studies, as one theorist has noted, Innis is often ritualistically acknowledged and then avoided. . . .Recent texts on communication theory in Canada, useful and informative in their own right, support this judgment as well. Authors devote space to Innis's and McLuhan's work but carry out their own analyses without appealing to their insights. . . .For both Innis and McLuhan, the phrase 'technological determinism' had stuck so hard one gets the impression that 'uniquely Canadian' has become a polite phrase for 'uniquely crude' -- a theory with a roughly hewn set of concepts that, like the fur trade, is an interesting but odd spin-off of the Pre-Cambrian shield. . . .Most [critical literatures] look to Europe for theoretical inspiration, and few show awareness of Innis and McLuhan. The time has come to see the two Canadians' work in this broader context and to consider closely what they had to say about the making of the modern world." See Stamps, *Unthinking Modernity*, xiii-xv.

¹⁰ Acland and Buxton, "Introduction", 12.

¹¹ W.T. Easterbrook noted this trait in notes he made after a July 1952 visit with Innis: "Innis: July 11/52; mind extremely active -- physically, doubtful if holding his own, but still quite strong looking. Talk with Mrs. I.; extraordinary case of a state of mind which envisages nothing but continuing 'just as is' -- plans re future etc; unfort letter from Willits, sorry to hear you have cancer' -- why didn't you tell me -- but Harold, you knew this 2 yrs ago -- still no change in attitude -- my feeling is that death at this stage is so meaningless that simply not accepted as a fact -- not a rational matter -- no heroics, no act of will, just simply too

preposterous to believe -- feeling in talking with him that death out of the question -- so unreal. Problems for Mrs. I; no thought of making will or any plans re family if death occurs -- refusal to take sedatives in spite of pain which begins in evening; ver sever b mid-night -- but why take the stuff if getting better, is his attitude. Complained to me of difficulties re walking; doctor baffled, X-ray shows walking impossible, yet walks -- and doctor puzzled re attitude, says must know, no attempt to conceal, yet no sign of knowing. The real sufferer, his wife. Problems of 'understanding friends and relatives' -- 'must tell him' re nec of final arrangements -- concern with his 'religious outlook' -- Why Cassidy case so different? C. a romantic, calling in all friends at end, courageous acceptance -- no dramatics re Innis and no acceptance yet. Yet strong tendency to reminisce -- long talk of early devs in dept (see below) -- and writing [his] 'Memoirs' at great rate -- his reasoning faculties much too sharp 'not to know', highly skilled at reading between the lines -- but still refusal -- euphoria -- when does acceptance come, and what then? cancer spreading into hip, no hope, and yet I find myself accepting his attitude as I talk with him." See *W.T. Easterbrook Papers*, University of Toronto Archives, B75-0030/001.

¹² Babe, *Canadian Communication Thought*, 41; Stamps, *Unthinking Modernity*, 41.

¹³ Donald Creighton, *Harold Adams Innis: Portrait of a Scholar* (Toronto: University of Toronto Press, 1957): 21-23; Michael Gauvreau, "Baptist religion and the Social Science of Harold Innis," in *Canadian Historical Review*, 76(2): 169-171; Harold Innis, *The Bias of Communication* (Toronto: University of Toronto Press, 1995, c. 1951): xxvii. Toward the end of his life, Innis noted in his autobiography of Ten Broeke that he was "one of the most striking teachers" at McMaster":

The Baptist denomination, like other denominations at that time, was concerned with the pursuit of heresy, and with the expulsion on one or two occasions of members of the staff. But the name of Professor Ten Broeke, as far as I am aware, was never mentioned in this agitation, though he must have been far the most heretical thinker in the university. He opened up the subject of philosophy in such a way as to free those who sought to be free from the conventions of philosophical thought. I remember vividly his arguments with rather fervent evangelical students; never losing his temper but always arguing in the interests of a wider outlook. His books on the subject were primarily concerned with the problem of working out a philosophical basis for theology, when to the orthodox no such problem existed.

See *Harold Adams Innis Papers*, University of Toronto Archives, B72-0003/036, File 1: "Autobiography of HAI", p. 40.

¹⁴ Creighton, *Harold Adams Innis*, 31-32.

¹⁵ In *Political Economy in the Modern State*, which Innis published in 1946, he pressed his readership to recognise "how prodigal we have been with young life, our most cherished possession, and how careful we must be with that which has been left to us." A major portion of that realisation would involve answering a fundamental question: "Why has a century of comparative peace such as prevailed from the end of the Napoleonic wars to the beginning of the last war been followed by the breakdown of Western Civilization? Why has European civilization turned from persuasion to force or from ballots to bullets?" See Harold Innis, "The Problems of Rehabilitation", *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 57, 63.

¹⁶ Harold Innis, "The Work of Thorstein Veblen," in *Essays in Canadian Economic History* (Toronto: University of Toronto Press, 1956): 24.

¹⁷ Harold Innis, *The Fur Trade: An Introduction to Canadian Economic History*, revised edition (Toronto: University of Toronto Press, 1956, c. 1930): 383-386; Harold Innis, *The Cod Fisheries: The History of an International Economy* (Toronto: University of Toronto Press, 1954): 484-486.

¹⁸ See Harold Innis, *Political Economy in the Modern State*, Toronto: The Ryerson Press, 1946.

¹⁹ See Harold Innis, *Empire and Communications*, Oxford: The Clarendon Press, 1950; Harold Innis, *The Bias of Communication*, Toronto: University of Toronto Press, 1952.

²⁰ Creighton, *Harold Adams Innis*, 124-146. For a treatment of Innis' work with the Rockefeller Foundation, see Matthew D. Evenden, "Harold Innis, the Arctic Survey, and the Politics of Social Science during the Second World War," in *Canadian Historical Review* 79(1): 36-67. 1998; Eric Havelock, *Harold Innis: A Memoir*. (Toronto: The Harold Innis Foundation, 1982): 26. Havelock's exact formulation was more understated: "I hazard the opinion that his premature death constituted a minor disaster in the long history of the human understanding." (p. 26). Marshall McLuhan took Havelock to task for this in his introduction to Havelock's memoirs, noting that "I am somewhat dismayed by Havelock's remarks. . . . [He] is being overly modest." See McLuhan, "The Fecund Interval," in Havelock, *Harold Innis*, p. 10. Despite McLuhan's reservations, it is remarkable, and a measure of Havelock's respect, that a scholar of his stature should undertake such a memorial lecture commemorating Innis in 1978, and then publish the work in 1982. Innis' work generated a similar measure of respect from Northrop Frye, the renowned literary critic from the University of Toronto. In the early 1980s, he led a sadly unsuccessful effort to edit and publish Innis' unpublished *History of Communication*. The introduction he wrote for the effort was later published in Northrop Frye, "Harold Innis: The Strategy of Culture," in *The Eternal Act of Creation: Essays, 1979-1990*, ed. Robert D. Denham (Bloomington and Indianapolis: Indiana University Press, 1993): 154-167.

²¹ W.T. Easterbrook, "Innis and Economics," in *Canadian Journal of Economics and Political Science* 19 (1953): 291.

²² Robert Babe, *Canadian Communication Thought: Ten Foundational Writers*, (Toronto: University of Toronto Press, 2000): 53.

²³ Harold Innis, *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 113-115.

²⁴ Vincent di Norcia, "Communications, Time and Power: An Innisian View," in *Canadian Journal of Political Science*, 23 (2): 336-341; Vincent di Norcia, "Of Stone Books and Freedom," in *Visible Language*, 20(3): 347, Summer 1986; Paul Heyer, *Communications and History: Theories of Media, Knowledge, and Civilization* (New York: Greenwood Press, 1988): 115; Barrington Nevitt, *The Communication Ecology: Re-presentation versus Replica* (Toronto: Butterworth, 1982): 15; William Melody, "Introduction," in *Culture, Communication and Dependency*, eds. William H. Melody, Liora Salter and Paul Heyer (Norwood NJ: Ablex, 1981): 8; David Crowley, "'Harold Innis and the Modern Perspective of Communications,'" in *Culture, Communication, and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, NJ: Ablex, 1981): 236; James W. Carey, "Culture, Geography and Communications: The Work of Harold Innis in an American context," in *Culture, Communications and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood NJ: Ablex, 1981): 79-84; Judith Stamps, "Innis in the Canadian Dialectical Tradition," in *Harold Innis in the New Century: Reflections and Refractions* (Montreal and Kingston: McGill-Queen's University Press, 1999): 48-65; Ian Parker, "Innis, Marx, and the Economics of Communication: A Theoretical Aspect of Canadian Political Economy," in *Culture, Communication and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, New Jersey, 1981): 127-143; Ian Parker, "Innis and the Geography of Communications and Empire," in *Canadian Geographer*, 37 (4): 353-355; Cole Harris, "Innis on Early Canada," in *Canadian Geographer*, 37 (4): 355-357.

²⁵ Parker, "Innis, Marx," 129.

²⁶ Arthur Kroker, *Technology and the Canadian mind: Innis/McLuhan/Grant*, Montreal : New World Perspectives, 1984; Judith Stamps, *Unthinking Modernity: Innis, McLuhan, and the Frankfurt School*, Montreal and Kingston: McGill-Queen's University Press, 1995; Graeme Patterson, *History and Communications : Harold Innis, Marshall McLuhan, and the Interpretation of History*, Toronto: University of Toronto Press, 1990.

Chapter One: Constructs of Change

²⁷ Floyd Merrell, "Structuralism and Beyond: A Critique of Presuppositions," in *Frontiers in Semiotics*, eds. John Deely, Brooke Williams, and Felicia E. Kruse (Bloomington, IN: Indiana University Press, 1986): 132; Cited from Milic Capek, *The Philosophical Impact of Contemporary Physics*, (Princeton, NJ: Van Nostrand, 1961): 264.

²⁸ John Holland, *Emergence: From Chaos to Order* (Reading, MA: Addison-Wesley Publishing Company, 1998): 242; and John Holland, *Hidden Order: How Adaptation Builds Complexity* (Reading, MA: Perseus Books, 1995): 161-172.

²⁹ Merrell, "Structuralism and Beyond", 123-124.

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- ³⁰ Merrell, "Structuralism and Beyond", 123-126.
- ³¹ Alicia Juarrero, *Dynamics in Action : Intentional Behaviour as a Complex System* (Cambridge, MA: MIT Press, 1999): 21-23.
- ³² Merrell, "Structuralism", 124, 126-127.
- ³³ Merrell, "Structuralism", 124.
- ³⁴ Juarrero, *Dynamics*, 22.
- ³⁵ M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York: Touchstone Books, 1992): 145.
- ³⁶ John Holland, *Emergence: From Chaos to Order* (Reading, MA: Addison-Wesley Publishing Company, 1998): 5-6, 13-14, 225-227; Juarrero, *Dynamics*, 120, 122-123.
- ³⁷ Holland, *Emergence*, 7, 227; Juarrero, *Dynamics*, 124-125.
- ³⁸ Waldrop, *Complexity*, 145-146.
- ³⁹ Juarrero, *Dynamics*, 122-123.
- ⁴⁰ Juarrero, *Dynamics*, 122.
- ⁴¹ Holland, *Emergence*, 226.
- ⁴² Holland, *Emergence*, 225.
- ⁴³ Juarrero, *Dynamics*, 119.
- ⁴⁴ Juarrero, *Dynamics*, 119-120.
- ⁴⁵ Juarrero, *Dynamics*, 120.
- ⁴⁶ Waldrop, *Complexity*, 106-108.
- ⁴⁷ Waldrop, *Complexity*, 109-112.
- ⁴⁸ James Gleick notes, however, that periods of order emerge even after the control parameter has shifted the system into a state of turbulence, or chaos: "Windows of Order Inside Chaos -- Even with the simplest equation, the regions of chaos in a bifurcation diagram [of an equation modelling rates of population growth and decline] proves to have an intricate structure First, the bifurcation produce periods of 2, 4, 8, 16 Then chaos begins, with no regular periods. But then, as the system is driven harder [by the control parameter], windows appear with odd periods. A stable period 3 appears . . . and then the period-doubling begins again: 6, 12, 24." See Gleick, *Chaos: Making a New Science* (New York: Penguin Books, 1987): 74; Alicia Juarrero also notes with respect to Benard Cells that: "Increased heat is the order or control parameter that drives the Benard cells away from equilibrium toward a bifurcation in the case of Benard cells, moreover, the heat level is altered from the outside. If the amount of heat is reduced, Benard cells disintegrate, if it is increased further, the water abruptly becomes 'turbulent.' Scientists used to think that turbulence was disorderly; only recently did they discover that the seemingly 'chaotic' behaviour of turbulence is in fact a highly complex form of order." See Juarrero, *Dynamics*, 120.
- ⁴⁹ Waldrop, *Complexity*, 293.
- ⁵⁰ Juarrero, *Dynamics*, 111.
- ⁵¹ Waldrop, *Complexity*, 121-122.
- ⁵² Waldrop, *Complexity*, 123-124.
- ⁵³ Juarrero, *Dynamics*, 126.
- ⁵⁴ Juarrero, *Dynamics*, 127.
- ⁵⁵ Waldrop, *Complexity*, 177.

⁵⁶ Juarrero, *Dynamics*, 127.

⁵⁷ Paul Heyer, *Communications and History: Theories of Media, Knowledge, and Civilization* (New York: Greenwood Press, 1988): 115. Vincent di Norcia has also noted the presence of non-linear dynamics in Innis' histories. See di Norcia, "Communications, Time and Power: An Innisian View," in *Canadian Journal of Political Science*, 23 (2): 348. David Crowley has noted the "causal nexus of change" in Innis' histories are characterised by "the way in which holistically distinct realities arose out of former ones. The task he set for the historian was the mapping of these epochs in terms of the conditions and sequences attending the shift from one form of communication to the other." See Crowley, "Harold Innis and the Modern Perspective of Communications," in *Culture, Communication, and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, NJ: Ablex, 1981): 236. Also see Horace Gray, "Reflections on Innis and Institutional Economics," in *Culture, Communication and Dependency* eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, NJ: Ablex, 1981): 101-102.

⁵⁸ Judith Stamps, *Unthinking Modernity: Innis, McLuhan and the Frankfurt School* (Montreal and Kingston: McGill-Queen's University Press, 1995): 18, 56. Also see Meric Gertler, "Harold Innis and the New Industrial Geography," in *The Canadian Geographer*, 37(4): 361, 1993; Marshall McLuhan, "The Later Innis," in *Queen's Quarterly* 60(Autumn 1953): 392.

⁵⁹ On the importance of disequilibrium in Innis' writings, see Mel Watkins, "The Innis Tradition in Canadian Political Economy," in *Canadian Journal of Political and Social Theory*, 6(1-2): 20, Spring/Winter 1982; Daniel Drache, "Harold Innis and Canadian Capitalist Development," in *Canadian Journal of Political and Social Theory*, 6(1-2): 36-42; Robin Neill, "Rationality and the Information Environment: A Reassessment of the Work of Harold Adams Innis," in *Journal of Canadian Studies*, 22(4): 85, Winter 1987-1988; Daniel Drache, "Introduction: Celebrating Innis: The Man, the Legacy, and Our Future," in *Harold Innis. Staples, Markets and Cultural Change*, ed. Daniel Drache (Montreal and Kingston: McGill-Queen's University Press, 1995): xxxix.

⁶⁰ Graeme Patterson, *History and Communications : Harold Innis, Marshall McLuhan, the Interpretation of History* (Toronto: University of Toronto Press, 1990): 8; William Melody, "Introduction," in *Culture, Communication and Dependency*, eds. William H. Melody, Liora Salter and Paul Heyer (Norwood NJ: Ablex, 1981): 8; Vincent di Norcia, "Of Stone Books and Freedom," in *Visible Language*, 20(3): 347, Summer 1986; Ian Parker, "Innis, Marx, and the Economics of Communication: A Theoretical Aspect of Canadian Political Economy," in *Culture, Communication and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, New Jersey, 1981): 130.

⁶¹ Abraham Rotstein, "Innis: The Alchemy of Fur and Wheat," in *Journal of Canadian Studies*, 12 (Winter 1977): 7. Ian Parker was particularly taken with Innis' choice of cognitive bias as a framework to study ancient cultures because of "the relatively 'persistent' and 'cumulative' character of 'bias', its relative temporal invariance." This feature, Parker argues, enables bias to "serve as an analytical focus and an escape from the indeterminacy of the Heraclitean flux." see Parker,

"Harold Innis: Staples, Communications, and the Economics of Capacity, Overhead Costs, Rigidity, and Bias," in *Explorations in Canadian Economic History: Essays in Honour of Irene M. Spry*, ed. Duncan Cameron. (Ottawa: University of Ottawa Press, 1985): 91.

Ian Angus sees similar persistence in Innis' studies of mental constructs associated with the Oral Tradition. As Angus describes it, Innis described a regime of communication in which "the structure of speech in an oral society tends to be additive rather than analytic. In analytic thought, one subordinates the higher category to the lower, and example to the general theory, whereas within orality, one tends to simply add on without any clear pattern of subordination or hierarchy. This key role of memory is extremely important in primary orality, and exerts a formative influence on the whole of societies in which orality is the only, or major, medium of communication. Oral society is homeostatic due to the continuous incorporation of the past into the present. There is no way for that which has really been forgotten to survive. Consequently, oral society orients much of its energy toward not forgetting, towards continuously re-enacting the past in the present. . . .Originality or creativity does not reside so much in making up new stories but in the quality of its enactment or performance. The oral mind is oriented towards narrative accounts, stories rather than lists." See Angus, "Orality in the twilight of humanism: a critique of the communication theory of Harold Innis," in *Continuum: The Australian Journal of Media and Culture*. 7(1) 1993. Available On-line:

<http://www.mcc.murdoch.edu.au/ReadingRoom/7.1/Angus.html>. [June 18, 2001].

⁶² Marshall McLuhan, "Introduction," in Harold Innis, *The Bias of Communication* (Toronto: University of Toronto Press, 1971): x; Patterson, *History and Communications*, 137; Robin Neill, *A New Theory of Value: The Canadian Economics of H. A. Innis* (Toronto, University of Toronto Press, 1972): 26-27; 123-124.

⁶³ Michael Gauvreau, "Baptist religion and the Social Science of Harold Innis," in *Canadian Historical Review*, 76(2): 187; William Christian notes: "The second problem that gave Innis reservations about making settled causal claims was his intense faith in human creativity and the power of thought to transcend circumstances. The first of these aspects is suggested in *The Fur Trade* and *The Cod Fisheries* in his undisguised admiration for the adaptability of the fur traders in the woods beyond the control of their monopolist would-be directors, or the fishermen . . . frustrating the attempts of parliament and vested interests. A further element here reflects a problem that has teased all would-be determinists. If the medium of communication determined what was thought, how could Innis claim that he had escaped the impact of mechanized print culture in his pleas for time and his biases for the Oral Tradition?" See Christian, "Harold Innis as Political Theorist," in *Canadian Journal of Political Science*, 10 (1): 21-42. March 1977.

⁶⁴ Parker, "Innis, Marx", 129.

Chapter Two: The Fur Trade

⁶⁵ See Bernard Bailyn, "The Idea of Atlantic History", in *Itinerario*, 20(1): 19-44, 1996; Silvia Marzagalli, "The French Atlantic," in *Itinerario*, 23(2): 70-83; David Eltis, "Atlantic History in Global Perspective," in *Itinerario*, 23(2): 141-161; Deborah Gray White, "'Yes', There is a Black Atlantic," in *Itinerario*, 23(2): 127-140; Carla Rahn Phillips, "The Iberian Atlantic," in *Itinerario*, 23(2): 84-107; Pieter C. Emmer and Willem W. Klooster, "The Dutch Atlantic, 1600-1800: Expansion without Empire," in *Itinerario*, 23(2): 48-69; and Eliga H. Gould, "A Virtual Nation: Greater Britain and the Imperial Legacy of the American Revolution," in *American Historical Review*, 104(2): 476-489, April 1999; J.G.A. Pocock, "The New British History in Atlantic Perspective: An Antipodean Commentary," in *American Historical Review*, 104(2): 490-500, April 1999.

⁶⁶ See A.R.M. Lower, *Great Britain's Woodyard: British America and the timber trade, 1763-1867*, Montreal and Kingston: McGill-Queen's University Press, 1973; John Bartlet Brebner, *North Atlantic triangle: the interplay of Canada, the United States and Great Britain* (Toronto: The Ryerson Press, 1945).

⁶⁷ William Buxton and Charles Acland, "Harold Innis: A Genealogy of Contesting Portraits," in *Harold Innis in the New Century: Reflections and Refractions*, eds. Charles R. Acland and William J. Buxton (Montreal and Kingston: McGill-Queen's University Press, 1999): 12-13.

⁶⁸ See David Hancock, "The British Atlantic World: Co-ordination, Complexity, and the Emergence of an Atlantic Market Economy, 1651-1815," in *Itinerario*, 23(2): 107-126.

⁶⁹ In 1979 W. J. Eccles wrote a harshly critical review of Innis' *The Fur Trade in Canada*, one in which he charged that Innis' account was wrong in almost every respect: "The sweeping generalisations and conclusions of this work have been accepted uncritically by too many later historians. Unfortunately, neither his premises, both stated and unstated, his use of historical evidence, nor the conclusions drawn will stand up to close scrutiny and all too many erroneous interpretations of North American history have been made up in consequence. . . . Innis, however, took economic determinism to extremes and grossly exaggerated the role of the fur trade in the history of both North America and Europe." See Eccles, "A Belated Review of Harold Adams Innis, *The Fur Trade in Canada*," in *Canadian Historical Review*, 60(4): 420, December 1979. Eccles argued that Innis improperly emphasised the importance of the fur trade to the French economy. In fact, more revenue was generated from plantation colonies in the West Indies. The French maintained their presence in the fur trade as a means to acquire military alliances with the First Nations, an important consideration in its competition with Britain for hegemony over North America. Contrary to Innis, Eccles argued the internal organisation of the French economy was not affected by the fur trade, and suffered no material disarrangement after the fur trade collapsed. Innis' claims that the superiority of British goods, cheaper prices, and Britain's advantageous location in Hudson Bay enabled it to gain supremacy in the fur trade during the 18th century were also incorrect, according to Eccles. In fact, the British trade lost market share and was in dire straits in the years before

the conquest. Consequently, Innis' claim that New France collapsed because of internal economic stress was also wrong according to Eccles. Eccles' review provoked a rejoinder from Hugh Grant two years later, in which he charged Eccles with offering "a critique of Innis's work without fully understanding it." Innis' purpose in writing *The Fur Trade*, according to Grant, was to demonstrate the trade's "systemic relationship to the broader interests of the European states." In misunderstanding Innis' purpose, Eccles produced a review with a "welter of theoretical conclusions and factual errors." see Grant, "One Step Forward, Two Steps Back: Innis, Eccles, and the Canadian Fur Trade," in *Canadian Historical Review*, 62(3): 305, 306, 313. Eccles responded in the same issue with a spirited defence, accusing Grant of being "determined to demonstrate that Harold A. Innis brought his work *The Fur Trade in Canada* down the mountain engraved on stone tablets." He further charged Grant with failing to do his homework, basing his refutations of Eccles' specific points on readings from the secondary literature, not primary research. See Eccles, "A Response to Hugh M. Grant on Innis," in *Canadian Historical Review*, 62(3): 323. The response in the literature to this debate has been equivocal. Several scholars have addressed Grant's charge that Eccles failed to see the forest for the trees by rejoining that without trees there can be no forest. John Hutcheson notes that Eccles did "sustain the claim that Innis overemphasized the significance of the fur trade in the North American theatre of the clash between Britain and France It is also true that Innis did push his conclusions to extremities, and Grant's reply does not do much to refute Eccles' specific points." see Hutcheson, "Harold Innis and the Unity and Diversity of Confederation," in *Journal of Canadian Studies*, 17(4): 71 n7. In 1999, William Buxton and Charles Acland rendered a similar verdict, noting Hugh Grant's defence was "informed more by the championing of general principles of political economic analysis than by claims for the accuracy of Innis's depiction of the fur trade." See Buxton and Acland, "Contesting Portraits," 27 n15. Significantly, Arthur Ray, a historian of the fur trade, wrote a ringing endorsement of the work in an introduction for the 1999 reprint of *The Fur Trade*. Ray suggested that Innis had in fact been correct on several points of contention, particularly those relating to English success in the fur trade, and concluded that "Innis's great book remains essential reading for the study of Canada." see Ray, "Introduction", in *The Fur Trade in Canada*, (Toronto: University of Toronto Press, 1999, c. 1930): xi-xii, xix.

⁷⁰ See for example Kenneth Buckley, "The Role of Staple Industries in Canada's Economic Development," in *Journal of Economic History*, 18(December 1958): 439-450; and Douglas McCalla, "The Ontario Economy in the Long Run," in *Ontario History*, 90(2): 97-116. Autumn 1998.

⁷¹ Mel Watkins, "A Staple Theory of Economic Growth," in *Canadian Journal of Economics and Political Science*, 29(2): 141-158. May 1963; Mel Watkins, "The Staple Theory Revisited," in *Journal of Canadian Studies*, 12(5): 83-95. Winter 1977; Mel Watkins, "The Innis Tradition in Canadian Political Economy," in *Canadian Journal of Political and Social Theory*, 6(1-2): 12-33. Spring/Winter 1982. Daniel Drache, "Harold Innis and Canadian Capitalist Development," in *Canadian Journal of Political and Social Theory*, 6(1-2): 35-60. Winter-Spring

1982; Hutcheson, "Unity and Diversity," 58; Marc Egnal, *New World Economies: The Growth of the Thirteen Colonies and Early Canada*, (New York: Oxford University Press, 1998): 4-5.

⁷² Robin Neill was especially harsh in his criticism, arguing that "Economic history in Canada has been buried and the epitaph chosen has been 'The Staple Theory.' . . . Its effects on our ability to come to grips with the basic problems of the Canadian economy is already evident. . . . It is not the staple thesis of the 1930s that has done the damage, but its more recent appearances as a staple theory of economic growth. Over the past twenty years partisan scholars have pressed the thesis into service on every side in the debate over growth. . . . With the theoretical approach emphasis is placed on making the facts speak for the theory. . . . Theoretical revisions of the staple thesis put forward by the proponents of the New Economic History on the one side and the Neo-Marxians, on the other, illustrate the point. . . . In this version the staple thesis is not a theory of growth. It is a theory of stagnation. It is, nonetheless, a non-historical, normative theory in the same sense as the neoclassical version. And again the proponents assert that the historical facts of the Canadian case have conformed to the norm, or, rather the anti-norm. The same activities of government that were used by North to illustrate the neoclassical theory have been used by Watkins, Naylor and others (e.g. Scheinberg) to show the reactionary character of Canadian governments. Any evidence to the contrary, such as the adoption of the National Policy in 1878, has been reinterpreted to fit the assumed pattern. Again the implications for policy have not had to be spelled out." See Robin Neill, "The Passing of Canadian Economic History." in *Journal of Canadian Studies*. 12 (Winter 1977): 73-74. Hugh Aitken has also denied that Innis' writings can be characterised as offering an operational model of development. See Aitken, "Myth and Measurement: The Innis Tradition in Economic History," in *Journal of Canadian Studies* 12 (5): 96. Outside the Watkins debate, Vincent di Norcia has also resisted the premise that Innis' philosophy of history can be characterised as progressive, see di Norcia, See Vincent di Norcia, "Communications, Time and Power: An Innisian View." in *Canadian Journal of Political Science*. 23 (2): 350.

⁷³ Aitken, "Myth and Measurement", 96; Cole Harris, "Innis on Early Canada," in *Canadian Geographer*. 37 (4): 355-357; Robin Neill, "Imperialism and the Staple Theory of Canadian Economic Development: The Historical Perspective," in *Culture, Communication and Dependency*. Eds. William H. Melody, Liora Salter, and Paul Heyer. (Norwood, NJ: Ablex, 1981): 153. Watkins himself conceded in 1977 that his theory "attempted to pull out of more diffuse historical writings, notably by Innis, an explicit theory of economic growth appropriate to Canada and other 'new' countries. . . . At least in retrospect, its contribution was to give legitimacy to the staples approach . . . but this was bought at the high price of constraining the theory to the very limiting paradigm of orthodox economics One response to my 1963 paper by Innisians was that it emasculated Innis." see Watkins, "The Staple Theory Revisited," 83, 93 n4; Carl Berger has noted that Innis' contemporaries also oversimplified his writings, drawing on his work selectively in order to reinforce nationalist themes, particularly the belief that Canada was not an artificial construct but rather rested on a geographic unity

demonstrated by the activities of the fur trade. Innis was interpreted as a geographic determinist to reinforce nationalist aims. See Berger, *The Writing of Canadian history : Aspects of English-Canadian Historical Writing since 1900* (Toronto: University of Toronto Press, 1986): 97-102. More recent contributions, however, have drawn the opposite conclusion, noting Innis' appeals to human purpose and culture as important variables in Canada's economic history. See di Norcia, "Communications," 336, 341; Meric Gertler, "Harold Innis and the New Industrial Geography," in *The Canadian Geographer*. 37 (4): 360-363, 1993; Grant, "One Step", 320; Horace Gray, "Reflections on Innis and Institutional Economics," in *Culture, Communication and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, NJ: Ablex, 1981): 99-110; John Warkentin, "Canada and Its Major Regions: Bouchette, Parkin, Rogers, Innis, Hutchison," in *The Canadian Geographer*, 43(3): 257, 1999.

⁷⁴ Alexander C. Dow, "Technology, Demand and Canadian Base Metal Markets, 1900-1950," in *British Journal of Canadian Studies*, 8(1): 18-41, 1993; James Bickerton, "Too Long in Exile: Innis and Maritime Political Economy," in *Harold Innis in the New Century: Reflections and Refractions*, eds. Charles R. Acland and William J. Buxton (Montreal and Kingston: McGill-Queens University Press, 1999): 237; Ian Angus, and Brian Shoosmith. "Dependency/space/policy: an introduction to a dialogue with Harold Innis." in *Continuum: The Australian Journal of Media and Culture*. 7(1) 1993. Section II, paragraph 4. Available On-line:

<http://wwwmcc.murdoch.edu.au/ReadingRoom/7.1/Angus&S.html>. [June 18, 2001].

As early as 1954, J.M.S. Careless, in his classic article "Frontierism, Metropolitanism, and Canadian History," resisted the notion that Canada or any region of Canada should be characterised as a dependent of any Imperial centre. Careless suggested that the Frontier Hypothesis, the proposition that Canadian social and cultural characteristics were the derivative of settler interaction with the local environment, had run its course in Canadian historiography. In its place, he credited Innis and other historians with forwarding the Metropolitan hypothesis, the belief that Canadian development was partly determined by its ties with Europe, primarily Britain. Careless was careful to note, however, that the relationship was characterised by interaction, not domination: "If we reject a frontier determinism we should hardly replace it with a metropolitan determinism." See Careless, "Frontierism, Metropolitanism, and Canadian History," in *Canadian Historical Review*, 35(1): 19. March 1954.

⁷⁵ James W. Carey, "Culture, Geography and Communications: the work of Harold Innis in an American context," in *Culture, Communications and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood NJ: Ablex, 1981): 81; Marc Egnal, *New World Economies: The Growth of the Thirteen Colonies and Early Canada* (New York: Oxford University Press, 1998): 5. Also see Daniel Drache, "Introduction -- Celebrating Innis: The Man, The Legacy, and Our Future," in *Staples, Markets and Cultural Change*, ed. Daniel

Drache (Montreal and Kingston: McGill-Queen's University Press, 1995): xiii-lx.

One reason for the discrepancy in the literature's characterisation of Innis - as either a proponent of dependency theory or as a proponent of an ecological construct of economic change -- has been the imprecise nature of his prose. A. John Watson notes that "there is still no clear consensus on what Innis and his life's work were about. Everyone agrees that he was an outstanding scholar. But the concern has been with using his work rather than understanding it, with attempts to enlist his authority in posthumous support for this or that point of view. In consequence, he has been variously viewed as an incipient fascist, an anarchist, a radical democrat, an elitist and the forerunner of current Marxist scholarship in Canada. Furthermore, there are passages from his work which seem to support each one of these interpretations." See A. John Watson, "Harold Innis and Classical Scholarship," in *Journal of Canadian Studies*, 12 (Winter 1977): 45-61.

A second difficulty has been the lack of a clear analytical focus in the writings of Innis and other proponents of the staples hypothesis. In 1961 Richard Caves and Richard Holton noted that "this interpretation of Canadian development has won almost unanimous acceptance among scholars and the general public as well. True, it is not always clear what is thought to be determined by changes in Canada's staple exports. One infers that, for the early years at least, the usual answer to this question is 'everything'." See Caves and Holton, *The Canadian Economy: Prospects and Retrospect*. (Cambridge, MA: Harvard University Press, 1961): 30.

One unfortunate outcome of the imprecision in the staples literature is that scholars have sometimes simultaneously identified the Innis tradition as a theory of dependency, and interdependency. Judith Stamps, for example, suggests that Innis' historical writings "offered a dialectical reading of the West as the historical battlefield between imperial and marginal areas. It developed a negative version of that dialectic by emphasising the contingent rather than the positive aspects of that history and by-seeing margins rather than empire as the 'cutting edge' of historical change. In so doing, it described a fluid world beyond the strictures of dualism, a world in whose light one could see history as a process that was simultaneously integrated and decentred." In other words, with control distributed, Stamps saw Innis as describing a relationship characterised by interaction. The problem, however, is that Stamps also suggests Innis' histories contain a narrative in which the centre dominates the periphery: "He saw, instead of the happy road to global integration, a vortex -- an industrial core with a spatializing momentum that drove it constantly to exploit its surroundings. . . . He saw, instead of the Enlightenment road to progress, violence -- the centrist drive to suppress manufacturing at the margins, the better to colonize them as markets." See Stamps, *Unthinking Modernity* (Montreal and Kingston, McGill-Queen's University Press, 1995): 56, 57.

In 1959, Hugh Aitken, whose writings were inspired by Innis, offered a similar contradictory assessment of the degree of agency that Canada historically has enjoyed in the international economy. On the one hand, Aitken maintained

that Canada "has never been the master of its own destiny, as a satellite staple-producing economy, it reflected, and still reflects, in its rate of development the imperatives of more advanced areas." Yet, Aitken also suggested that Canada's growth was linked to endogenous concerns: "Canada today exists as a national economy because its reactions to external pressure have been predominantly positive. That this should be the case was not in any sense necessary or inevitable: it resulted from distinct political and economic decisions. The strategic decisions in the process of economic growth in Canada have historically been such as to promote the creation, integration, and growth of a national economy north of the United States boundary." See Hugh G.J. Aitken, "The Changing Structure of the Canadian Economy, in Hugh G.J. Aitken et al. eds. *The American Economic Impact on Canada* (Durham, NC: Duke University Press, 1959): 3, 4; and Hugh G.J. Aitken, "Myth and Measurement: The Innis Tradition in Economic History," in *Journal of Canadian Studies*. 12 (Winter 1977): 96.

⁷⁶ Harold Innis, *A History of the Canadian Pacific Railway* (Toronto: University of Toronto Press, 1971, c. 1923): xx.

⁷⁷ Robert Babe, *Canadian Communication Thought: Ten Foundational Writers* (Toronto: University of Toronto Press, 2000): 52.

⁷⁸ Harold Innis, "The Work of Thorstein Veblen" in *Essays in Canadian Economic History* (Toronto: University of Toronto Press, 1956): 19. This essay originally appeared in *Southwestern Political and Social Science Quarterly*, 10 (1929): 56-68.

⁷⁹ Innis, "Thorstein Veblen", 22.

⁸⁰ Innis, "Thorstein Veblen", 25.

⁸¹ Innis, "Thorstein Veblen", 24.

⁸² In economics, these assumptions are referred to as the economics of diminishing returns, and were systematised in the late 19th century by Alfred Marshall in his *Principles of Economics*. See W. Brian Arthur, "Increasing Returns and the New World of Business," in *Harvard Business Review*. 74(4): 100-101. July-August 1996.

⁸³ Innis, "Thorstein Veblen", 24.

⁸⁴ Innis, "Thorstein Veblen", 19, 21.

⁸⁵ Innis, "Thorstein Veblen", 24. Innis writes: "In the same year [1892] in an article on socialism in the *Annals of the American Academy* he attempted to explain the causes of discontent which he regarded as due to jealousy and envy. One passage was a prelude to the *Theory of the Leisure Class*: 'As we are all aware the chief element of value in many articles of apparel is not their efficiency for protecting the body but for protecting the wearer's respectability and that not only in the eyes of one's neighbors but even one's own eyes . . .'." Innis, "Thorstein Veblen", 20.

⁸⁶ Innis, "Thorstein Veblen", 22.

⁸⁷ Innis, "Thorstein Veblen", 25.

⁸⁸ Innis, "Thorstein Veblen", 24.

⁸⁹ Innis, "Thorstein Veblen", 25.

⁹⁰ Innis, "Thorstein Veblen", 24.

⁹¹ Innis, "Thorstein Veblen", 26.

⁹² Innis, "Thorstein Veblen", 26.

⁹³ Innis, "Thorstein Veblen", 26, n42.

⁹⁴ This reading differs from other commentators who have taken a stance directly opposite that of Watkins, suggesting that Innis' histories amount to little more than concrete case studies. In this interpretation, Innis never intended for his theories to be applied to any other locale save Canada. See Babe, *Canadian Communication Thought*, 63-64; Berger, *Writing of Canadian History*, 85-94; Harris, "Innis on Early Canada", 355-356; Neill, "Passing of Canadian Economic History", 73-76; Daniel Czitrom, *Media and the American Mind: From Morse to McLuhan* (Chapel Hill, NC: University of North Carolina Press, 1982): 150; Trevor Barnes, "Knowing Where You Stand: Harold Innis, Staple Theory, and Local Models," in *Canadian Geographer*. 37 (4): 357-358. As we shall see at the end of Chapter Three, this study takes a position that differs from Watkins and the interpreters cited above, one argued by William Christian: "Innis treated Canada not as a unique phenomenon, but as a particular one. In the particularity of Canada Innis could see manifestations of universal, or at least general principles; . . ." See Christian, "Harold Innis as Political Theorist," in *Canadian Journal of Political Studies*, 10(1): 21. March 1977.

⁹⁵ Innis, "Thorstein Veblen", 26.

⁹⁶ Harold Innis, *The Fur Trade in Canada: An Introduction to Canadian Economic History*, revised edition (Toronto: University of Toronto Press, 1956, c. 1930): ix.

⁹⁷ Alicia Juarrero, *Dynamics in Actions: Intentional Behavior as a Complex System* (Cambridge, MA: The MIT Press, 1999): 105-106.

⁹⁸ Juarrero, *Dynamics*, 106-107.

⁹⁹ Juarrero, *Dynamics*, 107.

¹⁰⁰ Ernst Cassirer, *The Problem of Knowledge: Philosophy, Science, and History since Hegel*, trans. William H. Woglom and Charles W. Hendel (New Haven: Yale University Press, 1950): 121-122.

¹⁰¹ Juarrero, *Dynamics*, 109.

¹⁰² Innis, *Canadian Pacific Railway*, 287.

¹⁰³ Innis, *Canadian Pacific Railway*, 288.

¹⁰⁴ Innis, *Canadian Pacific Railway*, 289.

¹⁰⁵ Innis, *Canadian Pacific Railway*, 293.

¹⁰⁶ Harold Innis, "Autobiography of Harold Adams Innis," *Harold Adams Innis Papers*, University of Toronto Archives, B72-0003, Box 36, File 1, p. 125.

¹⁰⁷ Harold Innis, "Autobiography of Harold Adams Innis," *Harold Adams Innis Papers*, *University of Toronto Archives*, B72-0003, Box 36, File 1, p. 125.

¹⁰⁸ Harold Innis, "Forest Industries in Canada," in *Pacific Affairs* (September 1929): 551-552; Harold Innis, "Pulp and Paper Industries," *Encyclopedia of Canada*, (5): 176-185; Harold Innis, "The Lumber Trade in Canada," in *Essays in Canadian Economic History* (Toronto: University of Toronto Press, 1956): 242-251.

¹⁰⁹ Harold Innis, "Agriculture", *Encyclopedia of Canada* (1): 16-23; Harold Innis and M.L. Jacobson, "Agriculture and Canadian-American Trade," *Canadian Papers*, 3(6): 17.

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- ¹¹⁰ Harold Innis, *The Cod Fisheries: The History of an International Economy* (Toronto: The Ryerson Press, 1940).
- ¹¹¹ Harold Innis, *Settlement and the Mining Frontier*, eds. W.A. Mackintosh and W.L.G. Joerg, Canadian frontiers of settlement series, IX (Toronto: The MacMillan Company, 1936).
- ¹¹² Harold Innis, "Autobiography of Harold Adams Innis," *Harold Adams Innis Papers*, University of Toronto Archives, B72-0003, Box 36, File 1, p. 126.
- ¹¹³ A. John Watson, "Marginal Man: Harold Innis' Communication Works in Context." (Doctoral dissertation in political science, University of Toronto, 1981): 193.
- ¹¹⁴ Harold Innis, "Autobiography of Harold Adams Innis," *Harold Adams Innis Papers*, University of Toronto Archives, B72-0003, Box 36, File 1, p. 127.
- ¹¹⁵ Daniel Drache, "Canadian Capitalist Development," 39. Cited from W.A. MacIntosh, "Economic Factors in Canadian History," in *Approaches to Canadian Economic History*, eds. W.T. Easterbrook and M.H. Watkins (Toronto: McLelland and Stewart, 1967): 15.
- ¹¹⁶ Innis, *The Fur Trade*, 393.
- ¹¹⁷ On this point, see J.M.S. Careless, "Frontierism, Metropolitanism, and Canadian History," in *Canadian Historical Review*, 35(1): 1-21. March 1954.
- ¹¹⁸ Innis, *The Fur Trade*, 383-384; Careless, "Frontierism," 15; Hutcheson, "Unity and Diversity," 59; Berger, *Writing of Canadian History*, 96-97.
- ¹¹⁹ Innis, *The Fur Trade*, 383-4, 386.
- ¹²⁰ Innis, *The Fur Trade*, 31-32, 33.
- ¹²¹ Innis, *The Fur Trade*, 111-112.
- ¹²² Innis, *The Fur Trade*, 111-112.
- ¹²³ Robin Neill, *A New Theory of Value: The Canadian Economics of H.A. Innis*, (Toronto: University of Toronto Press, 1972): 26-27; 123-124.
- ¹²⁴ Innis, *The Fur Trade*, 41-42.
- ¹²⁵ Innis, *The Fur Trade*, 390-391.
- ¹²⁶ Juarrero, *Dynamics*, 109.
- ¹²⁷ Innis, *Fur Trade*, 83.
- ¹²⁸ Innis, *The Fur Trade*, 38.
- ¹²⁹ Innis, *The Fur Trade*, 78-79, 88, 110-111.
- ¹³⁰ Innis, *The Fur Trade*, 176.
- ¹³¹ Innis, *The Fur Trade*, 166-169.
- ¹³² Innis, *The Fur Trade*, 177.
- ¹³³ Innis, *The Fur Trade*, 117-118.
- ¹³⁴ Innis, *The Fur Trade*, 280.
- ¹³⁵ Innis, *The Fur Trade*, 251, 256-257, 279-280.
- ¹³⁶ Innis, *The Fur Trade*, 385.
- ¹³⁷ Innis, *The Fur Trade*, 393.
- ¹³⁸ Innis, *The Fur Trade*, 393-395.
- ¹³⁹ Innis, *The Fur Trade*, 395-397.
- ¹⁴⁰ Innis, *The Fur Trade*, 393.
- ¹⁴¹ Innis, *The Fur Trade*, 396.
- ¹⁴² Innis, *The Fur Trade*, 401.

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- ¹⁴³ Innis, *The Fur Trade*, 395.
¹⁴⁴ Innis, *The Fur Trade*, 396.
¹⁴⁵ Innis, *The Fur Trade*, 397.
¹⁴⁶ Innis, *The Fur Trade*, 400-401.
¹⁴⁷ Innis, *The Fur Trade*, 396.
¹⁴⁸ Innis, *The Fur Trade*, 397.
¹⁴⁹ Innis, *The Fur Trade*, 397.
¹⁵⁰ Innis, *The Fur Trade*, 397.
¹⁵¹ Harold Innis, "Introduction," *Empire and Communications* (Oxford: Clarendon Press, 1950): 5.
¹⁵² Juarrero, *Dynamics*, 126.
¹⁵³ Innis, *The Fur Trade*, 401.
¹⁵⁴ This reading is further indicated by Innis' characterisation of Nova Scotia politics in 1839. Noting the same tension between authority, in this case the "centralisation of the commercial group at Halifax", and independence, "the decentralizing tendencies of trade, fishing, and other industries." Innis argued the outcome of the specific conflict over the colony's tariff policies was a shift to responsible government:

The convergence of different racial, religious, and economic groups, together with the Imperial influence that was likewise concentrated in Halifax as a naval center, contributed to the "intellectual awakening of Nova Scotia" and to that balancing of interests which made her the cradle of responsible government in the "Second Empire". (See Innis, *The Cod Fisheries*, 489.)

- ¹⁵⁵ Innis, *The Fur Trade*, 385.
¹⁵⁶ Innis, *The Fur Trade*, 385.

Chapter Three: *The Cod Fisheries*

- ¹⁵⁷ Harold Innis, *The Cod Fisheries: The History of an International Economy* (Toronto: The Ryerson Press, 1940): ix.
¹⁵⁸ See Chapter 4 of the *Cod Fisheries*, pp. 52-94.
¹⁵⁹ Innis, *The Cod Fisheries*, xi.
¹⁶⁰ Innis, *The Cod Fisheries*, x.
¹⁶¹ Harold Innis, "An Introduction to the Economic History of the Maritimes, Including Newfoundland, and New England," in *Essays in Canadian Economic History*, ed. Mary Q. Innis (Toronto: University of Toronto Press, 1962, c. 1956): 42.

¹⁶² Kenneth Arrow, "Foreword", in W. Brian Arthur, *Increasing Returns and Path Dependence in the Economy* (Ann Arbor: University of Michigan Press, 1994): ix.

¹⁶³ In Canada, Innis' influence waned rapidly after he died. In the discipline of economics most economists embraced the tenets of neo-classical economics propounded by American economists such as Milton Friedman at the University of Chicago. By the 1970s most Canadian economic historians had also foresworn Innis' political economy in favour of the "new economic history", a second American intellectual import, and one with a strong orientation toward quantitative history. See Mel Watkins, "The Innis Tradition in Canadian Political Economy," in *Canadian Journal of Political and Social Theory* 6(1-2): 13-17. Spring 1982. For more general assessments of Innis' influence in Canadian historiography, see William Westfall, "The Ambivalent Verdict: Harold Innis and Canadian History," in *Culture, Communication and Dependency: The Tradition of H.A. Innis* (Norwood, NJ: Ablex Publishing Corporation, 1982): 37-51; and Carl Berger, *The Writing of Canadian History: Aspects of English-Canadian Historical Writing since 1900*, second edition (Toronto: University of Toronto Press, 1986): 85-111; 187-207.

¹⁶⁴ W. Brian Arthur, "Positive Feedbacks in the Economy," at http://www.santafe.edu/~wba/Papers/Pdf_files/SciAm_Article.pdf [September 5, 2001], p. 5. The article is also available in print version. See Arthur, "Positive Feedbacks in the Economy," in *Scientific American*, 262 (February 1990): 92-99.

¹⁶⁵ W. Brian Arthur, "Increasing Returns and the Two Worlds of Business," at http://www.santafe.edu/~wba/Papers/Pdf_files/HBR.pdf [September 5, 2001], pp. 2-3. The same article appears in print in Arthur, "Increasing Returns and the New World of Business," in *Harvard Business Review*, 74(4): 100-111, July-August 1996.

¹⁶⁶ Arthur, "Positive Feedback," 1.

¹⁶⁷ W. Brian Arthur, "Preface," at <http://www.santafe.edu/~wba/Books/Preface.html> [September 5, 2001], para. 3; The same article appears in print version, see Arthur, "Preface," in *Increasing Returns and Path Dependence in the Economy*. (Ann Arbor: University of Michigan Press, 1994). For a general overview of Arthur's work see H. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos*, (New York: Touchstone, 1992.): 15-51. Aside from applying the concept of increasing-returns to systems with competing firms and technologies, Arthur has also applied it to questions relevant to spatial economics, including industry location patterns, and the development of urban systems. See Arthur, "Urban Systems and Historical Path Dependence," in *Increasing Returns and Path Dependence in the Economy*, (Ann Arbor: University of Michigan Press, 1994): 99-110; and Arthur, "Industry Location Patterns and the Importance of History," in *Increasing Returns*, 49-67.

¹⁶⁸ Arthur, "Preface", para. 6.

¹⁶⁹ Arthur, "Increasing Returns", 2-3.

¹⁷⁰ Arthur, "Positive Feedback", 5.

¹⁷¹ Arthur, "Positive Feedback," 8.

¹⁷² Arthur, "Increasing Returns," 3-4.

¹⁷³ Arthur, "Increasing Returns," 3. For more on network effects, see Stephen E. Margolis and Stanley J. Liebowitz, *Winners, Losers and Microsoft: Competition and Antitrust in High Technology*, <http://www.pub.utdallas.edu/~liebowit/book/chapter1.html> [September 5, 2001], "Section D: Two's Company; Three's a Network," paras. 27-32. Also available in print. See Chapter 1 of Margolis and Liebowitz, , *Winners, Losers and Microsoft: Competition and Antitrust in High Technology*, Oakland, CA: Independent Institute, 1999.

¹⁷⁴ Arthur, "Increasing Returns," 3. Economists often refer to this characteristic as the QWERTY effect, in reference to the standard keyboard found on most English language typewriters and keyboards. With reference to typing speed it is not the most efficient keyboard design, but it has persisted due to widespread customer use. See Arthur, "Positive Feedback," 9.

¹⁷⁵ Harold Innis, "The Rise and Fall of the Spanish Fishery in Newfoundland," in *Essays in Canadian Economic History* (Toronto: University of Toronto Press, 1962, c. 1956): 58.

¹⁷⁶ Innis, "Spanish Fishery", 44-46.

¹⁷⁷ Innis, "Spanish Fishery", 44.

¹⁷⁸ Innis, "Spanish Fishery", 44.

¹⁷⁹ Innis, "Spanish Fishery", 45, 47, 52, 53.

¹⁸⁰ Innis, "Spanish Fishery", 46.

¹⁸¹ Innis, "Spanish Fishery", 46-47.

¹⁸² Innis, "Spanish Fishery", 48-49.

¹⁸³ Innis, "Spanish Fishery", 50-51.

¹⁸⁴ Innis, "Spanish Fishery", 47.

¹⁸⁵ Innis, "Spanish Fishery", 55.

¹⁸⁶ Innis, "Spanish Fishery", 56.

¹⁸⁷ Innis, "Spanish Fishery", 55.

¹⁸⁸ Innis, "Spanish Fishery", 56.

¹⁸⁹ Innis, "Spanish Fishery", 57-58.

¹⁹⁰ Innis, "Spanish Fishery", 58.

¹⁹¹ Innis, "Spanish Fishery", 57.

¹⁹² Innis, "Spanish Fishery", 57.

¹⁹³ Innis, "Spanish Fishery", 60.

¹⁹⁴ Innis, "Spanish Fishery", 60.

¹⁹⁵ Innis, "Spanish Fishery", 60.

¹⁹⁶ Kenneth Arrow notes that the Scottish political economist's writings on specialisation are increasingly being recognised as early forays into the economics of increasing-returns. See Arrow, "Foreword", *Increasing Returns*, ix.

¹⁹⁷ Harold Innis, "Autobiography of Harold Adams Innis", *Harold Adams Innis Papers*, University of Toronto Archives, B72-0003/036. pp. 39-40.

¹⁹⁸ Innis, "Economic History of the Maritimes", 39.

¹⁹⁹ Innis, *Cod Fisheries*, 11-52.

²⁰⁰ Innis, *Cod Fisheries*, 32,49,177.

²⁰¹ Innis, "Economic History", 31; Innis, *Cod Fisheries*, 51-52.

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- ²⁰² Innis, *Cod Fisheries*, 46-47, 49, 50, 81, and 136.
²⁰³ Innis, *Cod Fisheries*, 130.
²⁰⁴ Innis, "Economic History", 31.
²⁰⁵ Innis, *Cod Fisheries*, 91.
²⁰⁶ Innis, *Cod Fisheries*, 34, 41-42.
²⁰⁷ Innis, *Cod Fisheries*, 42.
²⁰⁸ Innis, *Cod Fisheries*, 52.
²⁰⁹ Innis, "Economic History", 61; and Innis, *Cod Fisheries*, 65.
²¹⁰ Innis, *Cod Fisheries*, 35, 66.
²¹¹ Innis, *Cod Fisheries*, 67-68, 73-76, 81, 93-94.
²¹² Innis, *Cod Fisheries*, 90-91.
²¹³ Innis, *The Fur Trade*, 31-33; and Innis, *Cod Fisheries*, 81-92.
²¹⁴ Innis, *Cod Fisheries*, 91. Also see Innis, *Cod Fisheries*, 500.
²¹⁵ Innis, *Cod Fisheries*, 94.
²¹⁶ Innis, *Cod Fisheries*, 91-92, 505.
²¹⁷ Innis, *Cod Fisheries*, 70; and Innis, "Economic History", 32.
²¹⁸ Innis, *Cod Fisheries*, 97-102.
²¹⁹ See for example Innis, *Cod Fisheries*, 165.
²²⁰ Innis, *Cod Fisheries*, 53, 100-101.
²²¹ Innis, *Cod Fisheries*, 137.
²²² Innis, *The Fur Trade*, 133.
²²³ Innis, *Cod Fisheries*, 90, 117, 118, 133, 137; Innis, "Economic History", 32.
²²⁴ Innis, *Cod Fisheries*, 78, 501.
²²⁵ Innis, *Cod Fisheries*, 78, 79, 114.
²²⁶ Innis, *Cod Fisheries*, 79, 114.
²²⁷ Innis, *Cod Fisheries*, 120-131, 505.
²²⁸ Arthur, "Increasing Returns", 5.
²²⁹ Arthur, "Increasing Returns", 5.
²³⁰ Innis, *Cod Fisheries*, 175.
²³¹ Innis, "Economic History", 29.
²³² Innis, *Cod Fisheries*, 485-486.
²³³ Innis, *Cod Fisheries*, 503.
²³⁴ Innis, *Cod Fisheries*, 503.
²³⁵ Innis, *Cod Fisheries*, 175.
²³⁶ Innis, "Economic History", 28.
²³⁷ See Waldrop, *Complexity*, 121-124.
²³⁸ Innis, *Cod Fisheries*, 51.
²³⁹ Innis, *The Cod Fisheries*, 500-501.
²⁴⁰ Innis, "Economic History", 40.
²⁴¹ Innis, *Cod Fisheries*, 174-175.
²⁴² Innis, *Cod Fisheries*, 137.
²⁴³ Innis, *Cod Fisheries*, 78.
²⁴⁴ Innis, *Cod Fisheries*, 115, 118.
²⁴⁵ Innis, *Cod Fisheries*, 115, 117.
²⁴⁶ Innis, *Cod Fisheries*, 161.
²⁴⁷ Innis, "Economic History", 34.

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- ²⁴⁸ Innis, *Cod Fisheries*, 161-164.
²⁴⁹ Innis, *Cod Fisheries*, 213.
²⁵⁰ Innis, *Cod Fisheries*, 164.
²⁵¹ Innis, *Cod Fisheries*, 114.
²⁵² Innis, *Cod Fisheries*, 165.
²⁵³ Innis, *Cod Fisheries*, 165, 201.
²⁵⁴ Harold Innis, "Autobiography of Harold Adams Innis", *Harold Adams Innis Papers*, University of Toronto Archives, B72-0003/036. pp. 39-40.
²⁵⁵ Innis, *Cod Fisheries*, 174, 176.
²⁵⁶ Innis, *Cod Fisheries*, 176, 505.
²⁵⁷ Innis, *Cod Fisheries*, 178-179.
²⁵⁸ Innis, *Cod Fisheries*, 505.
²⁵⁹ Innis, *Cod Fisheries*, 504.
²⁶⁰ Innis, *Cod Fisheries*, 202.
²⁶¹ Innis, *Cod Fisheries*, 202.
²⁶² Innis, *Cod Fisheries*, 203, 504.
²⁶³ Innis, *Cod Fisheries*, 201.
²⁶⁴ Innis, *Cod Fisheries*, 210-211.
²⁶⁵ Innis, *Cod Fisheries*, 205-206.
²⁶⁶ Innis, *Cod Fisheries*, 502.
²⁶⁷ Innis, *Cod Fisheries*, 504.
²⁶⁸ Innis, *Cod Fisheries*, 230.
²⁶⁹ Innis, *Cod Fisheries*, 373.
²⁷⁰ Innis, *Cod Fisheries*, 489.
²⁷¹ Innis, *Cod Fisheries*, 284; 489.
²⁷² Innis, *Cod Fisheries*, 372-373.
²⁷³ William Christian, "Harold Innis as Political Theorist," in *Canadian Journal of Political Science* 10(1): 30, March 1977.
²⁷⁴ Innis, *Cod Fisheries*, 504.
²⁷⁵ Innis, *Cod Fisheries*, 212.
²⁷⁶ Joel Mokyr, "Review: Jared Diamond, *Guns, Germs and Steel: The Fates of Human Societies*" at *EH.Net* Available On-Line:
<http://www2.h-net.msu.edu/reviews/showrev.cgi?path=31456896896145>
[September 13, 2001], para. 3.

Chapter Four: *Political Economy in the Modern State*

- ²⁷⁷ Donald Creighton, *Harold Adams Innis: Portrait of a Scholar* (Toronto: University of Toronto Press, 1957): 111-112; W.T. Easterbrook, "Innis and Economics," in *Canadian Journal of Economics and Political Science*, 19(1953): 292; Carl Berger, *The Writing of Canadian History: Aspects of English-Canadian Historical Writing since 1900*, second edition (Toronto: University of Toronto Press, 1986): 188.

- ²⁷⁸ See Doug Owram, *The Government Generation: Canadian Intellectuals and the State, 1900-1945* (Toronto: University of Toronto Press, 1986): 166, 213, 268; A. John Watson, "Marginal Man: Harold Innis' Communication Works in Context," (Ph.D. diss., University of Toronto, 1981): 310; Philip Massolin, "Academic Modernization and the Decline of Higher Learning: The University Question in the later Scholarship of Harold Innis," in *Canadian Journal of Communication*, 23(1): 45-64, (Winter 1998); Berger, *Canadian History*, 187-188; Ian Angus, "Orality in the twilight of humanism: a critique of the communication theory of Harold Innis," in *Continuum: The Australian Journal of Media and Culture*, 7(1) 1993, Par. 12; Available On-line: <http://wwwmcc.murdoch.edu.au/ReadingRoom/7.1/Angus.html>. [June 18, 2001].
- ²⁷⁹ Innis's words here are taken from Plato's *Phaedrus*. Innis provides no citation. See Innis, "Preface", in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): vii.
- ²⁸⁰ Innis, "Preface", vii-xvi.
- ²⁸¹ Innis, "Preface", xvi.
- ²⁸² Daniel Czitrom, *Media and the American Mind: From Morse to McLuhan*, (Chapel Hill, NC: University of North Carolina Press, 1982): 149, 155; Graeme Patterson, *History and Communications: Harold Innis, Marshall McLuhan and the Interpretation of History* (Toronto: University of Toronto Press, 1990): 3; Trevor Barnes, "Knowing Where You Stand: Harold Innis, Staple Theory, and Local Models," in *Canadian Geographer*, 37 (4): 357-359; Barrington Nevitt, *The Communication Ecology: Re-presentation versus Replica* (Toronto: Butterworth, 1982): 15.
- ²⁸³ William J. Buxton, "Harold Innis' Excavation of Modernity: The Newspaper Industry, Industry, Communications, and the Decline of Public Life," in *Canadian Journal of Communication*, 23(2) 1998. Available On-line: <http://www.cjc-online.ca/~cjc/BackIssues/23.3/buxton.art.html>. Par. 8. [June 18, 2001].
- ²⁸⁴ Judith Stamps, *Unthinking Modernity: Innis, McLuhan and the Frankfurt School* (Montreal and Kingston: McGill-Queen's University Press, 1995): 70.
- ²⁸⁵ Mel Watkins, "The Innis Tradition in Canadian Political Economy," in *Canadian Journal of Political and Social Theory*, 6(1-2): 16. Spring/Winter 1982; Ian Angus, "Orality in the twilight of humanism: a critique of the communication theory of Harold Innis," in *Continuum: The Australian Journal of Media and Culture*. 7(1) 1993. Available On-line: <http://wwwmcc.murdoch.edu.au/ReadingRoom/7.1/Angus.html>. Para. 11-17. [June 18, 2001].
- ²⁸⁶ Leslie Pal, "Scholarship and the Later Innis," in *Journal of Canadian Studies*, 12(Winter 1977): 32.
- ²⁸⁷ William Buxton and Charles Acland, "Harold Innis: A Genealogy of Contesting Portraits," in *Harold Innis in the New Century: Reflections and Refractions*, eds. Charles R. Acland and William J. Buxton (Montreal and Kingston: McGill-Queen's University Press, 1999): 12; Paul Heyer, *Communications and History: Theories of Media, Knowledge and Civilization*, (New York: Greenwood Press, 1988): 117.

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- ²⁸⁸ Heyer, *Communications and History*, 117.
- ²⁸⁹ Creighton, *Harold Adams Innis*, 110.
- ²⁹⁰ Harold Innis, "Industrialism and Cultural Values", in *The Bias of Communication* (Toronto: University of Toronto Press, 1991, c. 1951): 141.
- ²⁹¹ Harold Innis, "Political Economy in the Modern State", in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 103. Cited from First Baron Acton, *The History of Freedom and Other Essays* (London, 1922): 17.
- ²⁹² Innis, "Political Economy", 107.
- ²⁹³ Innis, "Political Economy", 108-109.
- ²⁹⁴ Innis, "Political Economy", 115.
- ²⁹⁵ Innis, "Political Economy", 114. Cited from Jacob Viner, "Adam Smith and Laissez Faire," in *Adam Smith, 1776-1926* (Chicago, 1928): 116-117.
- ²⁹⁶ Innis, "Political Economy", 114. Cited from Acton, *History of Freedom*, 28.
- ²⁹⁷ Harold Innis to Arthur Cole, March 19, 1945, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1. With respect to the entrepreneur Innis wrote to Cole: "I have a feeling that this is a subject of fundamental significance to Western civilization and that we had not raised the question as to why the American entrepreneur occupied a crucial position. . . . I suspect that the entrepreneur approach touches every phase of American cultural activity and is appreciated by very few of those concerned with it other than by way of contempt." see Harold Innis to Arthur Cole, no date -- probably 1945, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ²⁹⁸ Harold Innis to W.T. Easterbrook, no date, *Easterbrook Papers*, University of Toronto Archives, B75-0030/001.
- ²⁹⁹ Innis, "Political Economy", 116. Cited from *More Letters of Charles Darwin* (London, 1903), Vol. 1, p. 118.
- ³⁰⁰ Alicia Juarrero, *Dynamics in Action: Intentional Behaviour as a Complex System* (Cambridge, MA: The MIT Press, 1999): 107-109.
- ³⁰¹ Innis, "Political Economy", 117.
- ³⁰² Harold Innis, "On the Economic Significance of Cultural Factors", in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 100.
- ³⁰³ Harold Innis to Arthur Cole, October 21, 1941, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ³⁰⁴ Harold Innis, "The Newspaper in Economic Development", in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 34.
- ³⁰⁵ Innis, "Political Economy", 127.
- ³⁰⁶ Innis, "Political Economy", 127, cited from Geoffrey Scott, *The Architecture of Humanism* (London, 1926), p. 163.
- ³⁰⁷ Innis, "Political Economy", 127.
- ³⁰⁸ Harold Innis to Arthur Cole, April 2, 1943, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ³⁰⁹ Innis, "Cultural Factors", 89.
- ³¹⁰ Harold Innis to Arthur Cole, October 31, 1941, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ³¹¹ Harold Innis to Arthur Cole, October 31, 1941, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.

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- ³¹² Harold Innis to Arthur Cole, October 31, 1941, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ³¹³ Innis, "Cultural Factors", 89.
- ³¹⁴ Innis, "Industrialism and Cultural Values", 141.
- ³¹⁵ In May 1941 Innis told Cole: "I feel that we are on solid ground in our general approach and that we have an opportunity to make a major contribution. If we could answer questions as to why the 'pax Britannica' existed for the century 1815-1914 and why it collapsed we might throw some light on the conditions for an enduring peace. We run grave risks of producing mole's eye views of history unless we keep the larger major problems in mind. We should be able to break or weaken the grip which political history has stamped on economic history and obtain a clearer perspective on the precise limitations of nationalism as shown in the modern state." Harold Innis to Arthur Cole, May 2, 1941, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ³¹⁶ Harold Innis, "The Problems of Rehabilitation", in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 57.
- ³¹⁷ Innis, "Problems of Rehabilitation", 63.
- ³¹⁸ Innis, "The Newspaper", 34.
- ³¹⁹ Owsram, *Government Generation*, 166, 268.
- ³²⁰ Berger, *Canadian History*, 102.
- ³²¹ Innis, "Political Economy", 141; Harold Innis, "Preface", in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): xvi-xvii.
- ³²² Innis, "Political Economy", 134.
- ³²³ Innis, "Cultural Factors", 89.
- ³²⁴ Innis, "The Newspaper", 32.
- ³²⁵ Innis, "Preface", xvi.
- ³²⁶ Innis, "Preface", vii.
- ³²⁷ Innis, "Preface", vii-viii.
- ³²⁸ Innis, "The Newspaper", 30.
- ³²⁹ Harold Innis, "An Economic Approach to English Literature in the Nineteenth Century," in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 35.
- ³³⁰ Stephen Kern, *The Culture of Time and Space: 1880-1918* (Cambridge, MA: Harvard University Press, 1983): 221-222.
- ³³¹ Innis, "English Literature", 55, fn 41.
- ³³² Innis, "Cultural Factors", 98-99.
- ³³³ Innis, "Cultural Factors", 95.
- ³³⁴ Innis, "Political Economy", 121. Cited from Mark Pattison, *Essays by the Late Mark Pattison*, ed. Henry Nettleship, vol. II (Oxford, 1889): 298-299.
- ³³⁵ Innis, "Political Economy", 121. Cited from John Morley, *On Compromise* (London, 1921): 61.
- ³³⁶ Innis, "Cultural Factors", 100.
- ³³⁷ Innis, "English Literature", 55.
- ³³⁸ Innis, "Cultural Factors", 95.
- ³³⁹ Innis, "Preface", xiv.
- ³⁴⁰ Innis, "Cultural Factors", 95.

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- ³⁴¹ Innis, "Preface", xiii-xiv.
- ³⁴² Innis, "Cultural Factors", 92, 98.
- ³⁴³ Innis, "Cultural Factors", 97; Innis, "Political Economy", 143.
- ³⁴⁴ Innis, "Political Economy", 116-117.
- ³⁴⁵ Innis, "Problems of Rehabilitation", 57.
- ³⁴⁶ Innis, "The Newspaper", 5-6.
- ³⁴⁷ Innis, "Cultural Factors", 93.
- ³⁴⁸ Innis, "Problems of Rehabilitation", 59.
- ³⁴⁹ Innis, "Cultural Factors", 95, cited from John Russell Young, M.D.R. Young, ed., *Men and Memories: Personal Reminiscences* (New York and London: F.T. Neely, 1901): 271.
- ³⁵⁰ Innis, "Problems of Rehabilitation", 57.
- ³⁵¹ Innis, "Cultural Factors", 95.
- ³⁵² Innis, "Problems of Rehabilitation", 59.
- ³⁵³ Innis, "Cultural Factors", 94, cited from Moritz Busch, *Bismarck: Some Secret Pages of his History* (New York: The Macmillan Company, 1898), Vol. II, p. 175.
- ³⁵⁴ Innis, "The Newspaper", 22.
- ³⁵⁵ See "A Plea for the University Tradition", pp. 64-71; "The University in the Modern Crisis", pp. 72-82; in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946).
- ³⁵⁶ Innis, "The Newspaper", 21.
- ³⁵⁷ Innis, "The Newspaper", 21.
- ³⁵⁸ Innis, "Political Economy", 95.
- ³⁵⁹ Innis, "Problems of Rehabilitation", 58. Quotes cited from H.W. Steed, *Through Thirty Years* (New York, 1924), Vol I, p. 412; Charles Lowe, *The Tale of a "Times" correspondent: Berlin 1878-1891* (London, n.d.) p. 207.
- ³⁶⁰ Harold Innis, "Paper and the Printing Press", in *Empire and Communications* (Oxford: Clarendon Press, 1950): 208.
- ³⁶¹ Innis, "English Literature", 35.
- ³⁶² Innis, "English Literature", 36-37.
- ³⁶³ Innis, "English Literature", 37.
- ³⁶⁴ Innis, "English Literature", 50.
- ³⁶⁵ Innis, "English Literature", 42. Cited from M.M. Bevington, *The Saturday Review, 1855-1868* (New York, 1941), p. 162.
- ³⁶⁶ Innis, "English Literature", 45, 51.
- ³⁶⁷ Innis, "English Literature", 50-51.
- ³⁶⁸ Innis, "English Literature", 51-52. Cited from E.A. Bennett, *Fame and Fiction* (London, 1932): 13.
- ³⁶⁹ Innis, "Cultural Factors", 102.
- ³⁷⁰ Innis, "Cultural Factors", 101.
- ³⁷¹ Innis, "Cultural Factors", 91.
- ³⁷² Harold Innis, "The Problem of Space," in *The Bias of Communication* (Toronto: University of Toronto Press, 1991, c. 1951): 126, 128.
- ³⁷³ Harold Innis, "Chapter 6: Printing in the Sixteenth Century", in "History of Communication", *Harold Innis Papers*, University of Toronto Archives, B72-003, Box 17, pp. 35-36, 38.

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- ³⁷⁴ Harold Innis, "Chapter 6: Printing in the Sixteenth Century", in "History of Communication", *Harold Innis Papers*, University of Toronto Archives, B72-003, Box 17, pp. 38-39.
- ³⁷⁵ Innis, "Problem of Space", 128.
- ³⁷⁶ Harold Innis, "Address on Education", no date, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 23, File 4, p. 1.
- ³⁷⁷ Innis, "Cultural Factors", 101.
- ³⁷⁸ James Gleick, *Chaos: Making A New Science* (Markham, ON: Penguin Books, 1987): 49-52.
- ³⁷⁹ Innis, "Cultural Factors", 83.
- ³⁸⁰ Harold Innis to W.T. Easterbrook, June 7, 1952, *Easterbrook Papers*, University of Toronto Archives, B75-0030/001.
- ³⁸¹ Innis, "Cultural Factors", 84-85.
- ³⁸² Innis, "Cultural Factors", 86-87.
- ³⁸³ Robin Neill, "Economic Historiography in the 1950s: The Saskatchewan School," in *Journal of Canadian Studies* 34(3): 254, Fall 1999.
- ³⁸⁴ Norbert Wiener, "My connection with cybernetics," in ed. P. Mesani, *Norbert Wiener: Collected Works with Commentaries*, vol IV (Cambridge, MA: The MIT Press, 1985): 107-120. Harold Innis to Marshall McLuhan, February 26, 1951, March 14, 1951, *Harold Innis Papers*, University of Toronto Archives, B72-0003, Box 5, Folder 18, "Correspondence with M. McLuhan, H.J. Cody, G.M. Weir, and A.L. MacDonald." [1939-1952]". William Christian notes that Innis read *Cybernetics* himself in late 1951 or early 1952. See Innis, *The Idea File of Harold Adams Innis*, ed. William Christian (Toronto: University of Toronto Press, 1980): 265.
- ³⁸⁵ Norbert Wiener, *Cybernetics: or Control and Communication in the Animal and Machine*, 2nd Edition (Cambridge, MA: The MIT Press, 1961, c. 1948): 61.
- ³⁸⁶ Neil A. Gershenfeld and Andreas S. Weigend, "The Future of Time Series: Learning and Understanding", in eds. A.S. Weigend and N.A. Gershenfeld, *Time Series Prediction: Forecasting the Future and Understanding the Past* (Reading MA: Addison-Wesley Publishing Company, 1994): 2.
- ³⁸⁷ Alicia Juarrero, *Dynamics in Action: Intentional Behaviour as a Complex System* (Cambridge, MA: The MIT Press, 1999): 138.
- ³⁸⁸ Gershenfeld and Weigend, "The Future", 2.
- ³⁸⁹ Wiener, "Connection", 120.
- ³⁹⁰ Norbert Wiener, "Measure and Probability", *Norbert Wiener Papers*, MIT Archives, MC22, Box 31D, Folder 799, p. 3
- ³⁹¹ Norbert Wiener, "Causality and Information", *Norbert Wiener Papers*, MIT Archives, MC22, Box 29C, Folder 687, p. 1-3
- ³⁹² Norbert Wiener, "Measure and Probability", p. 6.
- ³⁹³ Wiener, "Connection", 14.
- ³⁹⁴ Juarrero, *Dynamics*, 134.
- ³⁹⁵ Ibid.
- ³⁹⁶ Ibid.
- ³⁹⁷ Ibid, 136.
- ³⁹⁸ Ibid.

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- ³⁹⁹ Ibid, 122-123.
⁴⁰⁰ Ibid, 136-138.
⁴⁰¹ Norbert Wiener, "Measure and Probability", p. 9.
⁴⁰² Ibid.
⁴⁰³ Wiener, "Connection", 120.
⁴⁰⁴ Norbert Wiener, "Measure and Probability", pp. 9-10.
⁴⁰⁵ Norbert Wiener, "The Extrapolation, Interpolation, and Smoothing of Stationery Time Series: With Engineering Applications." *Norbert Wiener Papers*, MIT Press, MC22, Box 28A, Folder 561A, p. 37. Wiener published this manuscript in 1949. Also see the conclusion of Chapter 1 in *Extrapolation, Interpolation, and Smoothing of Stationery Time Series : With engineering applications* (Cambridge, MA: The MIT Press, 1966, c. 1949).
⁴⁰⁶ Harold Innis to Arthur Cole, October 31, 1941, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
⁴⁰⁷ On this point, see Robin Neill, *A New Theory of Value: The Canadian Economics of H.A. Innis* (Toronto: University of Toronto Press, 1972): 50-61. Also see Harold Innis, "The Penetrative Powers of the Price System," in *Political Economy In the Modern State* (Toronto: The Ryerson Press, 1946): 166.
⁴⁰⁸ Harold Innis to Arthur Cole, October 31, 1941, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
⁴⁰⁹ Ibid.
⁴¹⁰ Ibid.

Chapter Five: *Empire and Communications* and *The Bias of Communication*

- ⁴¹¹ Hugh G.J. Aitken, "Myth and Measurement: The Innis Tradition in Economic History," in *Journal of Canadian Studies*, 12 (Winter 1977): 96.
⁴¹² Donald Creighton reports that Innis in his 1947 presidential address to the *Royal Society of Canada* remained "unhappily conscious of his prolixity." To compensate, he read his "whole, detailed, highly condensed argument" in a "hurried and unemphatic fashion. Many in his audience were puzzled or bewildered. . . ." The address "Minerva's Owl" became the first chapter of Innis' 1952 study, *The Bias of Communication*. See Donald Creighton, *Harold Adams Innis: Portrait of a Scholar* (Toronto: University of Toronto Press, 1957): 126.
⁴¹³ Robert Babe, *Canadian Communication Thought: Ten Foundational Writers* (Toronto: University of Toronto Press, 2000): 54.
⁴¹⁴ Creighton, *Harold Adams Innis*, 126, 132.
⁴¹⁵ Innis, "Introduction", *Empire*, 3.
⁴¹⁶ Ian Parker notes that the cumulative and persistent character of constructs of change offered Innis an important advantage in his study of cultural history, namely "an analytical focus and an escape from the indeterminacy of the Heraclitean flux." See Parker, "Harold Innis: Staples, Communications, and the Economics of Capacity, Overhead Costs, Rigidity and Bias," in *Explorations in*

Canadian Economic History: Essays in Honour of Irene M. Spry, ed. Duncan Cameron (Ottawa: University of Ottawa Press, 1985): 91.

⁴¹⁷ Judith Stamps notes that "Innis has been read as a mechanist so often that the point is worth repeating. Innis never offered a determinist version of history based on certain media or binary sets of oppositional media." See Judith Stamps, *Unthinking Modernity: Innis, McLuhan, and the Frankfurt School* (Montreal and Kingston: McGill-Queen's University Press, 1995): 67. Two contemporary characterisations of Innis as a technological determinist include Daniel Czitrom, *Media and the American Mind: From Morse to McLuhan*. (Chapel Hill, NC: University of North Carolina Press, 1982): 156; and Robert Cox, "Civilizations: Encounters and Transformations." in *Studies in Political Economy: A Socialist Review*. (Summer 1995) no. 47: 156.

⁴¹⁸ See William Buxton, "Harold Innis' Excavation of Modernity: The Newspaper Industry, Communications, and the Decline of Public Life," in *Canadian Journal of Communication*, 23(3): 321-340. 1998. Available On-line: <http://www.cjc-online.ca/~cjc/BackIssues/23.3/buxton.art.html>, [June 18, 2001]; William Christian, "Harold Innis as Political Theorist," in *Canadian Journal of Political Science*, 10 (1): 29-30, March 1977; Vincent di Norcia, "Communications, Time and Power: An Innisian View," in *Canadian Journal of Political Science*, 23 (2): 341; Eric Havelock, *Harold Innis: A Memoir* (Toronto: The Harold Innis Foundation, 1982): 38; Ian Parker, "Innis, Marx, and the Economics of Communication: A Theoretical Aspect of Canadian Political Economy," in *Culture, Communication and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, New Jersey, 1981): 133; A. John Watson, "Harold Innis and Classical Scholarship." in *Journal of Canadian Studies*, 12 (Winter 1977): 53-55;

⁴¹⁹ David Crowley, "Harold Innis and the Modern Perspective of Communications," in *Culture Communications and Dependency*, eds. William H. Melody, Liora Salter, and Paul Heyer (Norwood, NJ: Ablex, 1981): 236; Vincent di Norcia, "Of Stone Books and Freedom," in *Visible Language*, 20(3): 347, Summer 1986; Ian Parker, "Innis and the Geography of Communications and Empire." in *Canadian Geographer*, 37 (4): 353-355.

⁴²⁰ William Buxton complains that Innis scholars in their attempts to unearth "clearly articulated claims and propositions" from *Empire and Communications* and *The Bias of Communication* have limited themselves to "key sections from these works as the basis for generating claims about the meaning of Innis' work." The emphasis by interpreters on Innis' statements regarding the space-binding or time-binding properties of media has hindered their appreciation of a crucial element in Innis' narrative, namely "how the printing complex -- in varying ways and through multiple guises -- has been implicated in the onslaught of modernity." see Buxton, "Harold Innis' Excavation of Modernity: The Newspaper Industry, Communications, and the Decline of Public Life," in *Canadian Journal of Communication*, 23(2) 1998. Available On-line: <http://www.cjc-online.ca/~cjc/BackIssues/23.3/buxton.art.html>. [June 18, 2001]

⁴²¹ Innis, "Introduction", *Empire*, 5-6.

⁴²² Innis, "Introduction", *Empire*, 6.

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- ⁴²³ Innis, "Introduction", *Empire*, 5.
- ⁴²⁴ Innis, "Preface", in *The Bias of Communication* (Toronto: The University of Toronto Press, 1995, c. 1951): xvii.
- ⁴²⁵ Innis, "Introduction", *Empire*, 6-7.
- ⁴²⁶ Innis, "Introduction", *Empire*, 10-11.
- ⁴²⁷ Innis, "Introduction", *Empire*, 5.
- ⁴²⁸ Harold Innis, "Minerva's Owl," in *The Bias of Communication* (Toronto: University of Toronto Press, 1995, c. 1951): 4.
- ⁴²⁹ Innis, "Introduction", *Empire*, 7; Harold Innis, "Babylonia," in *Empire and Communications* (Oxford: Clarendon Press, 1950): 30-63.
- ⁴³⁰ Harold Innis, "The Bias of Communication," in *The Bias of Communication* (Toronto: University of Toronto Press, 1995): 33.
- ⁴³¹ Innis, "Introduction", *Empire*, 7.
- ⁴³² Innis, "Bias", 34.
- ⁴³³ Innis, "Minerva", 4.
- ⁴³⁴ Innis, "Bias", 34.
- ⁴³⁵ Northrop Frye, "Harold Innis: The Strategy of Culture," in *The Eternal Act of Creation: Essays, 1979-1990*, ed. Robert D. Denham (Bloomington and Indianapolis: Indiana University Press, 1993): 155.
- ⁴³⁶ Innis, "Minerva", 7-11.
- ⁴³⁷ Harold Innis, "The Oral Tradition and Greek Civilization" in *Empire and Communications* (Oxford: The Clarendon Press, 1950): 81.
- ⁴³⁸ Innis, "Oral", 81-82.
- ⁴³⁹ Innis, "Oral", 83; and Innis, "Bias", 42.
- ⁴⁴⁰ Innis, "Bias", 42; Innis, "Oral", 76, 80-81; and "Innis, "Minerva", 7.
- ⁴⁴¹ Innis, "Oral", 76.
- ⁴⁴² Innis, "Oral", 77. Cited from Werner Jaeger, *The Theology of the Early Greek Philosophers* (Oxford, 1947): 16.
- ⁴⁴³ Innis, "Oral", 80.
- ⁴⁴⁴ Innis, "Space", 110; and Innis, "Oral", 78.
- ⁴⁴⁵ Innis, "Bias", 42.
- ⁴⁴⁶ Innis, "Oral", 78-79. Also see Innis, "Space", 111-112.
- ⁴⁴⁷ Innis, "Bias", 42.
- ⁴⁴⁸ Innis, "Oral", 82; Innis, "Bias", 41-42; Innis, "Minerva", 7; and Innis, "Space", 106-107.
- ⁴⁴⁹ Innis, "Oral", 83-84; Innis, "Bias", 42; and Innis, "Space", 107.
- ⁴⁵⁰ Innis, "Oral", 83, 85; and Innis, "Bias", 42.
- ⁴⁵¹ Innis, "Oral", 86; Innis, "Minerva", 8; Innis, "Space", 107; and Innis, "Bias", 42.
- ⁴⁵² Innis, "Space", 107.
- ⁴⁵³ Innis, "Oral", 86; and Innis, "Bias", 42.
- ⁴⁵⁴ Innis, "Bias", 42.
- ⁴⁵⁵ Innis, "Oral", 86.
- ⁴⁵⁶ Innis, "Bias", 42.
- ⁴⁵⁷ Innis, "Oral", 87.
- ⁴⁵⁸ Innis, "Oral", 86-87.

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- ⁴⁵⁹ Innis, "Oral", 87.
⁴⁶⁰ Innis, "Oral", 87.
⁴⁶¹ Innis, "Oral", 91-92.
⁴⁶² Innis, "Oral", 91.
⁴⁶³ Innis, "Space", 111. Cited from *The Problem of Knowledge: Philosophy, Science, and History since Hegel*, trans. William H. Woglom and Charles W. Hendel (New Haven: Yale University Press, 1950): 37. See also Tobias Dantzig, *Number, The Language of Science*, 4th ed. (New York: The Macmillan Company, 1967, c. 1930): 9.
⁴⁶⁴ Innis, "Oral", 88.
⁴⁶⁵ Innis, "Oral", 88 fn. 1.
⁴⁶⁶ Harold Innis to W.T. Easterbrook, October 31, 1941, *Harold Adams Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 6.
⁴⁶⁷ Harold Innis to W.T. Easterbrook, April 2, 1943, *Harold Adams Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 6.
⁴⁶⁸ Harold Innis, *The Idea File of Harold Adams Innis*, ed. William Christian (Toronto: University of Toronto Press, 1980): 53.
⁴⁶⁹ Harold Innis, "The Written Tradition and the Roman Empire," in *Empire and Communications* (Oxford: The Clarendon Press, 1950): 110.
⁴⁷⁰ Innis, "Oral", 92.
⁴⁷¹ Innis, "Space", 107.
⁴⁷² Innis, "Space", 107.
⁴⁷³ Innis, "Space", 107.
⁴⁷⁴ Innis, "Oral", 90.
⁴⁷⁵ Innis, "Oral", 90.
⁴⁷⁶ Innis, "Oral", 90.
⁴⁷⁷ Innis, "Oral", 91.
⁴⁷⁸ Innis, "Oral", 96-97.
⁴⁷⁹ Innis, "Oral", 98-100; and "Innis, "Space", 43-44.
⁴⁸⁰ Innis, "Rome", 110, 112-113.
⁴⁸¹ Innis, "Rome", 115.
⁴⁸² Innis, "Rome", 115.
⁴⁸³ Harold Innis, "Review: James Jeans, *Physics and Philosophy*," in *Canadian Geographical Journal*, 27(December 1943): xv; and Innis, "Time", 62.
⁴⁸⁴ Harold Innis, "Egypt", *Empire and Communications* (Oxford, The Clarendon Press, 1950): 13-14; and Innis, "Space", 92-93.
⁴⁸⁵ Innis, "Bias", 34; Innis, "Space", 93-94; and Innis, "Egypt", 16.
⁴⁸⁶ Innis, "Egypt", 14.
⁴⁸⁷ Innis, "Egypt", 16; and Innis, "Bias", 35.
⁴⁸⁸ Innis, "Space", 94-95; and Innis, "Egypt", 17-19.
⁴⁸⁹ Innis, "Egypt", 19-20.
⁴⁹⁰ Innis, "Space", 95.
⁴⁹¹ Innis, "Space", 95-96; and Innis, "Egypt", 22-24.
⁴⁹² Innis, "Egypt", 24.
⁴⁹³ Innis, "Space", 35-36; and Innis, "Egypt", 24-25.

⁴⁹⁴ Innis, "Egypt", 26-27. See also Innis, "Oral", 78. With regard to ancient Israel Innis notes: "Denunciation of images and concentration on the abstract in writing opened the way for advance from blood relationship to universal ethical standards and strengthened the position of the prophets in their opposition to absolute monarchical power. The abhorrence of idolatry of graven images implied a sacred power in writing, observance of the law, and worship of the one true God." See Innis, "Babylonia", 53.

⁴⁹⁵ Innis, "Bias", 36; Innis, "Space", 95-96; and Innis, "Egypt", 24-27.

⁴⁹⁶ Innis, "Egypt", 27.

⁴⁹⁷ Innis, "Egypt", 28.

⁴⁹⁸ Innis, "Babylonia", 44.

⁴⁹⁹ Innis, "Babylonia", 49.

⁵⁰⁰ Innis, "Babylonia", 46, 48, and 52.

⁵⁰¹ Innis, "Babylonia", 49.

⁵⁰² Innis, "Space", 61.

⁵⁰³ Innis, "Time", 67.

⁵⁰⁴ Innis, "Rome", 120.

⁵⁰⁵ Innis, "Rome", 119.

⁵⁰⁶ Innis, "Rome", 129.

⁵⁰⁷ Innis, "Rome", 130.

⁵⁰⁸ Barrington Nevitt, *The Communication Ecology: Re-presentation versus Replica* (Toronto: Butterworth, 1982): 15.

⁵⁰⁹ Harold Innis to W.T. Easterbrook, May 11, 1952, *Harold Adams Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 6.

⁵¹⁰ Innis, "Oral", 9.

⁵¹¹ Innis, "Time", 62.

⁵¹² Innis, "Oral", 70.

⁵¹³ The French philosopher Jacques Derrida, a leading proponent of post-Modernism, has by contrast proclaimed the death of the subject. He argues that the self "is inscribed in language, is a 'function' of language, becomes a speaking subject only by making its speech conform – even in so-called creation, or in so-called transgression – to the system of the rules of language as a system of differences, ..." See Jacques Derrida, "Differance," in *A Derrida Reader: Between the Blinds*, ed. Peggy Kamuf (New York: Columbia University Press, 1991): 67. This section originally appeared in Derrida's *Margins of Philosophy*. trans. Alan Bass (Chicago: University of Chicago Press, 1982). See also Briankle G. Chang, "Deconstructing Communication: Derrida and the (Im)possibility of Communication," in *History of European Ideas*, 9(3): 564; Peter Munz, "How Nietzsche's Ideas about Language Came to be Transformed into Derrida's Ideology of Deconstruction," in *The Australian Journal of Politics and History*, 40(Special Edition): 57-71, 1994; Georg Iggers, *Historiography in the 20th Century* (London: Wesleyan University Press, 1997): 118-133.

⁵¹⁴ William L. Reese, *Dictionary of Philosophy and Religion*, new and enlarged edition (Atlantic Highlands, NJ: Humanities Press, 1996, c. 1980): 680.

⁵¹⁵ Innis, "Introduction", 9.

⁵¹⁶ Juarrero, *Dynamics*, 122-123.

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- ⁵¹⁷ Innis, "Oral", 72.
- ⁵¹⁸ Innis, "Oral", 8-9.
- ⁵¹⁹ Innis' argument is not dissimilar to the effect of software packages noted in Chapter Two, where it was noted that users form systems with their tools, and their behavioral competence is changed by virtue of their interaction with the software.
- ⁵²⁰ Harold Innis, *The Idea File of Harold Adams Innis*, ed. William Christian (Toronto: University of Toronto Press, 1980): 53.
- ⁵²¹ Innis, "Babylonia", 32.
- ⁵²² Innis, "Time", 62. In this case, Innis was too trusting of his sources. His portrayal of Chinese conceptions of time fails to take into account the *I Ching*, or Chinese book of changes which contains a conception of emergent change arising from the opposing forces of *yin* and *yang* which Innis surely would have found congenial. See Reese, *Dictionary of Philosophy and Religion*, 84.
- ⁵²³ Innis, "Babylonia", 32.
- ⁵²⁴ Innis, "Babylonia", 32-33, 40-41, 53-54, and 62.
- ⁵²⁵ Innis, "Oral", 78. See also Innis, "Babylonia", 52-53.
- ⁵²⁶ Ernst Cassirer, *The Problem of Knowledge: Philosophy, Science, and History since Hegel*, trans. William H. Woglom and Charles W. Hendel (New Haven: Yale University Press, 1950): 126-127.
- ⁵²⁷ Harold Innis, *The Idea File of Harold Adams Innis*, ed. William Christian (Toronto: University of Toronto Press, 1980): 190. 24/10.
- ⁵²⁸ Innis, "Minerva", 71; Innis, "Oral", 71. In "The Bias of Communication" Innis places the introduction of writing in the 7th century BC. See Innis, "Bias", 41.
- ⁵²⁹ Innis, "Oral", 71.
- ⁵³⁰ Innis, "Bias", 41.
- ⁵³¹ Innis, "Time", 86.
- ⁵³² Innis, "Minerva", 7-8; and Innis, "Oral", 70.
- ⁵³³ Innis, "Minerva", 9.
- ⁵³⁴ Innis, "Oral", 68.
- ⁵³⁵ Innis, "Oral", 68.
- ⁵³⁶ Innis, "Space", 105.
- ⁵³⁷ Innis, "Oral", 71.
- ⁵³⁸ Innis, "Space", 103.
- ⁵³⁹ Innis, "Oral", 76.
- ⁵⁴⁰ Innis, "Oral", 76-77. Quotes cited from M.P. Nilsson, *A History of Greek Religion* (Oxford, 1925), pp. 179.
- ⁵⁴¹ Harold A. Innis and Jan O.M. Broek, "Geography and Nationalism: A Discussion," in *Geographical Review*, 35(2): 302, April 1945.
- ⁵⁴² Innis, "Space", 102-103, 106.
- ⁵⁴³ Innis, "Space", 61.
- ⁵⁴⁴ Harold Innis, "Preface," in *The Bias of Communication* (Toronto: University of Toronto Press, 1995): xxvii.
- ⁵⁴⁵ Innis, "Introduction", *Empire*, 5.
- ⁵⁴⁶ Innis, "Preface", xxvii.

⁵⁴⁷ Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York: Simon and Schuster, 1992): 177.

⁵⁴⁸ Alicia Juarrero, *Dynamics in Actions: Intentional Behavior as a Complex System* (Cambridge, MA: The MIT Press, 1999): 21-23, 128.

⁵⁴⁹ Juarrero, *Dynamics in Actions*, 152-158.

⁵⁵⁰ W. Brian Arthur, "Positive Feedbacks in the Economy," in *Increasing Returns and Path Dependence in the Economy* (Ann Arbor: The University of Michigan Press, 1994): 2. Also see W. Brian Arthur "Industry Location Patterns and the Importance of History," in *Increasing Returns and Path Dependence in the Economy* (Ann Arbor: The University of Michigan Press, 1994): 49-68.

⁵⁵¹ W. Brian Arthur, "Preface," in *Increasing Returns and Path Dependence in the Economy* (Ann Arbor: The University of Michigan Press, 1994): xii; M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York: Touchstone, 1992): 45-46; Arthur, "Industry Location", 54-55; W. Brian Arthur, "Competing Technologies, Increasing-returns and Lock-in by Historical Events," in *Economic Journal*, 99(1989): 106-131.

⁵⁵² On Marshall and Increasing-Returns see Alfred Marshall, *Principles of Economics*, 8th ed. (London: Macmillan and Co., Ltd, 1920) Book V, Chapter XII: 1-17. [Online] available from <http://www.econlib.org/library/Marshall/marP39.html#Bk.V.Ch.XII>. [September 5, 2001]. On Innis' exposure to Marshall's economics see for example Harold Innis, "Political Economy in the Modern State" in *Political Economy In The Modern State* (Toronto: The Ryerson Press, 1946): 127. Innis' translation of that exposure into an interest in increasing-returns is suggested first by an extract from *Political Economy* in which he states that "the followers of Adam Smith lost the great concept of society as a whole. Ricardo, and the utilitarians destroyed it in the interests of a market economy with its sale of land and labour (Polyani)." See Innis, *Political Economy*, 115. As Kenneth Arrow notes, the revision made by Ricardo and other members of the English school centered on following "the competitive assumptions" of Smith's doctrines "and quietly dropping Smith's boldly-stated proposition that, 'the division of labor is limited by the extent of the market,' division of labor having been shown to lead to increased productivity." The point was important since Smith "put great emphasis on increasing-returns to explain both specialisation and economic growth." See Kenneth J. Arrow, "Foreward", in *Increasing-returns and Path Dependence in the Economy* (Ann Arbor: The University of Michigan Press, 1994): ix-x. As we have seen, Innis laid great stress on Smith's statements regarding the division of labour and the importance of increasing-returns. Arthur Cole corroborated this point in 1959 noting: "The late Professor Harold A. Innis of Toronto used to speak in the most serious terms of the problem of time in economics. . . . Not all economic historians have been as perturbed as Professor Innis, but all quite surely would be happy to contribute to the approach to economics which is not content to consider static or artificially restricted conditions alone. Perhaps it is possible, in fact, to build on certain ideas to be found in Marshall, which in turn hark back to the pre-Ricardian days, and to bring closer together the disciplines of economics and history." See Arthur Cole, *Business Enterprise in its Social Setting* (Cambridge,

MA: Harvard University Press, 1959): 3. With regard to economists' traditional resistance to the concepts of increasing-returns and multiple equilibria see Kenneth J. Arrow, "Foreword", and W. Brian Arthur, "Preface", in *Increasing-returns*, ix-xx.

⁵⁵³ Suzanne Zeller, *Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation* (Toronto: University of Toronto Press, 1987): 4, 185-186, and 273-274.

⁵⁵⁴ Harold Innis, *The Idea File of Harold Adams Innis*, ed. William Christian (Toronto: University of Toronto Press, 1980): 130.

⁵⁵⁵ James L. Larson, *Reason and Experience: The Representation of Natural Order in the work of Carl von Linné* (Berkeley: University of California Press, 1971): 2-3.

⁵⁵⁶ Harold Innis, "The Written Tradition and the Roman Empire," in *Empire and Communications* (Oxford: The Clarendon Press, 1950): 111.

⁵⁵⁷ Innis, *The Idea File*, 249-250. The selection of a 1951 entry into the *Idea File* to interpret Innis' communication studies may strike some readers as questionable since the bulk of the materials comprising both communication studies were written before 1951. This study is proceeding on the assumption that Innis knew and used the indicated material prior to making the entry. There are several reasons for making such an assertion, the first being Innis' intellectual debt to Ernst Cassirer. A. John Watson has documented Innis' substantial use of Cassirer's works, including *The Problem of Knowledge*, for his writings on the subject of time. See A. John Watson, "Marginal Man: Harold Innis' Communication Works in Context." (Doctoral dissertation in political science, University of Toronto, 1981): 518-519. Second, the *Problem of Knowledge* is explicitly cited by Innis in *The Bias of Communication*. See Innis, "Space", 92, n2. Third, Innis' writings in two ways suggest his familiarity with the entry's content prior to 1951. The first is the reference to the emphasis on logic involved in Aristotle's biology. See Innis, "The Written Tradition," 111. The second reference is in the essay "Political Economy In the Modern State", in which Innis argues: "The combination of the mathematical and biological fallacies has been challenged by the insistence that civilization is an art." Here Innis is referring to Kant's rejection of Aristotle's proposal to explain all phenomena in terms of the formal cause that he associated with biology. Kant also rejected Spinoza's insistence that all phenomena should be explained in terms of efficient cause, which he associated with mathematics. Instead, he argued for the autonomy and methodological independence of biology, and suggested that its constructs could not be proven *a priori*, but required continuous interaction with the natural world for confirmation. Kant argued that the process of interacting with purposive organisms in nature resembled art. See Innis, "Political Economy in the Modern State" in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 127. Also see Ernst Cassirer, *The Problem of Knowledge: Philosophy, Science, and History since Hegel*, trans. William H. Woglom and Charles W. Hendel, (New Haven, Yale University Press, 1950): 122-123, 127.

⁵⁵⁸ Cassirer, *Problem of Knowledge*, 124.

⁵⁵⁹ Cassirer, *Problem of Knowledge*, 118-125.

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- ⁵⁶⁰ Cassirer, *Problem of Knowledge*, 118, 125.
- ⁵⁶¹ Cassirer, *Problem of Knowledge*, 122-123.
- ⁵⁶² Cassirer, *Problem of Knowledge*, 120, cited from Kant, *Kritik der Urteilskraft*, ed. K. Rosenkranz, "I. Kants Sämmtliche Werke" (Leipzig, L. Voss, 1838), Teil IV, 65, S. 260.
- ⁵⁶³ Cassirer, *Problem of Knowledge*, 121.
- ⁵⁶⁴ Cassirer, *Problem of Knowledge*, 120.
- ⁵⁶⁵ Cassirer, *Problem of Knowledge*, 121.
- ⁵⁶⁶ Cassirer, *Problem of Knowledge*, 122.
- ⁵⁶⁷ Cassirer, *Problem of Knowledge*, 121-122, 125-126. According to Alicia Juarrero, by emphasising synthetic principles Kant essentially avoided the question of reconciling cause and purpose. In his eyes, the discrepancy represented either a failure of reason or a limitation in human capacity to perceive. It was possible that natural phenomena were governed by principles extending beyond "the sensible," the segment of phenomena humans can perceive, and that resolution could only be reached in the "supersensible", making the project in principle beyond human grasp. Nature may not be susceptible to encapsulation in a single human formulation. See Juarrero, *Dynamics*, 47.
- ⁵⁶⁸ Cassirer, *Problem of Knowledge*, 124.
- ⁵⁶⁹ Cassirer, *Problem of Knowledge*, 124.
- ⁵⁷⁰ Cassirer, *Problem of Knowledge*, 124-125.
- ⁵⁷¹ Cassirer, *Problem of Knowledge*, 125.
- ⁵⁷² Cassirer, *Problem of Knowledge*, 125.
- ⁵⁷³ Cassirer, *Problem of Knowledge*, 126.
- ⁵⁷⁴ Cassirer, *Problem of Knowledge*, 126.
- ⁵⁷⁵ Cassirer, *Problem of Knowledge*, 126-127.
- ⁵⁷⁶ Innis, *The Idea File*, 34.
- ⁵⁷⁷ Innis, *The Idea File*, 51.
- ⁵⁷⁸ Innis, *The Idea File*, 130.
- ⁵⁷⁹ Innis notes: "In each period I have attempted to trace the implications of the media of communication for the character of knowledge and to suggest that a monopoly or an oligopoly of knowledge is built up to the point that equilibrium is disturbed." See Harold Innis, "Minerva's Owl," in *The Bias of Communication* (Toronto: University of Toronto Press, 1995): 3-4. The concept of the oligopoly of knowledge is rarely discussed in the Innis literature.
- ⁵⁸⁰ Easterbrook in his notes wrote: "3. mentioned Kant's categorical imperatives - space and time -- simply accept." I make the assumption here that Easterbrook simply made a mistake in his notation, and that Innis' intent during their conversation was to refer to the Kantian concept of categories. Kant argued that general or pure *a priori* concepts such as space and time were necessary for subjects to synthesize observations into more specific concepts. See W.T. Easterbrook's notes of his July 3, 1952 meeting with Innis, *Easterbrook Papers*, University of Toronto Archives, B75-0030/001.
- ⁵⁸¹ Harold Innis, "Review article: 'Sub Specie Temporis'," in *Canadian Journal of Economics and Political Science* 17 (1951): 553-7.
- ⁵⁸² Innis, *The Idea File*, 102.

⁵⁸³ Franco Ferrarotti, *The End of Conversation: The Impact of Mass Media on Modern Society* (New York: Greenwood Press, 1988): 29.

⁵⁸⁴ Innis, *The Idea File*, 191.

⁵⁸⁵ Innis, "Political Economy", 127-128. With respect to the economics of increasing-returns and the formulation of monopolies Kenneth Arrow notes: "Other analysts in different traditions, especially the French mathematician and economist, A.A. Cournot (1838), saw clearly enough the incompatibility of increasing-returns and perfect competition and developed theories of monopoly and oligopoly to explain the economic system implied by increasing returns."

Arrow, "Foreward," ix.

⁵⁸⁶ Innis, "Time", 88.

⁵⁸⁷ Innis, "Time", 88.

⁵⁸⁸ Innis, *The Idea File*, 102. In his essay "Industrialism and Cultural Values" Innis voiced similar sentiments, noting: "We must all be aware of the extraordinary, perhaps insuperable, difficulty of assessing the quality of a culture of which we are a part or of assessing the quality of a culture of which we are not a part. In using other cultures as mirrors in which we may see our own culture we are affected by the astigma of our own eyesight and the defects of the mirror, with the result that we are apt to see nothing in other cultures but the virtues of our own." See Harold Innis, "Industrialism and Cultural Values", in *The Bias of Communication* (Toronto: University of Toronto Press, 1995): 132.

⁵⁸⁹ Innis, *The Idea File*, 99.

⁵⁹⁰ Innis, "Time", 90.

⁵⁹¹ Innis, "Time", 90.

⁵⁹² Innis, "Time", 64.

⁵⁹³ Harold Innis, "A Critical Review" in *The Bias of Communication* (Toronto: University of Toronto Press, 1995): 191.

⁵⁹⁴ Arrow, "Foreward," ix.

⁵⁹⁵ Innis, "Space", 92.

⁵⁹⁶ As we have seen, the emergence of cultural patterns was due to the "rate of diffusion, conditions of diffusion" of information. For this reason, poetry was referred to as a medium, as was mathematics. See Innis, "Oral", 70, 80. In Greece, only one physical medium was at play during the course of Innis' narrative, namely papyrus. Balance between freedom and constraint was attained by the competition between the oral medium of poetry and the physical medium of papyrus. The tension enabled Greek arts and sciences to thrive in the 4th century B.C. Innis, "Oral", 68-70.

⁵⁹⁷ Innis, *The Idea File*, 34.

⁵⁹⁸ Innis, "Oral", 64.

⁵⁹⁹ Innis, *The Idea File*, 99.

⁶⁰⁰ Innis, "Time", 64.

⁶⁰¹ Innis, "Time", 64.

⁶⁰² Kierstead's acknowledgement of Innis' assistance suggests the latter's familiarity with the work between 1944-1947. See B.S Kierstead, *The Theory of Economic Change* (Toronto: The Macmillan Company of Canada, Ltd, 1948): v, 267.

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- ⁶⁰³ Kierstead, *Economic Change*, 38-49, 253.
- ⁶⁰⁴ Kierstead, *Economic Change*, 24.
- ⁶⁰⁵ Kierstead, *Economic Change*, 28.
- ⁶⁰⁶ Kierstead, *Economic Change*, 26.
- ⁶⁰⁷ Kierstead, *Economic Change*, 38-49, 253; Innis, "Time", 86, 89.
- ⁶⁰⁸ Kierstead, *Economic Change*, 253, fn. 10.
- ⁶⁰⁹ Harold Innis to Arthur Cole, no date (internal evidence in the letter suggests it was written after February 19, 1950), *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ⁶¹⁰ Harold Innis to Arthur Cole, January 9, 1950 and January 20, 1950, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ⁶¹¹ Innis, "Time", 75.
- ⁶¹² Harold Innis, "Idea File. Microfilm copy for private circulation. Preface by S.D. Clark," *Harold Innis Papers*, University of Toronto Archives, B72-0003, Box 14, File 1. Page 159.
- ⁶¹³ Innis, *The Idea File*, 246.
- ⁶¹⁴ Innis, *The Idea File*, 191-192.
- ⁶¹⁵ Harold Innis to Arthur Cole, February 4, 1950, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.
- ⁶¹⁶ Harold Innis to Arthur Cole, February 28, 1950, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1. The primary interest of referring to Innis' February 28 letter to Cole is to document Innis' continued identification of a probabilistic conception of change with the business cycle. While the suggestion that Innis believed government relied primarily on the method of comparative statics to make predictions of market behaviour neither adds nor detracts from the central argument, it nevertheless requires justification. Innis' point regarding the distinction in orientation and method between government and business is more implicit than explicit in his letter to Cole. The interpretation is based on a reading of the relevant paragraph in conjunction with extracts from *The Idea File* and "A Plea for Time". Here is the paragraph from Innis' letter to Cole:

I noted that your next paragraph to some extent covers the point. An appreciation of the extent to which large organizations have faced and dealt intelligently with the continuity or time problem will enable one to see more clearly the problems of that segment of society which has never considered the problem of continuity and has been essentially transient. It would be interesting to know how far insurance companies feel they can go in using mathematics to forecast the future. To some extent, the superiority of government in the time field has given it an enormous advantage and I suspect this explains the trend toward increased government intervention, so long as private enterprise leaves the

field neglected governments will rush to fill the vacuum. (Harold Innis to Arthur Cole, February 28, 1950, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.)

The paragraph on its own suggests an opposition between business and government, insofar as Innis suggests an opposition of temporally aware organisations with temporally unaware organisations to facilitate understanding of the latter. The subsequent reference to insurance companies and government can be interpreted as a concrete example of this opposition, especially given the dichotomy of interest between the two suggested in the last sentence. But Innis' reference to the "superiority of government in the time field" renders his meaning ambiguous. Is he suggesting the government is also resorting to probability theory to facilitate economic forecasting, or is he simply stating that the government is the predominant player in the practice of economic forecasting?

The latter interpretation is suggested by two entries Innis made into *The Idea File*. The first suggests that Innis construed resort to a probabilistic conception of time as one sign of a society successfully managing the quantity of information in circulation. Such societies extrapolated future trends from past events:

News -- essentially concerns happenings in the past and serves as information as to happenings in the future. Improved communication hastens information and facilitates action after information recorded i.e. stock exchange. Constant search of past for guidance of action in future -- possibility of steadying news with increased emphasis on immediate through interpretation, editorial policy and the like. Inevitable that sustained studies of past tend to diverge from immediate demands of present -- Gap tends to widen with improved communication -- log in relation between demand for immediate news and sustained studies. (Harold Innis, "Idea File. Microfilm copy for private circulation. Preface by S.D. Clark," *Harold Innis Papers*, University of Toronto Archives, B72-0003, Box 14, File 1. Page 149.)

As we saw in *Political Economy in the Modern State* Innis believed that during the 19th century the rising quantity of information undermined the influence of business and other temporal institutions, in part because inhabitants could not discern patterns in the ever larger amounts of data they were exposed too. Hence, their stance -- be it in culture, be it in politics -- became reactive, and

the only ideology that retained any force was nationalism. The state became the beneficiary of popular allegiance. In *The Idea File* Innis suggests the state was also pushed to maintain a purely reactive stance to the market due to improvements in communication:

INTEREST RATES -- Business fluctuations result of increase or decrease of intensity in belief in possibility of predicting the future -- influence of communication. System of interest rates mathematically impossible -- with increasing rigidity due to influence of publicity and communication inevitable pressure to lower rates of interest. Contracts or treaties between nations incapable of permanence and necessity of system providing for constant change in constitutional set-up. Political machinery build around interest rates and necessity of resorting to monetary manipulation. (Harold Innis, "Idea File. Microfilm copy for private circulation. Preface by S.D. Clark," *Harold Innis Papers*, University of Toronto Archives, B72-0003, Box 14, File 1. Page 159.)

Read in light of the previous entry into *The Idea File*, Innis seems to be suggesting that improvements in the rapidity and quantity of information circulation heightened the difficulty in undertaking studies of long-term economic trends, since the rapidity of economic change made short-term considerations the more pressing, and undercut the belief that long-term trends could be brought under analytical control. Hence, communication technology had a direct bearing on the intensity of policymaker's "belief in possibility of predicting the future" and in actuality made such an enterprise impossible since the data was not to be had: "System of rates mathematically impossible." For policymakers, then, there was little choice but to create institutional machinery that was reactive, in part because in the absence of market data, and the west's increasingly ingrained habit of interpreting the market from the perspective of the present, policymakers faced political pressure to view the economy as an instrument to be manipulated: "with increasing rigidity due to influence of publicity and communication inevitable pressure to lower rates of interest." The state, accordingly, had to be constructed in such a way that it was prepared for "constance change." Political or bureaucratic machinery was set up to manipulate interest rates, and analytical tools were employed that met its political and economic needs. Hence, in "A Plea for Time" Innis seems to be suggesting the state resorted to comparative statics. The trend was not to be celebrated, but for the purposes of the Time Horizons project it did need to be understood, and compared with businesses that made predictions using assumptions that were justifiable:

The need for a sane and balanced approach to the problem of time in the control of monopolies, and in the whole field of interest theory and in other directions, is evident in the growth of a bureaucracy in a totalitarian state. The static approach to economic theory has been of limited assistance in meeting the problem of time. (Innis, "A Plea for Time", 75.)

⁶¹⁷ Harold Innis to Arthur Cole, April 24, 1950, *Harold Innis Papers*, University of Toronto Archives, B72-0025, Box 11, File 1.

⁶¹⁸ Innis, "Roman Empire", 111.

⁶¹⁹ Kierstead, *Economic Change*, 22.

⁶²⁰ Innis, "Introduction", *Empire*, 12-13.

Conclusion:

⁶²¹ Harold Innis, "An Introduction to the Economic History of the Maritimes, Including Newfoundland, and New England," in *Essays in Canadian Economic History*, ed. Mary Q. Innis (Toronto: University of Toronto Press, 1962, c. 1956): 42.

⁶²² Ernst Cassirer, *The Problem of Knowledge: Philosophy, Science, and History since Hegel*, trans. William H. Woglom and Charles W. Hendel (New Haven: Yale University Press, 1950): 126-127.

⁶²³ Cassirer, *Problem of Knowledge*, 126-127.

⁶²⁴ Innis, *The Idea File of Harold Adams Innis*, ed. William Christian (Toronto: University of Toronto Press, 1980): 102.

⁶²⁵ Harold Innis, "The Written Tradition and the Roman Empire," in *Empire and Communications* (Oxford: The Clarendon Press, 1950): 111.

⁶²⁶ Judith Stamps, *Unthinking Modernity: Innis, McLuhan, and the Frankfurt School* (Montreal and Kingston: McGill-Queen's, 1995): xii-xiii.

⁶²⁷ Gary Saul Morson, *Narrative and Freedom: The Shadows of Time* (New Haven: Yale University Press, 1994): 4-5.

⁶²⁸ Mikhail Bakhtin, "Forms of Time and of the Chronotope in the Novel: Notes Towards a Historical Poetics," in *The Dialogic Imagination: Four Essays by M.M. Bakhtin*, ed. Michael Holquist, trans. Caryl Emerson and Michael Holquist (Austin and London: University of Texas Press, 1981): 84.

⁶²⁹ Donald Davis, "The 'Metropolitan Thesis' and the Writing of Canadian Urban History," in *Urban History Review* 14(2): 103-105.

⁶³⁰ See Harold Innis, "Political Economy in the Modern State," in *Political Economy in the Modern State* (Toronto: The Ryerson Press, 1946): 135-137.

⁶³¹ Holland notes: "Competition and cooperation may seem antithetical but at some very deep level, they are two sides of the same coin." See H. Mitchell

Waldrop, *Complexity: The Emerging Science At the Edge of Order and Chaos* (New York: A Touchstone Book, 1992): 185.

⁶³² See Ian Angus and Brian Shoesmith, "Dependency/space/policy: an introduction to a dialogue with Harold Innis." in *Continuum: The Australian Journal of Media and Culture*. 7(1) 1993. Available On-line: <http://wwwmcc.murdoch.edu.au/ReadingRoom/7.1/Angus&S.html>. [June 18, 2001]; Trevor Barnes, "Focus: A Geographical Appreciation of Harold Innis," in *The Canadian Geographer*, 37 (4): 352-53, 1993; William J. Buxton, "Harold Innis' Excavation of Modernity: The Newspaper Industry, Communications, and the Decline of Public Life," in *Canadian Journal of Communication*, 23(2) 1998. Available On-line: <http://www.cjc-online.ca/~cjc/BackIssues/23.3/buxton.art.html>. [June 18, 2001]; Edward Comor, "Harold Innis's Dialectical Triad," in *Journal of Canadian Studies*, 29(2): 111-127. Spring 1994.

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