

# **Evolutionary Psychology, Complexity Theory and Evolution of Social and Legal Rules**

Hilary Fisher BA LLB (Hons I)

A thesis submitted for the degree of Doctor of Philosophy at the University of Queensland in April 2006.

## Abstract

Evolutionary theories accounting for legal emergence offer important insights to add to orthodox jurisprudential debate. It is proposed that the nature of law can be more satisfactorily or comprehensively appreciated by incorporating an evolutionary perspective. This thesis uses the generic variation-selection-retention paradigm of Donald T Campbell as the conceptual framework for considering how the biological and cultural evolutionary processes add these valuable insights into the nature of the law. FA Hayek approved and adopted Campbell's model to produce the thesis on legal evolution that is the subject of his works *The Constitution of Liberty* and *Law Legislation and Liberty*. Hayek's thesis is considered to be the most sophisticated and comprehensive analysis of the application of evolutionary theory to legal development. By investigating recent advances in the scientific disciplines of complex systems theory, evolutionary psychology and theories of cultural evolution in the context of a Hayekian-Campbellian framework this thesis aims to augment, consolidate and complement these early important works.

This thesis updates Hayek's examination of society as a production of self-organised and spontaneously ordering behaviour by examining the growing literature applying the non-linear sciences of complexity theory and chaos theory to legal philosophy. Rules are a product of innate rule-following behaviour or attempts by people to coerce others into rule-abiding conduct. Many of these behaviours are explicable on a biologically-derived evolutionary basis or as an interplay of genetic predispositions with the cultural evolutionary process. Evolutionary psychology as a scientific rationale for human behaviours contributes significantly to an understanding of legally relevant behaviour in terms of genetic traits that have evolved to solve the adaptive challenges of the social environment. Rules and laws are items of cultural inheritance the survival of which may be understood in terms of cultural evolution or memetic theory. Explaining both biological traits and cultural products as the product of selectors at various levels of a nested hierarchy of vicarious selectors can reveal insights into the process of legal emergence. These insights may also inform questions of the usefulness and feasibility of different laws and legal approaches as well as providing a factual basis for a discussion of normative considerations.

## Chapter 1 - Introduction

‘Nothing is permanent except change.’ Heraclitus (c 535 – c 475 BC)

### 1.1 Background

The ancient Greek philosopher Heraclitus recognised the ubiquity of change over two thousand years ago. Law and legal systems, like all other human culture and institutions, are far from immune from this phenomenon. However, theories explicitly accounting for legal emergence have played a less important role in orthodox jurisprudential debate than those that attempt to classify the law and prescribe particular behaviours. This thesis adds to this orthodox debate by exploring and highlighting the importance of theories on legal emergence.

The lack of specific focus on legal emergence is perhaps surprising, as human beings are naturally curious animals. It is the nature of humans to try to understand and explain their environment. Theoretical explanations of observed phenomena are evident in the history of many cultures. Explanatory stories subsist in the form of mythology and religion. Science adds a systematic element to the accumulation and interpretation of knowledge.<sup>1</sup>

Human fascination with understanding is particularly intense when it comes to examining the human race itself. We theorise about our condition and nature, interpret and reinterpret our past, collect relics of our history and dig up the rubbish and graves of our ancestors in an attempt to understand ourselves. Law is a fundamental part of any human society. The earliest known recorded laws are from Mesopotamia and date from around 2350 BC,<sup>2</sup> but some type of regulation in social behaviour must have been present for as long as hominids have been group-living species. Reflections on the nature of law were well-developed by the time of the ancient Greeks, such as Heraclitus. No doubt *Homo sapiens's* proclivity for introspection produced speculation on the nature of rules long before this. Human history is replete with attempts to analyse, categorise, moralise and proscribe about law.

### 1.2 Jurisprudential background

Current legal philosophy rests on a lengthy and prestigious history. The two greatest legal philosophies are the contrasting theories of positivists and natural lawyers. It is not the task of this thesis to critique these schools of jurisprudential thought. However, it is worth briefly noting some of the general advantages an evolutionary approach can offer to legal theory on issues that are not the primary concern of the more traditional philosophies.

The main concern of positivism is definitional: what constitutes a valid law. Positivism is typically based on the assumption that all objective criteria of legality must be positive; that it is possible to reduce all rules to logically derived premises. To be ‘real’ law in the eyes of a positivist the law must be deliberately made or

---

<sup>1</sup> Religion and science have both fed humanity’s need for answers. Religion, particularly, has served this purpose for much of human history.

<sup>2</sup> The earliest known code is Urkagina’s Code of c 2350 BC. No copy of this has been unearthed, but reference is made to it in later laws. The earliest written laws are in Ur-Nammu’s Code of c 2050 BC. Hammurabi’s famous code of nearly 300 laws inscribed on a eight-foot high stone pillar dates from about 300 years after this (Rodgers 1993, 33).

posited.<sup>3</sup> Positivism also rejects moral values as a consideration for legal validity. This is a self-imposed limitation of positivism in its endeavour to resolve questions about the formal validity of law. It does not focus on the question of the ultimate origins of the rules for which these questions of validity arise; or on issues regarding the factual existence of other rules or rule-following behaviour in social life. An evolutionary perspective reveals insights into these questions. Evolutionary jurisprudence sources the origins of law in culture and biology and posits that the ultimate origin of all laws is non-positive in nature. These original rules are not necessarily derived from any legitimate source, nor are they necessarily the product of human will. Such a conceptual and historical approach to the exegesis of laws reveals that the existence and nature of law is inseparable from the factual matrix in which it evolved (1982a, 44, 45, 50, 52; Hayek 1982b, 174).

Similarly to positivism, natural law theories employ a top-down and absolutist approach to the consideration of laws. Originally, many natural law theories proposed that higher moral laws were sourced on religious grounds. Such laws were inviolable by any positive enactments. This understanding of law springs from a teleological perspective, that there is a purpose to the 'natural order', human existence and hence human law, which should therefore accord with this natural order.<sup>4</sup> More recent attempts to establish a theory of natural law have done so on non-religious grounds, aiming to derive self-evident values, from which normative conclusions can be made as to the desirability of particular laws. This is the principal purpose of modern natural law theory. Like positivism, natural law theory tends not to address questions as to the origin of law, but it aims to provide a means for making normative judgments about it. It also, in some circumstances, seeks to challenge the sole use of positivist criteria for determining the validity of law.<sup>5</sup>

However, neither of these approaches devotes its principal attention to the process of emergence of rule-following behaviour, social norms and legal rules. This thesis proposes that evolutionary theory has the greatest explanatory value for answering these questions.

### ***1.3 Research aims***

The principal aim of this thesis is to show that the orthodox discourse is significantly improved by adding the voice of evolutionary theory on the issue of legal emergence. In achieving this aim, subsidiary aims are encompassed.

#### **This thesis addresses the following issues:**

An evolutionary model is employed to explain legal emergence, to reveal further insights into mainstream jurisprudence and to establish the proposition that an evolutionary perspective adds a valuable layer to appreciating the nature of law.

Evolutionary theories of law neither consider laws to be an abstraction of a rational mind, a conscious human creation, or immutable absolute values. As a specific application of the theories of biological and cultural evolution, they have explanatory

---

<sup>3</sup> Principal theorists in this area include HLA Hart, Neil McCormick, Hans Kelsen and Joseph Raz.

<sup>4</sup> Such an approach is susceptible to the charge of falling foul of the normative fallacy if it derives normative conclusions from observed factual values. The normative fallacy is considered further in

**Chapter 8**

<sup>5</sup> For a consideration of modern natural law theory see John Finnis and Lon Fuller.

power for the aetiology of laws and rule-following behaviour. Whilst acknowledging the post-modernist insight into the perceptual limitations on ultimately validating any knowledge, evolutionary explanations have the advantage of testability and falsifiability to the same extent as any other scientific doctrine. The evolutionary process itself is one of selection or ‘falsification’ by the environment. Human explanatory efforts, including those in relation to evolutionary theory itself, are liable to refutation or falsification by the ‘discovery’ of better explanations (Ratnapala 1996, 88, 109). They have the potential to explain the historical development of law as a scientific process.

1. This thesis aims to demonstrate that a comprehensive conceptual framework explaining the spontaneous emergence of rules can be achieved by combining the Donald T Campbell variation-selection-retention paradigm with the thesis of FA Hayek.

The evolutionary approach per se is not a novel one and theorists over the centuries have employed various evolutionary or quasi-evolutionary methodologies to explain, predict, justify or criticise legal change. Friedrich August von Hayek’s account is the most comprehensive and sophisticated theory of evolutionary jurisprudence. For this reason, his scientific thesis is used as the foundation for the further consideration of evolutionary jurisprudence in this thesis. Hayek approved and adopted the generic model of evolutionary theory set out by Campbell. Campbell’s insight that all evolutionary change is a process of knowledge accumulation explicable by the trifold process of the selected retention of adaptive variations, through a nested hierarchy of vicarious selectors is used as the model for all of the relevant evolutionary processes, biological and cultural, analysed in this thesis.

Since Hayek and Campbell devised their theories, there have been developments in the understanding of the scientific evolutionary process, in particular in the areas of complex systems theory, evolutionary psychology and theories explaining the cultural evolutionary process. Using Hayek’s and Campbell’s approaches as the basis, this thesis examines the advances in knowledge in these three areas and the implications of these developments for legal philosophy.

2. The thesis consolidates the growing, but unfocussed literature emerging that applies non-linear science, complexity theory and chaos theory to legal philosophy and in doing so clarifies some of the challenging issues that arise from their application.

An increasing number of authors are recognising the benefits that the insights of non-linear science have to offer legal theory. Although it seems that these authors are aware of each other, there has been little work done to integrate the research done so far. An additional gap in the theories in this field is that no one has attempted to comprehensively consolidate the theoretical advances in complex systems science with the social science theory of self-organisation. Theories of self-organisation in human society were first proposed in the eighteenth century. They have been comprehensively applied to legal theory by Hayek.

3. The thesis tests the Hayekian account of the self-organised emergence of spontaneously ordered human communities in the light of discoveries benefits and insights gained in mathematics and non-linear science.

Analyses of social organisation as the product of the human condition and behaviour have always been more problematical and less susceptible to the rigors of scientific analysis than the physical sciences. However, these recent advances in systems theory and the non-linear sciences of complexity offer promise for introducing a more principled and systematic analysis to the study of social organisation. Evolutionary psychology provides a theoretical basis for research into human behaviour.

4. This thesis examines the extent to which evolutionary psychology as a scientific rationale for human behaviours contributes to an understanding of legally related and in particular rule-following behaviour and this behaviour is an essential basis for the emergence of rules and legal systems.

It is suggested that most rules are either the product of innate rule-following behaviour or attempts by people to coerce others into such rule-abiding conduct. Many of these behaviours are explicable on a biologically derived evolutionary basis. The other aspects of these behaviours are referable to the cultural evolutionary process. Rules and laws are items of retained culture. As such, they are susceptible to the vagaries of the cultural evolutionary process.

5. This thesis develops a clearer account of law, as a form of culture that emerges by the process of cultural evolution through the selected retention of rules at various levels of the nested hierarchy of selectors.

Isolating the separate components of the biological and cultural evolutionary processes is no easy task. Most considerations of evolved culture are intertwined with discussions of evolved psychology. However, there are distinct selective processes involved, as well as separate methods of retention and transmission. The Campbellian generic framework is employed to explain these processes in the context of legal emergence.

6. This thesis inquires about the extent to which the insights gained from the consideration of these fields assist in evaluating laws and legal methodologies and clarify normative options in social and legal policy.

## ***1.4 Research approach and methodology***

### **1.4.1 Research approach**

The research approach is necessarily cross-disciplinary. It aims to be principally positive and objective. Therefore, although the nature of the topic has unavoidably doctrinal overtones, the approach will be predominantly critical rationalistic. The focus is descriptive rather than prescriptive, but some normative considerations will be addressed in **Chapter 8**. Like Hayek, this thesis aims to be as factually based and unemotional as is possible at the risk of being mundane or pedestrian (Hayek 1960, 7). As far as this is feasible the aim is for detached scientific intellectual concern.

The concept of law in this thesis will be considered broadly to encompass all normative rules regulating the behaviour of members of society. An inductive

approach is favoured over deductive methodology for analysis of these laws and the evolutionary considerations governing their emergence and change. Therefore the method adopted here is both analytical and theoretical.

### **1.4.2 Research methodology**

This thesis is based on the primary research of experts in the scientific fields examined, including complexity theory, evolutionary biology, (especially evolutionary psychology and anthropology) and theories of cultural evolution, as well as analysis of the theoretical contributions of others in these fields. Particular attention is given to authors who combine consideration of these developing areas with legal theory. A critical rationalistic approach is employed to analyse this research.

### **1.4.3 Other caveats**

Although the process of legal emergence and change is considered in a general sense in this thesis, most examples used focus on the common law system of English derived societies. This is due to the author's familiarity with this variety of law. The aim of the thesis is not to overview particular laws, but will use selected examples as justification or demonstration of the methodology of legal emergence proposed.

Also, whilst the extensive literature on economics and the law is acknowledged, it is beyond the scope of this thesis to survey the material in this area. The focus is on the biological and socio-cultural literature that relates to law (Gibson 1992, 123).

## **1.5 Literature review**

Consideration of the combined influence of the above-mentioned developments has received little attention until the last decade. There is no particular area of literature that considers all of these disciplines and their specific application to law. However, there is a small and growing literature on the relevance to legal theory of complex systems theory and evolutionary psychology.

A number of theorists over the centuries have purported to apply an evolutionary analysis to legal phenomena. Certainly after Charles Darwin's contribution to evolutionary biology achieved wide circulation, a number of accounts of legal emergence were produced by analogy with the Darwinian natural selection process. The limitation of many of these works is that they argue by analogy from a biological evolutionary process, whereas the selective-retention paradigm has general application. Biological evolution is only one example of this process. In fact, in the century prior to Darwin, significant evolutionary tracts which deal with the cultural evolutionary process can be found in the works of the eighteenth century evolutionary theorists such as David Hume, Adam Ferguson, Bernard Mandeville and Adam Smith. The intellectual debt biological evolution owes to these thinkers is frequently overlooked.<sup>6</sup>

The second limitation of some of the works taking an evolutionary approach to legal theory is that the evolutionary perspective taken is not a true scientific one. In this sense, the word 'evolution' is used as simply another term for change.

---

<sup>6</sup> Interestingly, Darwin himself was well aware of this literature. For a detailed consideration of the eighteenth century evolutionary theorists see S Ratnapala, 'Eighteenth-Century Evolutionary Thought and its Relevance in the Age of Legislation' (2001).

The most significant scientific thesis on the evolutionary process of legal development was written by FA Hayek. This is principally set out in two of his works: *The Constitution of Liberty*, published in 1960 and the three volume text, *Law Legislation and Liberty* published between 1973 and 1979. These works demonstrate that Hayek was a harbinger of the later developments in complex systems theory and other evolutionarily relevant science. They are the pinnacle of ‘pre-modern’ scientific evolutionary theories of law. His early insights into spontaneous order and evolutionary theory as applied to jurisprudence will be used as a framework. In particular, this thesis draws on his notion of the spontaneous ordering of society.

There is a small but growing literature on the implications of evolutionary psychology and complexity theory for law. Although treatments of chaos or complexity with law-related subject matter now number in the dozens, little work has been done comparing or attempting to reconcile these approaches. These reports often pay lip-service to the relevance of the developments in other evolutionarily-relevant fields, but as of yet, no work seems to have summarised and collectively considered the implications of the separate theorisings.

For this reason, the literature considered in this thesis encompasses both literature specifically considering the applications of these fields to law and some of the original work in the fields of evolutionary psychology, complex systems theory and cultural evolutionary theory.

A number of authors are starting to consider the potential applicability of the sciences of complexity theory and chaos theory to legal systems. As yet, no books have been written specifically on this topic, but there is a burgeoning field of journal articles taking different perspectives on these issues.

Likewise, evolutionary psychology; although some books on this field are beginning to be published, most notably Margaret Gruter’s work: *Law and the Mind: Biological Origins of Human Behavior*. Margaret Gruter is also responsible for setting up the *Gruter Institute for Law and Behavioral Research* which pursues multidisciplinary research in the law and biological behavioural sciences. Also, *SEAL* or the *Society for Evolutionary Analysis in Law*, established by Owen Jones, conducts research spanning the intersection between legal theory and practice and biology and evolution as well as conducting complex adaptive systems research.

It is difficult, if not impossible, to separate works relating to cultural evolution from considerations on biological evolution as there is a large overlapping of issues. The cultural evolutionary theory specifically relied upon in this thesis is the work of Donald T Campbell. Many others have addressed this field including Luigi Cavalli-Sforza, Robert Boyd and Peter Richerson.

This thesis consolidates the findings of these disparate fields, overviews their contributions and analyses them to the extent that they are relevant to legal emergence.

### ***1.6 Contribution of the Chapters to this thesis***

In order to refocus orthodox debate and fully appreciate the insights evolutionary theory offers, this thesis first explains the basic principles of evolutionary theory, in

particular from a Campbellian perspective before explaining the foundational theory of Hayek. The later chapters explore the disparate, but related, fields of non-linear science and biological and cultural evolutionary theory before applying them to law. The following explains in more detail the work of each chapter.

**Chapter 2** explains evolutionary theory, both in the generic sense adopted in this thesis and in the specific fashion employed by biological evolution, cultural evolution and epistemological evolution, leading to the specific focus on evolutionary theories of law considered in later chapters. Importantly, the generic variation-selection-retention paradigm of Campbell is explained, which is used as the foundation for all evolutionary analysis in this thesis.

The most sophisticated and comprehensive contemporary analysis of the application of evolutionary theory to legal development can be found in the works of Friedrich August von Hayek. Hayek (1899-1992) is the most eminent of the modern Austrian economists. He was awarded the Nobel Memorial Prize in Economic Science in 1974 for his work in this area. His best known work is *The Road to Serfdom*, published in 1944. However, Hayek also produced a number of works of legal theory, and his comprehensive account of legal emergence is arguably still the most complete and insightful explanation of this phenomenon. Hayek combines insights into evolutionary theory and the foundation of spontaneous orders with the emergence of social and eventually legal rules. This scientific thesis is considered in detail in **Chapter 3**.

The insights of Hayek are now susceptible to further scientific support in the light of developments in the theories of spontaneous order. The modern field is the non-linear science of complex systems theory, most pertinently chaos theory and complexity theory. In addition, developments in evolutionary biology, in particular evolutionary psychology, have advanced research on these matters. However, very few of the authors in these burgeoning fields acknowledge the sophisticated analysis of Hayek on the topic of legal emergence. This thesis aims to redress this.

**Chapter 4** examines the most recent developments in the analysis of spontaneous orders. The sciences of complexity theory and chaos theory have introduced rigour to the consideration of the notions of complex adaptive systems and spontaneous order. The application of these principles to cultural systems and social change is very much in its infancy; the applications to legal theory are even more tentative and embryonic. However, there is a growing appreciation of the insights complex system theory offers in the understanding of the fundamental working of social and legal systems.

**Chapter 5** analyses some of the insights from the works considered in **Chapter 4** and specifically relates this theory to the work of Hayek. The chapter outlines a theory for understanding legal order in terms of the language of non-linear science.

It is often overlooked that human law is a production of, as well as an influence on, human behaviour, whether such laws be unconscious or a deliberate creation. Evolved psychological dispositions are essential to rule formation. Human behaviour is the product of the interplay of biological, cultural and external environmental factors. Each of these factors is also subject to evolutionary development. Neurophysiology has only scratched the surface in its understanding of brain function. However, evolutionary psychology is developing evolutionary explanations for human

behaviour based on the likely function of identifiable behavioural attributes.<sup>7</sup> **Chapter 6** investigates some of the current findings of evolutionary psychology and their implications for legal theory and legal emergence.

Although humans are born equipped with or have the potential to develop certain behavioural dispositions, complex interactions with other humans and the non-human environment play an important part in determining the behaviour of individuals and groups. Culture itself is probably the most important part of the environment of *Homo sapiens*. Law is a specialised type of culture and, in the language of memetics, rules can be described as memes. **Chapter 7** uses the Campbellian evolutionary framework to explain the principles of cultural evolution as they relate to law.

**Chapters 1 to 7** are expository in tone and do not address normative considerations. **Chapter 8** deals briefly with these issues. It addresses the normative aspects of Hayek's theory as well as other normative considerations raised by the discussion in the previous chapters.

**Chapter 9** offers some concluding thoughts on the issues discussed in the other chapters. It also makes suggestions as to directions for further research which would benefit this field.

Geneticist Theodosius Dobzhansky famously asserted that, 'Nothing in biology makes sense except in the light of evolution' (Colby 1996, 23). The essence of this thesis is that the same could be said for law.

---

<sup>7</sup> Further reduction to neurophysiological mechanisms will likely be possible in time, or at least offer a greater understanding of the complex interactions that constitute the workings of the brain.

## Bibliography

- Colby, Chris (1996) Introduction to Evolutionary Biology. URL  
[http://www.clark.net/pub/ogas/evolution/GUIDE\\_intro\\_to\\_ev\\_biology.htm](http://www.clark.net/pub/ogas/evolution/GUIDE_intro_to_ev_biology.htm)
- Gibson, Suzanne (1992) Law Representing Life -- Reflections on Darwinian Jurisprudence. *Law and Critique*, 3, 99
- Hayek, Friedrich August (1960) *The Constitution of Liberty*. University of Chicago Press, Chicago.
- Hayek, Friedrich August (1982a) *Law, Legislation and Liberty: A New Statement of the Liberal Principles of Justice and Political Economy: The Mirage of Social Justice*. Routledge and Kegan Paul, London.
- Hayek, Friedrich August (1982b) *Law, Legislation and Liberty: A New Statement of the Liberal Principles of Justice and Political Economy: The Political Order of a Free People*. Routledge and Kegan Paul, London.
- Ratnapala, Suri (1996) Law as a Knowledge Process. In: *Jurisprudence of Liberty* (eds. Ratnapala Suri & Moens Gabriël A). Butterworths
- Ratnapala, Suri (2001) Eighteenth-Century Evolutionary Thought and its Relevance in the Age of Legislation. *Constitutional Political Economy*, 12, 53-77
- Rodgers, William H, Jr (1993) Where Environmental Law and Biology Meet: Of Pandas' Thumbs, Statutory Sleepers, and Effective Law. *University of Colorado Law Review*, 65, 25, 46-48