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Law, Ethics, and Complexity: Complexity Theory & (and) the Normative Reconstruction of Law

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LAW, ETHICS, AND COMPLEXITY: COMPLEXITY THEORY & THE NORMATIVE RECONSTRUCTION OF LAW

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I. INTRODUCTION

The tension between law as an instrument of oppression and of emancipation has been widely discussed and documented within various branches of 'critical' legal theory. At the root of the critical concern lies a deepening understanding of law's capacity to resist and absorb resistance, while at the same time expanding to juridify an ever-broadening range of social relations. Paradoxically almost, the very ubiquity of law highlights its emancipatory failure in modern society.[2] In this paper I will suggest (albeit in a preliminary fashion) that, by developing a fuller understanding of what it means to say that law is a *complex system*, we can create new strategies for the normative reconstruction of law.[3] By using the term "normative reconstruction"

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[2]*See* BOAVENTURA DE SOUSA SANTOS, TOWARD A NEW LEGAL COMMON SENSE 1-2 (2d ed., 2002).

[3]My point is not that complexity theory of itself necessarily has a normative dimension; indeed, "autopoietic" theory – a significant branch of complexity theory – specifically adopts a descriptive approach to phenomena, which seems inconsistent with any larger normative aim. This is not necessarily a criticism. Description is an important preliminary to normative reconstruction – we first need to *understand* the phenomena we are dealing with. Hence, my point is that reconstruction only becomes a "meaningful" process once we acknowledge the problematics created by law's complexity. My colleague, John Paterson, uses the metaphor of "mapping" to describe the value of autopoietically derived research: "a map is a representation of reality involving inevitable reductions, simplifications and omissions. One cannot really ask whether a map is right or wrong … one can simply ask whether it is useful. [Autopoiesis] offers the possibility for drawing a different map of social reality, one which it claims is more adequately complex. Others must judge whether that map is useful as they move forward to

my intention is to signal that this paper is an attempt to move beyond the 'negative critique' that characterized much early critical - or more specifically Critical - theorising about law and legal institutions, specifically by using the postmodern (re-)awakening to the ethical as a basis for re-imagining law's values, relationships and institutional settings.[4]

My intention in this paper is a modest one, and a preliminary to more detailed analysis of the relevance of complexity theory to law. Accordingly, this paper presents an argument in three phases: it looks first at the nature of complexity and the philosophical grounds which, I suggest, inform a social theory of complexity; second, it ascribes characteristics which can be seen as constitutive of complexity, and applies those to the field of law, before looking (third) at how an acknowledgment of complexity can assist us in the process of normative reconstruction.

II. THE NATURE OF COMPLEXITY (THEORY)

To talk of law as "complex" seems, at first sight to be no more than an unhelpful truism, but complexity, I suggest, is a useful corrective to the more simplistic and positivistic traditions which see the law as a complicated but ultimately rational, predictable and linear-hierarchical enterprise. To be sure law (or perhaps, more accurately, some elements of law) may appear rational, predictable and linear at times, but systemically, the law as a whole exhibits many features which are non-linear and recursive, unpredictable and subject to the whim of competing rationalities. In short, law displays many of the classic features of what complexity theorists call 'complex adaptive systems'. Such complex systems are, unsurprisingly, difficult to define in the abstract, and, indeed, there is no single accepted definition of a complex system. At its simplest (if we allow that a simple definition of complexity is not a total oxymoron[5]), it is possible to say that they behave and

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effect social transformation." (Personal e-mail communication on file with the author). *See also* John Paterson & Gunther Teubner, *Changing Maps: Empirical Legal Autopoiesis,* 7 SOCIAL & LEGAL STUDIES 451 (1998).

[4]The phrase is originally Nicola Lacey's, *Normative Reconstruction in Socio-Legal Theory*, 5 SOCIAL & LEGAL STUDIES 131 (1996). I have adopted it here to acknowledge with her not just the antinomy between deconstruction and reconstruction, but also the useful ambiguity within the term itself, implying as it does both a re-building and a re-interpretation of law's normativity.

[5]The act of definition uncovers the same features that complexity theory identifies and problematises and hence in turn problematises the very idea of a definition of complexity; in short, we risk becoming locked within a self-referential complexity of complexity –

> Even here while I am attempting to examine models of complexity, I find myself talking of such models themselves as emerging, evolving, mutating and becoming feedback mechanisms....
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> So, my meta-meta models explain meta-modelling in terms of features associated with complexity science, which is the model I'm supposed to be investigating in the first place! This then cannot be the starting place as I have already contaminated and ordered the data. This goes beyond the problem of self-reference to become a problem of self-ontologising.

Paul Haynes, 'Bifurcation II' in Will Medd & Paul Haynes, *Complexity and the Social,* paper presented to the Centre for Social Theory & Technology/Economic & Social Research

develop according to three key principles.[6] First, "order" is an emergent property of the interactions within a system rather than predetermined by design. Secondly, the system's history is an important and irreversible determinant of its structure *and* a history that can never be re-created because it is constantly being reconstituted by self-organizing processes in the system.[7] Third, the future development of the system is often unpredictable. This provides, broadly speaking, an adequate starting point, but it does not tell us enough about either the mechanics or the epistemological assumptions which underpin complexity.

Complexity theory has its earliest origins in studies of self-organization within genetic and other biological systems, and in parallel developments in the natural and (latterly) social sciences. These have encompassed fields as apparently diverse as cybernetics and artificial intelligence, quantum physics, the new neuro-sciences, organizational management, and economic and social theory.[8] To date, complexity theory, *sui generis,* has had a relatively limited impact on the legal field, though a theory of legal autopoiesis[9] has developed from the work, chiefly, of two German scholars, the sociologist Niklas Luhmann and the jurist Gunther Teubner.[10] This has become, since its emergence in the 1980s, an increasingly influential, but still primarily Euro-centric branch of legal theory.

Conceptually, complexity theory can be viewed in the social sciences as a species of systems theory. To this extent it can be linked to the projects of theorists such as Durkheim and Parsons, who were concerned less with a search for the causes of social phenomena than in seeing cultures systemically as functionally interrelated parts. Philosophically, there is a strong link here with both structuralist and

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Council seminar on 'The language of complexity,' Keele University, England, September 25, 1998, *available at* www.keele.ac.uk/depts/stt/cstt2/comp/medd.htm (last accessed Aug. 2, 2003).

[6]Kevin Dooley, *A Complex Adaptive Systems Model of Organization Change,* 1 NONLINEAR DYNAMICS PSYCHOLOGY & LIFE SCIENCE 69 (1997).

[7]This has resonance with the notion of path dependency in evolutionary theory. For an example of the use of that concept in legal analysis, see Mark J. Roe, *Chaos and Evolution in Law and Economics* 109 HARV. L. REV 641 (1996).

[8]*See*, *e.g.*, Stuart A. Kauffman, *The Sciences of Complexity and Origins of Order,* PSA: PROCEEEDINGS OF THE BIENNIAL MEETING OF THE PHILOSOPHY OF SCIENCE ASSOCIATION, at 299-300 (1990); Dominic Chu, Roger Strand & Ragnar Fjelland, *Theories of Complexity: Common Denominators of Complex Systems,* 8(3) COMPLEXITY 19 (2003), *seriatim*.

[9]The term "autopoiesis" derives from the Greek, "poiesis" meaning production hence autopoiesis as auto- or self-production. The term first appeared in work in molecular biology by Humberto Maturana and his associates. *See*, *e.g.*, Francisco Varela, Humberto Maturana & Roberto Uribe, *Autopoiesis: The Organization of Living Systems, its Characterization and a Model*, 5 BIOSYSTEMS 187 (1974); HUMBERTO MATURANA & FRANCISCO VARELA, AUTOPOIESIS AND COGNITION (1980).

[10]*See generally* NIKLAS LUHMANN, SOCIAL SYSTEMS (1995); Niklas Luhmann, *Operational Closure and Structural Coupling: The Differentiation of the Legal System* 13 CARDOZO L. REV. 1419 (1992); GUNTHER TEUBNER, AUTOPOIETIC LAW: A NEW APPROACH TO LAW AND SOCIETY (1988); GUNTHER TEUBNER & ALBERTO FEBBRAJO (EDS) STATE, LAW AND ECONOMY AS AUTOPOIETIC SYSTEMS: REGULATION AND AUTONOMY IN A NEW PERSPECTIVE (1992); Michael King & Anton Schütz, *The Ambitious Modesty of Niklas Luhmann,* 21 J. LAW & SOCIETY 261 (1994).

phenomenological traditions,[11] and, indeed with features of so-called postmodern thought.[12] The linkages to the phenomenological and postmodern are particularly significant for the normative turn to complexity that I propose in this paper.

Classical structuralism starts from the contention that knowledge cannot simply be grounded in individuals and their historically contingent situations. It is fundamentally a "science of relationships" with the emphasis being upon the interconnections forged between different "social relations" within a (social) system.[13] The primary focus in this analysis is on language and communication, since it is communication that defines the ways in which meaning is produced by and passes between different social systems. Following the structuralist linguistics of Saussure, language is treated as self-referential and as a system in which subjectivity and the social world is created independently of the intentions and meanings of any individual agent. This idea is extended in systems theory by writers such as Luhmann[14] who argue that, with increasing social complexity, a system comes to possess its own rationality, separate from the rationality of those subjects who interact within it.

It is also in this regard (among others) that complexity theory, I suggest, owes a debt to the phenomenological tradition.[15] Phenomenology asks us "to question nothing less than our culture.… our way of looking at and being in the world in

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[11]I am conscious this will appear as an unlikely conjunction since structuralism itself, it is often asserted, both emerged from and constituted a break with phenomenology. However, JACQUES DERRIDA in WRITING AND DIFFERENCE, (trans. Alan Bass, 1978) has shown that at the heart of this apparent paradox lies a relationship of dependency in which structuralism and phenomenology are locked into a reciprocal *aporia* by which each perspective not only puts the other constantly into question, but thereby (as it were from the opposite sides of the paradox) generates from the other its greatest insights.

[12]It will become apparent from what follows that I also reject a clear cleavage between structuralism, phenomenology and so-called post-structuralist thought. For those interested in the reasons why, see CHRISTOPHER NORRIS, DECONSTRUCTION: THEORY AND PRACTICE 42-55 (1982). On the relationship between complexity theory and post-structural-ism/postmodernism, see generally PAUL CILLIERS, COMPLEXITY AND POSTMODERNISM (1998). In respect of legal autopoiesis, Paterson and Teubner similarly assert: "In a view of law as a concatenation of communicative events based on a code which deparadoxifies a basic self-referential relation, autopoiesis has strong (s)elective affinities with discourse analysis as developed by the *maître-penseurs* of post-structuralism: Foucault, Lyotard and Derrida." *See* Paterson & Teubner, *supra* note 3 at 454.

[13]TIM MAY, SITUATING SOCIAL THEORY 45 (1996).

[14]*See* NIKLAS LUHMANN, THE DIFFERENTIATION OF SOCIETY (trans S. Holmes & C. Larmore, 1982).

[15]*See* Medd & Haynes, *supra* note 5, for discussion specifically of LUHMANN, *supra* note 10, as involving a phenomenology "without the subject;" *cf. also* Alessandra Lippucci, *Cybernetic Analysis and Human Agency* (1998) 4 RES PUBLICA 77 (arguing that autopoietic theory can incorporate a stronger account of human agency in enabling law and other function systems to co-evolve in ways that fall between the optimism of existentialism and the pessimism of postmodernism); space precludes development of Luhmann's phenomenology here; for a general overview of the role of both phenomenology and systems theory in the development of modern German philosophical and legal thought. *See* JAMES E. HERGET, CONTEMPORARY GERMAN LEGAL PHILOSOPHY (1996).

which we have been brought up."[16] It requires us to step behind what Husserl called the "natural attitude" which leads people to treat the world around them as a given. Complexity theory shares with the postmodern a skeptical phenomenology of knowledge. Paul Cilliers thus makes the point that individual agents cannot contain, perhaps cannot even comprehend, the complexity of the system of which they are part. The self is so imbricated in the system it helps to create that no complete or, indeed, objective knowledge of its present state is available to any one individual.[17] It follows from this that complexity challenges, in a somewhat postmodern fashion, the idea that we can attain a privileged viewpoint that gives us access to 'the truth' about the world.

The postmodern (or perhaps more properly post-structural) character of complexity theory also comes through in its emphasis on discourse as a process separate from the intentions of any discursive agents. Complexity theory treats society as a system of communications which take on differentiated meanings in different sub-systems, each of which is, in its own right, a complex system. For an event to be understood, it must be given meaning ("coded") within a system. It may then be dealt with as if created in that system. The coding of an event as a "crime" or a "tort", for example, is a necessary pre-requisite to further decisions about that event which will give it additional meanings within the legal system. The event coded as a crime or tort thus becomes translated and reconstituted in the communicative world of criminal or civil procedure, evidence and so on.

These wider perspectives shape the way in which complexity theory characterizes the complex. It is an approach which warns us against excessive emphasis on formalism, on rule-based (as opposed to simply rule-described[18]) representations, and on individual agency as opposed to the pursuit of a relational, holistic[19] and systemic understanding of a world that is irremediably complex. What complexity theory offers is some corrective to "top-down" thinking about law and society which starts from the logic of governance. Such models are themselves attempts to simplify complexity – too often they reify the tendency of governance to seek to control complexity by processes of standardization and routinization. Complexity theory provides, by contrast, an insight into the local, the unplanned and unintended, the order that emerges at the edge of chaos. It raises the prospect that

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[16]K.H. Wolff, *Phenomenology and Sociology* in A HISTORY OF SOCIOLOGICAL ANALYSIS 500 (ED TOM BOTTOMORE & ROBERT A. NISBET, 1979).

[17]CILLIERS, *supra* note 12 at 122-23.

[18]*See* WILLIAM BECHTEL & ADELE ABRAHAMSEN, CONNECTIONISM AND THE HUMAN MIND: AN INTRODUCTION TO PARALLEL PROCESSING IN NETWORKS 227 (1991) discussing the idea that the behavior of the cognitive system is not rule-governed, but only rule-described. For a discussion of the significance of this distinction and a call for an epistemology of law and legal education that is more attuned to complexity, see Julian Webb, *Where the Action Is: Developing Artistry in Legal Education* 2 INT. J. LEGAL PROFESSION 187 at 188-96 (1995).

[19]I use this term in the sense developed by Putnam to counter the idea that there can only be one (or one primary) relationship between a symbol and the thing it represents, rather it implies that the construction of meaning is itself a relational and contingent activity. *See* HILARY PUTNAM, REPRESENTATION AND REALITY (1988).

such "micro events ... are typically more transformative than those generated on the macroscopic scale."[20]

At the same time, the acknowledgment of complexity serves to remind us that no single model can adequately describe "the social" as a whole, and I recognize that there are significant difficulties in applying complexity science *pro tanto* to the social sphere. Nevertheless it is the premise of this paper that complexity as a concept and complexity theory as a tool have some value, both in describing and re-thinking what is possible for the socio-legal world. These applications are the respective subjects of the next two sections of this paper.

III. A DESCRIPTION: SIX CHARACTERISTICS OF COMPLEXITY[21]

The complexity of complexity tests our capacities even to describe cogently what characteristics are fundamental to complex systems, so my description is inevitably itself an act of mapping which involves a simplified and schematic representation. Moreover, the absence of a unifying theory means that there is often a lack of common language and some significant local differences of approach which I will tend to gloss over in what follows. At some points I am deliberately reluctant to describe the characteristics of structure, environment, self-organization, reflexivity and adaptivity in any strictly causal or hierarchical fashion, since complexity theory itself warns us against such assumptions. I have therefore discussed these characteristics as two sets of linkages, in a manner that seems best to reflect the way that they function.

A. Structure and Environment

As noted above the focus of complexity theory is on the structural behavior of systems rather than just that of their elements, components or persons. For the purposes of complexity theory, the notion of structure relates to the internal mechanisms of the system. An analysis of such individual components *per se* would not necessarily disclose complexity, however; indeed, the hallmark of complex systems is the rich *interaction* of essentially simple elements, each of which responds only to limited information or stimulus.[22] Complexity thus emerges actively out of these patterns of interaction, and in such a way that suggests an absence of clearly linear normative hierarchies.[23] It follows too that complex structures are not designed as such; rather, the structure is a product of the interaction between the

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[20]Haynes, *supra* note 5.

[21]Except where noted otherwise, this section draws heavily on CILLIERS, *supra,* and RAYMOND A. EVE, SARA HORSFALL & MARY E. LEE (EDS.) CHAOS, COMPLEXITY AND SOCIOLOGY (1997).

[22]Hence, in social systems, it is only in relation that the self communicates and becomes part of a dynamic interaction, but it follows that beyond the limits of this information flow "[t]he self does not amount to much." JEAN-FRANCOIS LYOTARD, THE POSTMODERN CONDITION 15 (1984).

[23]In the language of systems theory, for example, the tendency is to talk of "tangled hierarchies" or "strange loops" in an attempt to describe the recursive and pluralistic processes of norm creation and validation that seem to shape the modern legal system. *See* Niklas Luhmann, *L'unité du système juridique* 31 ARCHIVES DE PHILOSOPHIE DU DROIT 174 (1986).

system and its environment.[24] Law is thus one of many functioning social sub-systems and, at the same time, it is an environment for other social sub-systems, just as the economic, scientific and political (etc.) sub-systems provide an environment for law.

Environment is a critical component of complexity, for, as Schütz points out, "[t]he environment has the system in its power"[25] because it is the environment that determines the communications that are conveyed to the system. And yet (again it may seem paradoxically) the environment is also essentially inactive. Systems construct and use their boundaries to "constitute and maintain themselves by creating and maintaining a difference from their environment... boundary maintenance is system maintenance."[26] Moreover, it is the system (not the environment) that determines the fate of communications from other co-evolutionary systems – such "perturbations," in the language of autopoiesis, will be irrelevant unless and until they are transformed into autopoietic responses by the system itself. So why does complexity concern itself at all with the environment? As Schütz continues (it might be noted in a strongly phenomenological vein):

> Four *lemmata* instead of an answer: (1) The environment *isolates* the self; there are as many environments as selves. (2) The environment *absorbs* direct external dependency: it limits the possibilities of the self. (3) The environment is the figure in which "being" appears: "the environment is what it is" – whereas.... the self is endlessly in the "making". (4) In spite of all this, only this disarmed, de-ontologized, de-substantialized, self communicates, acts, decides. The self and not the environment, is the heir of *Dasein,* to the extent to which this Heideggerian notion makes sense within autopoiesis.[27]

The complexities of the relationship between system, self and environment are an established problematic in respect of legal autopoiesis, and, though the issue as a whole goes beyond the concerns of this paper, it will be touched on again in the final section. For now there is one other point concerning the environment worthy of note, which is that autopoietic theory assumes that the operations of a system depend on the system's ability to distinguish itself from its environment, and this in turn is a reflexive act, since it too depends on the operations of that same system.[28] This insight is critical in understanding the role of two other key characteristics: the self-organizing character of systems and their openness (or not) to external forces.

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[24]Though, as I will explain below, the relationship between system and environment is not characterized as a simple input-output model. Although there are events that look like inputs and outputs, input-output causality is not a primary determinant of change in complex systems (indeed autopoietic theory specifically denies the possibility – and so seeks to avoid the language - of input-output dynamics).

[25]Anton Schütz, *Desiring Society: Autopoiesis Beyond the Paradigm of Mastership*, 5 LAW AND CRITIQUE 149, 161 (1994).

[26]LUHMANN, *supra* note 10 at 17.

[27]Schütz, *supra* note 25 at 161 (emphasis in the original).

[28]NIKLAS LUHMANN, ECOLOGICAL COMMUNICATIONS 144 (1989).

B. Self-organization, Reflexivity and Adaptivity

Self-organization is very much the *sine qua non* of complexity theory, since it explains how the structure of complex systems emerges, develops, and evolves. Self-organization is defined as an emergent property of complex systems. It is neither a product of external agency, nor of internal design and control. Rather, it is a result of interaction between the present state of the system, its history, and its environment. Cilliers offers a simple example:[29] We can imagine a school of fish behind a dam. As the conditions of the lake vary, the size of the school will adjust itself optimally to reflect the prevailing conditions. The school as a system is self-organizing and adaptive (in the sense that it is sensitive to changing conditions in the light of experience). But there is no agent telling the school what to do, and no sense in which each individual fish understands the complexity of the situation. The fish, as individual components of the system, can only operate according to their limited local information and whatever general (behavioral) principles fish have. There are five important and constant facets of such systems.

First, self-organization is an inherently *reflexive* process in which systems act upon themselves. In social theoretical terms, complexity theory, by embracing reflexivity thus seeks to overcome social theory's obsession with transcendental explanations of phenomena.[30]

In mechanical terms, reflexivity does not mean that complex systems are entirely closed to external stimuli. It does mean that what is going on is a more complex process than is assumed by conventional models of causation. A self-organizing system is an autonomous system, which reacts to its environment and transforms itself in the process. Complexity theory thus emphasises the importance of "emergence" – the idea that complexity is a (spontaneous) product of the behavior of the system, in the sense that there is no external *telos* or design shaping the process, and "feedback" which creates loops in the interaction, so that events, communications, feedback on themselves, sometimes instantaneously, sometimes after a number of intervening stages. The critical point is thus that the system's outputs recursively determine its future inputs.

Paterson and Teubner illustrate this by reference to the relationship between government, regulator, and regulated industry. Rather than treat this as "a single horizontal chain of causal relations," it can be viewed autopoietically as multiple "vertical chains of recursions."[31] This does not mean that regulatory attempts are doomed to failure, or have no effect on the regulated field. But it does mean that those effects cannot be interpreted in the usual causal fashion – regulatory effects are determined ultimately by "the *internal* construction of differences [between a present state of affairs and a desired one] by the industry and its attempts to minimize them."[32]

Recursivity does not mean that system features and responses are in any conventional sense predetermined. In fact, the reality is quite the reverse, since by

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[29]Cilliers, *supra* note 11, at 89-90.

[30]A tendency apparent, for example, in Husserl's emphasis on the transcendental subject, Habermas's transcendental rationality and Parsonian transcendental realism.

[31]Paterson & Teubner, *supra* note 2, at 457.

[32]*Id.* (emphasis added).

definition their structure is constantly evolving, simply in congruence with the aleatory changes to the environment. Moreover, reflexivity also precludes the possibility of any kind of long-term meta-description of the system. While such descriptions may be constructed, they are simply constructs that capture the system at a given moment. Such descriptions lack both future descriptive value and predictive force.

Second, self-organization is impossible without some element of institutional/systemic memory (for this reason a complex system always has a history). This memory is stored in a distributed fashion, that is, it consists of units of highly localized, relational significations. The importance of memory also helps explain why self-organizing systems tend to increase in complexity over time.

Third, as noted, complex systems are *adaptive*. They use the interplay of memory and environment continuously to adapt and "learn" from experience (though, as with the fish example we started with, adaptivity does not necessarily imply conscious changes in behavior). They create meaning/knowledge in use (e.g., principles and rules) through patterns of activity. In law, the notion of precedent provides an obvious example of this kind of systemic learning process, in which the system selectively remembers and forgets information (e.g., in the way precedent uses the distinction between material and non-material facts as a mechanism for institutionalized forgetting) in the business of creating itself.

An obvious point that should not be overlooked here is that one of the things complex systems must adapt to is their own complexity. Consequently, the operations of the system will themselves lead to increases or decreases in the complexity of the system,[33] though the overall tendency of complex systems seems to increase in complexity over time. This is a large part of the reason why complex systems (at least in the natural world and in simulations) tend to "age" and ultimately decay.

Fourth, the distributed nature of memory both limits the possibility of any agent controlling the system and enhances its adaptivity. In deconstructionist terms, each signifier carries no more than a *trace* of the system's memory,[34] so that meaning is scattered or dispersed along a whole chain of signifiers, and it can never fully be present in any single sign. The operation of the system *qua* system is determined by the patterns of such traces, but since these patterns are themselves constantly in flux, it is not possible to predict with any high degree of certainty the outcome of any communication within the system. Thus, even as agents organize their behavior in response to a legal norm, their actions are as likely as not to vary or even render nugatory the legislative intent (so far as that is discerned or discernible) behind that norm.[35] One important consequence of this is that the system lacks significant control over the construction even of its own code (in the case of law, the primary distinction being legal/illegal).

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[33] LUHMANN, *supra* note 10, at 27, 46-47.

[34] The concept *trace* is used in the sense of a trail or "footprint." For Derrida, a signifier is always already inhabited by the trace of another sign, though that sign itself is forever absent.

[35] *Cf.* the distinction drawn by sociologist Guy Rocher between the *efficacité* (the capacity to produce intended results) and *effectivité* (the capacity to generate social effects in general) of law – *L' effectivité du droit* in ANDREE LAJOIE *et al, THEORIES ET EMERGENCE DU DROIT: PLURALISME, SURDETERMINATION ET EFFECTIVITE* (1998).

Lastly, self-organized complexity derives also from a mix of cooperation and competition between units. While competition, particularly for scarce resources, helps drive the development of structure,[36] complex systems are also characterized by high connectivity, mutual dependency (of units) and net-like causal structures.[37] Cooperation, therefore, is necessary to form connections and associations among units. Indeed, in social systems it is increasingly being recognized that (informal) networks of agents[38] and processes of negotiation within and between networks perform a key function in achieving the cooperation necessary for systems to function.[39] Co-operation also serves to generate stability in complex systems.[40] This is important because complex systems are *strictu sensu* unstable insofar as outcomes are (as we have seen) relatively unpredictable.[41] Stability then is a feature that cannot necessarily be engineered into the system, but which will emerge, more or less spontaneously (and one can assume disappear equally spontaneously) in the functioning of the system.

C. Openness

Complex systems are open to environmental stimuli which cross their borders from other systems. Many complexity theorists thus speak of the *co-evolution* of systems. Yet, at the same time, as we have seen, there is also a strong sense in which such systems are recursively closed. How do we understand this apparent paradox?

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[36]If resources were unlimited, there would be no pressure on units to create boundaries and limits within the system (and between systems).

[37]*See* Inger-Johanne Sand, *Understanding the New Forms of Governance: Mutually Interdependent, Reflexive, Destabilised and Competing Institutions* 4 EUROPEAN L. REV. 271 (1998) (arguing that the European Union as a legal system consists of mutually interdependent, reflexive and competing institutions).

[38]In law, this tendency can be seen in varying degrees in work on global business and the new *lex mercatoria, e.g*. Gunther Teubner, "*Global Bukowina*:" *Legal Pluralism in the World Society* in GUNTHER TEUBNER (ED.) GLOBAL LAW WITHOUT A STATE (1997), in the theory of relational contract, *e.g*., IAN R MACNEIL, CONTRACTS: EXCHANGE TRANSACTIONS AND RELATIONSHIPS (1971), and in the growing interest in the role of trust *e.g*., NIKLAS LUHMANN, TRUST AND POWER (1979), and *guanxi* networks, *e.g*., RICHARD P. APPELBAUM, WILLIAM L.F. FELSTINER & VOLKMAR GESSNER (EDS.) RULES AND NETWORKS: THE LEGAL CULTURE OF GLOBAL BUSINESS TRANSACTIONS 325-402 (2001), in social and legal relations.

[39]*See* Lane Tracy, *Negotiation: An Emergent Process of Living Systems*, 40 BEHAVIOURAL SCIENCE 41 (1995). *See also* ROBERT AXELROD'S seminal work, THE EVOLUTION OF COOPERATION (1984).

[40]*See* ROBERT AXELROD, THE COMPLEXITY OF COOPERATION, 70 (1997).

[41]Unstable events are classically defined in the natural sciences as those which have no observable probable cause. In complexity theory, instability is an observed feature which is said to flow from the recursive nature of the system, where "even very small deviations in the initial conditions are reinforced in such a way that similar starting constellations are leading after a very short time period to totally opposite system developments .... In the case of a non-linear and recursive system dynamics ... no prediction of the system's development is possible." Wolfgang Krohn & Günter Küppers, *Selbsreferenz und Planung*, 1 SELBSTORGANISATION 101 (1990) (cited in translation by Paterson & Teubner *supra* note 2, at 454).

First, it is acknowledged that entirely closed systems are no more than complicated, rather than complex, so openness must be a condition of complexity. Systems must in some sense be open to their environments. Complexity theory then encounters a definitional problem associated with the "radical openness"[42] of some potential systems – that is a degree of openness which makes it extremely difficult to separate and confine the (features of the) system from its environment. For practical purposes of analysis, at the very least, radical openness, where it is apparent, must also be made reducible.[43] Even if this can be achieved, what kind of openness are we left with? In autopoietic theory the apparent paradox between openness and closure is thought to be overcome by a distinction between cognitive openness (the receptiveness of the system to its environment, and hence its capacity to learn) and normative closure – a concept that seems to be succinctly caught by Luhmann in talking about the legal field, when he observes that "only the law can change the law".[44] Normative closure thus reflects the process of transformation which communications must undergo to become part of the system, rather than simply part of the environment. Hence, a communication must first be understood as "legal before it can have a (systemic) effect on the legal system.[45]

There is a further feature of openness that only really becomes evident if we consider the nature of language itself as a complex system.[46] While Saussure understood language as a closed system, Derrida, starts, in terms that are more consistent with complexity, from a position in which language is fundamentally open. Derrida follows Saussure in defining the meaning of a sign in terms of its relationships with other signs in the system. Such relationships in language are, for Derrida, playful, changing, unpredictable. Because the sign is only constituted by these relationships, it has no positive content, no meaning that is entirely its 'own'; it consists only of traces (of other signs).[47] Meaning thus has a basic instability and is in constant flux. Communication as a process is thus a purveyor of largely indeterminate meaning, until that meaning is fixed albeit temporarily within a specific process of interaction. Meaning-making thus involves (becomes) the

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[42]Chu et al., *supra* note 8 at 24-5.

[43]While one must acknowledge that the boundaries of a system are a product of observation and analysis and hence inherently constructed, the practical risk remains, of course, that we (as observers), in seeking to reduce openness, produce a system that is a wholly artificial construct.

[44]Niklas Luhmann, *The Self-Reproduction of Law and its Limits* in GUNTHER TEUBNER (ED), DILEMMAS OF LAW IN THE WELFARE STATE 111, 113 (1986).

[45]As a side issue, one can acknowledge with critics of autopoiesis that this insight, of itself, is not so radically divergent from a range of, perhaps, less troubling theories which seek to explain the autonomy of law, without dispensing with the role of agency to the extent that autopoiesis appears to do so. *See*, *e.g.*, Patrick Capps & Henrik Palmer Olsen, *Legal Autonomy and Reflexive Rationality in Complex Societies* 11 SOCIAL & LEGAL STUDIES 550, 552 (2002).

[46]This idea is explicitly developed in LUHMANN, *supra* note 10.

[47]JACQUES DERRIDA, POSITIONS 26 (Alan Bass, trans. 1981).

representation, selection and reduction of complexity in a moment of actuality,[48] and the issue of meaning-making in itself is an important part of our understanding of how complexity is represented and processed in the social world.[49]

Taking the above characteristics of complexity, I have sought to indicate some ways in which law can be analyzed as a complex system. But there is also a danger in this. The important issue that flows from my last point is whether 'complexity' helps us to understand and shape the social. One of the criticisms of autopoietic theory, as we have seen, is that it has primarily a descriptive/deconstructive rather than normative/reconstructive force. Much work on complexity similarly tends to assume the complexity of the social in the first place and limits itself to a description and analysis of that. Analysis is not something I wish to treat as an end in itself. The ultimate question for me is whether an understanding of complexity can help us in the project of normative reconstruction.

IV. COMPLEXITY, ETHICS AND NORMATIVE RECONSTRUCTION

My starting point is a simple assertion: Complexity raises a major ethical issue for the law, that is, how can we advance the emancipatory goals of law in the face of law's complexity? As Nicola Lacey asserts,

> one of the most urgent ethical questions has to do with how diverse peoples, subjectivities, cultures, values, ways of life can be recognized without abandoning the recognition of our common humanity, our interdependence, our need to live together within a variety of co-coordinating institutions such as the legal.[50]

In some regards, complexity theory seems to offer us little hope. If modernity has been marked by the development of a formal, atomistic notion of the citizen and an associated and progressive exclusion of questions of ethics from the public sphere (thus, the privatization of morality, which has been one of the triumphs of liberal legalism, has also encompassed its marginalization), then postmodern complexity apparently threatens to take the individual citizen out of the reckoning all together. As I have already noted, one of Luhmann's contributions is the insight that we can never stand outside of the system. Not only are we a part of the system and its workings, we have little choice but to accept that the system will organize and adapt itself in the manner most likely to ensure its survival. If we leave the analysis at this point, then the obvious conclusion is the pessimistic and positivistic one, as the poet Auden put it, "the Law is the Law" and resistance to law is likely to achieve little or no immediate gain. But this is not the end of the story.

It is my assertion that complexity does have a part to play, both conceptually and empirically. Socio-legal theory as a framework for social action requires three

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[48]LUHMANN, *supra* note 10, 80-4. It would seem to follow that the reduction of openness (both of meaning and perhaps more generally) is thus an important part of the process of managing complexity.

[49]Cillers put this as a larger claim: "the dynamics that generate meaning in language can be used to describe the dynamics of complex systems in general." Cillers, *supra* note 12, at 37ff.

[50]Lacey, *supra* note 4, at 137.

elements:[51] Broadly-based theoretical understanding and systemic analysis; an (empirical) knowledge of institutions which shape and are shaped by law, and an understanding of what might constitute adequate political practice(s). Complexity (theory) can provide a distinctive contribution to at least the first two parts of this equation. Let me conclude by offering a non-exhaustive set of illustrations.

First, complexity serves to remind us of the inevitability of the truism that the law delivers justice as much by accident as by design. I do not say this to deny the possibility of justice, but to emphasise its unpredictability and to encourage emancipatory movements to embrace the uncertainty this provides. It is both an opening for, as well as a closure of the emancipatory potential of law. For individuals interested in strategies of justice, the promise of complexity is that (despite its analytical exclusion of the individual[52]) collective and even individual action will form part of the environment of a system and can make a difference. The fact that the magnitude or direction of change is often unpredictable offers both the possibility that the outcomes of hegemonic strategies of the state and the institutions of global capital are less certain than their progenitors predict, and the potential that, like the metaphorical butterfly beating its wings, a small change can have substantial systemic consequences.

Second, complexity has a deconstructive value, which should not be ignored. It can assist our "understanding" of the way ethical and normative concerns are constructed discursively within and between different sub-systems (e.g., the psychic, political, religious and legal systems). Each of these systems may be self-referentially closed, but they also depend on each other to produce a version of disturbing events which displays normative consistency – this gives an air of rationality to the process, reinforcing our sense of social cohesion and "public understanding" of the world, at the same time as it disguises the very complexity and "*ad hoc*-ery" of the processes underlying the construction of such meanings. On the other hand, a failure to achieve normative consistency between systems will generate system-conflicts in the coding of individual events (e.g., illegal but morally justified), and may well generate short-term responses in one or more systems to deal with the perturbations caused. These critical events too may be viewed as valuable in providing sites at which the inherent stresses and strains caused by system closure, boundary failure, or by the incompatibility of communicative systems become visible.

Third, far from demanding a mechanistic and positivistic view of society, there is a plausible normative dimension to complexity by which values can be seen as emergent properties of social systems – including the legal system. This is not to say that there is something inherently ethical about such systems, or that there is a plausible "ethics of self-organization,"[53] but it does mean that there are certain values which functionally support the maintenance and development of systems in their complexity, some of which may have ethical implications. Aside from the obvious candidates, such as justice and human dignity, examples relevant to the legal system

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[51] *Cf. id* at 142-43.

[52] I address this problem in my final observation in this section, below.

[53] *See* CILLIERS, *supra* note 12, at 111. I would add that this is not least because some of these values are likely to be non-moral. For a brief discussion of non-moral values, *see* JOHN KEKES, THE MORALITY OF PLURALISM 44-5 (1993).

might include: Altruism,[54] decentralization/structural pluralism,[55] and interdependence.[56] Work to uncover more fully the emergent values of the legal system would self-evidently support a project of normative reconstruction.

Lastly, I suggest there is scope within complexity theory to acknowledge and develop the scope of the ethical itself.

Rule-based modelling of language and of the mind joined with Enlightenment philosophy to construct the dream (which in fact has become the nightmare) of modernism: a categorical and universal basis to the ethical imperative, which has dwindled into systems of "coercive normative regulation."[57] Complexity theory and postmodern ethics deny us the luxury of that delusion. Just as we can never escape from the agonistics of the system, I suggest we can never escape from the call to ethics. But our traditional ethical resources are inadequate to this task.[58] The solution, in so far as there is one, may be found in the work of postmodern theorists such as Derrida and Emmanuel Levinas.[59]

While we may start from the almost Hegelian assumption that we are constituted within the social system(s), this does not necessarily preclude us from taking ethical responsibility. Although conventional systems theory appears disempowering in this regard, this is a product of mis-reading. As Schütz argues:

> What autopoiesis parts with, is not the requirement of attributing consequences of behavior to persons .... It is the assumption according to which responsibility is, in fact, not attributed but *given*, as something that exists and that, therefore, needs only to be found or *discovered.* Autopoiesis questions the hypothesis that something like a pre-established symmetry reigns between history, as the sum total of what happens to or inside society, and a meta-social *authorship* regarding this happening,

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[54]CILLIERS, *supra* note 12; AXELROD, *supra* note 39.

[55]TEUBNER, *supra* note 38.

[56]Sand, *supra* note 37, at 285, thus makes the point that supranational trends in European legal governance are replacing classical notions of sovereignty with a model of relative autonomy in which politico-legal institutions operate increasingly in relations of mutual interdependence and functional co-operation.

[57]ZYGMUNT BAUMAN, POSTMODERN ETHICS 4 (1993).

[58]"[T]he scale of possible consequences of human actions have long outgrown the moral imagination of the actors .... Moral responsibility prompts us to care that our children are fed, clad and shod; it cannot offer us much practical advice, however, when faced with numbing images of a depleted, dessicated and overheated planet which our children and the children of our children will inherit.…" *Id.* at 217-18.

[59]*See* the valuable contribution by DRUCILLA CORNELL, THE PHILOSOPHY OF THE LIMIT (1992) applying some of these insights to "questions of ethics, justice and legal interpretation," and also my own development of Levinasian thought in the field of lawyers' ethics. Julian Webb, *Being a Lawyer/Being a Human Being* [2002] LEGAL ETHICS 130.

> from whose reign an equation between history and responsibility, and between happening and power, can then be inferred.[60]

The expansion of social differentiation has cost "society" the capacity to control its own destiny, and yet, at the same time, it has created numerous new possibilities for challenging the present way of the world. Law provides one mechanism for such challenges, provided we are prepared to take responsibility for that happening.

Responsibility is the key precisely because "whatever responsibility is ascribed to society is ascribed by society,"[61] otherwise responsibility becomes wholly illusory; it would demand a society that has "defeated, domesticated, colonized its own conditions"[62] and mastered its own environment, a claim that complexity makes implausible.

So, what do I mean by responsibility within a complex system? Complexity, we have seen, emphasizes the distributed nature of power; the inability of any person (or institution) to claim that it exerts control over society. All individuals, all social institutions are alike confronted by conditions of contingency, uncertainty and risk. Any stability that emerges, emerges from within society and that means from the interactions of social agents. It is this combination of factors that creates the opening for action and demands from us a significantly different form of responsibility.

Following Levinas,[63] ethical responsibility in a postmodern world needs to be pre-ontological, grounded otherwise than in being. Here, in this metaphysical space, this original relationship with what Levinas calls the "Other," there can be no duty, no obligation, no reason that compels me to act. Rather, the "Other" compels me simply by her being. Morally, I have no choice but to act for the "Other." This is the commitment to what Bauman calls "an ethics of long hands."[64] In a system dominated by localized knowledge and unpredictable consequences, we are confronted, in Derrida's terms, by an *aporia*: we have to take responsibility for the effects of all our decisions, now and for the future, even though we do not (complexity suggests cannot) know what these effects are, and we cannot wait to see what the future will bring. It is in this commitment to action *now* that the possibility exists of emancipatory law in the face of complexity.

V. REFLE/X/CT/ION?

In this paper I have done no more than begin a process of envisioning the normative possibilities for law in complexity, and that at a relatively low level. Nevertheless, it is a beginning. As a way, I hope, of developing debate and in lieu of a more traditional conclusion,[65] I will end (and thus recursively begin) by raising

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[60]Schütz, *supra* note 25 at 158-59 (emphasis in the original). *See also* John Paterson, *Who is Zenon Bankowski Talking to? The Person in the Sight of Autopoiesis* 8 RATIO JURIS 212, 217-19 (1995).

[61]Schütz, *supra* note 25, at 160.

[62]*Id.*

[63]Notably EMMANUAL LEVINAS, OTHERWISE THAN BEING, OR BEYOND ESSENCE 3, 112 (1981).

[64]BAUMAN, *supra* note 57, at 218.

[65]A resistance, if you will, to the normal temptation of the normative, to hasten to a conclusion – "the point where the payoff is to be found – the what to do?, the prescription, the

what appear to be some key questions about the kind of normative work necessary if we are to take seriously the complexity of law:

As I have already observed, an important preliminary task is to assess more fully the values emergent within a complex legal system, thereby enabling us take a more adequate account of complexity. So, what are these values?

The question that follows from this as a matter of course is, how, if it all, do we sustain those values in the face of the unpredictability of a complex legal system?

Complexity also begs a re-analysis of meta-concepts like 'rights' – much critical theorising has uncovered the partiality of rights discourse within liberal legalism, and challenged many of our assumption about the substantive worth of specific rights. Complexity theory invites us to look further at the construction of rights as a process, rather than as an output of legal discourse, and through the functional lenses the theory provides.

How do we regard (legal) rules that breach our expectations of moral legitimacy? Should they be broken? If we say they cannot, and we are caught by what critics see as a modified version of positivism, then arguably there is no primacy of the moral, not in a hierarchical sense, but in the sense of the pre-ontological commitment to agency which precludes us from treating all others as universally the same, even in the face of a sometimes disempowering complexity and standardization. Can we step beyond the problem of auto-legitimation of law? And, if so, does the answer lie in formulating some sense of the relational/community values that form part of the environment; principles of otherness/difference, or other concepts?[66]

In this context, and more specifically, can/should we treat principles like the principle of legality and the Rule of Law first and foremost, as ethical rather than purely procedural principles?[67] Despite hegemonic abuses, they are a source of stability, security and personal and political freedom. Even within a complex social system they provide an important basis for limiting the abuse of naked power. Surely this is and should remain a core function of law?

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recommendation ... the point at which normative legal thought is supposed to graft its thought onto a social or juridical reality outside the text." Pierre Schlag, *Normativity and the Politics of Form,* 139 U. PA. L. REV. 801, 931 (1991).

[66]Note that CILLIERS suggests complexity could require a significant transformation of our understanding of the concept "rule," from rules that are "part of an abstract set of rules bound by logical relationships" to "quasi-rule[s] emerging from a complex set of relationships, [whereby] part of the *structure* of this kind of rule will be the possibility *not* to follow it." *Supra* note 12 at 139 (emphasis in the original). *Cf.* Paterson and Teubner's discussion of self-regulation and "tangential responses" to regulatory problems in which regulators "give up any attempt to establish stable structures … [and] change the strategy and adapt their stimuli to the tangential response character." *Supra* note 3, at 474-75.

[67]*See also* Jiří Přibáň, *Beyond Procedural Legitimation: Legality and Its 'Infictions'* 24 J. LAW & SOCIETY 331 (1997).