International Law as an Autopoietic System

Anthony D'Amato*

Everything appears complex until a good theory of it has been developed. – the late Robert Nozick

A foreigner visiting Oxford or Cambridge for the first time is shown a number of colleges, libraries, playing fields, museums, scientific departments and administrative offices. He then asks “But where is the University? I have seen where the members of the College live, where the Registrar works, where the scientists experiment and the rest. But I have not yet seen the University in which reside and work the members of your University.” It then has to be explained to him that the University is not another collateral institution, some ulterior counterpart to the colleges, laboratories and offices which he has seen. The University is just the way in which all that he has already seen is organized. – Gilbert Ryle.²

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International law has been characterized by political and legal sceptics as a grab-bag of rules that national actors dip into when they need a convenient norm to justify or add legitimacy to decisions already reached on other grounds. In contrast, many scholars of international law defend their subject by emphasizing the important role it plays or can play in helping to bring peace and human rights to the nations of the world. Implicitly they are saying that if international law is a grab-bag, it's the only one between here and anarchy. The sceptics and scholars speak past each other.

In part because their positions are asymmetrical. The sceptics do not need a unifying theory of international law; if the world of international relations is a jungle, then international law merely has rhetorical force— which is what the sceptics believed in the first place. By contrast legal scholars are constrained to accept the burden of showing that the assortment of international norms is not random. They need a systematic theory of international law—a theory of everything—to be able to defeat sceptical ad-hocery.

To be sure, there have been academic suggestions from time to time that concepts such as consent, reciprocity, or reasonableness supply the

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3 Hans Morgenthau, Scientific Man vs. Power Politics, 121 (1946), decrying "the illusion of international law as a standard for political action." A New Yorker cartoon of a few years ago showed a president, who resembled President Clinton, handing a draft back to his speechwriter, with the caption, "Put in more references to international law."

4 See, e.g., Robert H. Bork, The Limits of "International Law", The National Interest, 3 (Winter 1989/90), concluding, "International law thus serves, both internationally and domestically, as a basis for a rhetoric of recrimination directed at the United States."

5 To borrow the current 'TOE' terminology from theoretical physics.

6 Louis Jaffe observed in 1933 that "consent is given to international law as a system rather than to each and every relationship contained in it." Louis Jaffe, Judicial Aspects of Foreign Relations, 90 (1933). His theory, though suggestively heuristic, relies upon a fictional presumed consent. Far different is a theory of consent that would require individual states to consent to any particular rule before becoming bound by that rule, as is suggested by proponents of the "persistent objector doctrine." Such a rule would undermine the legal authority of norms, giving an individual an opportunistic chance to opt out at will. The result would be to change the meaning of international law from a coercive system of rules to a set of guidelines that may be accepted or rejected at the discretion of the acting state. More simply, it would amount to the claim that international law is not law.
needed unification and inner connectivity for international law. But these concepts are too vague and problematic to serve as explanatory theories. At best they are limited views of international law.

A unified, systematic theory of international law would have value beyond satisfying the academic standard of theoretical coherence. For one thing, it would help make international law more acceptable to government officials and the public by reinforcing the conception that international norms exist independently of the will of any particular state. A given state official does not have to justify to the media her policy

7 The theory of reciprocity is also suggestive as a partial explanation for national compliance with norms, but it is far from a comprehensive explanation. Reciprocity appears to explain why, if nation A enforces what it calls an international legal norm against nation B, then nation A is legally vulnerable to similar enforcement against itself by nation B, or even by C or D. Georges Scelle famously observed that reciprocity is embodied in the daily work of foreign service officers and foreign claims officials who perform a dual role: passing upon the legitimacy of claims of foreign nations, and asserting the claims of their own nation. This dédoublement fonctionnel tends to actualize the normative claim of reciprocity in real-world dealings among nations. See Georges Scelle, 2 Précis de droit des gens: Principes et systématique, 4, 10-12 (1934). However, reciprocity will always be a weak normative claim because of the discounted value of future events. Nation A may assert a claim for X today even though nation B next year might assert a similar claim X against A. The present value of X always exceeds the future cost of X (assuming constant dollars), which is why interest must be added to the repayment. Moreover, it is always possible for A to argue — disingenuously perhaps — that its own claim of X is materially different from next year's assertion of X by another state. For example, the United States could argue that it may legally launch a unilateral invasion against Iraq that would be materially different from nation C launching a unilateral invasion against D a year from now. Nevertheless, reciprocity is discussed later in this Article for its role as a filter for the processing of rules by the international legal system (the "ILS").

8 Myres McDougal famously propounded "reasonableness" as the ultimate criterion of international legality. See Myres McDougal, Studies in World Public Order, 778 (1960). "Reasonableness" may be vague, but it is not vacuous. However, all his examples demonstrated that the reasonableness he had in mind was to be assessed from the point of view of the United States. For a critique, see Anthony D'Amato, The Concept of Custom in International Law, 215-29 (1971) [hereinafter D'Amato, Concept of Custom], also at <http://anthonydamato.law.northwestern.edu/ILC-2001/Books.htm>. In the present Article, the ultimate criterion of international legality is the self-perpetuation of the international legal system. It adopts the point of view of the system itself and not that of a state or person.
choice if and when it is in accordance with an international rule; she only has to say that, like everyone else, she must obey the law. Second, a systematic theory would offer to any state official a simple binary choice: either accept the existing package of international norms, or reject the package in its entirety and become an international outlaw. Thus the payoff for systematizing the set of international norms is an a priori de-justification of a state’s right to pick and choose only those norms that would paper over its immediate political objectives.

Accordingly, this Article contends that international law is best described and explained as (what will be defined as) an autopoietic system of norm-generation and norm-recognition. The autopoietic model offers a heuristically powerful explanation of how international law functions, why it persists, and why it ‘works.’ It is at least a candidate for the unified theory that international legal scholars have been seeking.

But there is also a third value, perhaps the most important: the value of predicting international law in the way that an experienced lawyer predicts the law of her own country. This benefit of systematic theory can only be achieved by the construction of a workable model of the law-making and law-determining processes of the international law system (hereinafter, the “ILS”). Consider the analogy to domestic law. In assessing the legal ramifications of a client’s situation, the lawyer constructs a mental picture of a judge reading a legal text. This mental model of judge-plus-text is a powerful mental tool – even if automatic or reflexive – for applying the law to a set of facts. In contrast to a layperson who might simply look up ‘the law’ in a text, the lawyer knows that what is in the text must eventually be filtered through the mind of a judge. The judge-plus-text model thus assists the lawyer in understanding and predicting how the law will ‘play out’ in practice. The lawyer knows that a text or statute does not interpret itself; she also knows that her client’s reading of the statute is not often a reliable way of accessing legal information. She further knows that how she herself interprets the statute is not definitive, because there will be an opposing lawyer with a different construction of the text if the case is ever litigated or threatened to be litigated. What the lawyer does know is that the statute has to be read the way a judge or panel of judges might eventually have to read it and apply it to her client’s fact situation. She must read the statute from the judicial point of view – the way a judge would read it. Her

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9 No historical example has been found of a state choosing total international outlawry.
experience with the mental model of a judge reading texts – gained in law school and then in practice – provides her with the ability to substitute the judge's viewpoint for her own. (After all, the judge took the same law-school courses for three years that she took.) Thus the model of judge-plus-text turns out to be the lawyer's most important tool for predicting what the law will say in respect of her client's fact situation.

The ILS model similarly enables law practitioners and scholars to predict what international law will say about given fact situations. The major differences in the ILS model compared to the domestic model are the absence of a judge and the absence of a definitive text. This does not make the ILS a simple model; in fact, it makes it moderately more complex. Even in those very few instances in international law where a judge is present in the decisional process – that is, when a question of international law is presented to a court – the judge will apply the mental model of the ILS in order to ascertain the law. Thus in nearly every international-law case the ILS model substitutes for the corresponding domestic-law model of judge-plus-text. Like the domestic judge-plus-text model, the most important function of the ILS model is to assist officials, judges, lawyers, the media, and scholars in predicting how inter-

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10 "Law school training is a socialization process involving many aspects of legal prediction.... The accuracy of [the lawyer's] prediction is enhanced because the [judge] has also gone through the same educational process, thus learning what kinds of decisions are expected from him." Anthony D'Amato, The Limits of Legal Realism, 87 Yale L. J. 468, 492-93 (1978) [hereinafter D'Amato, Legal Realism], also at Code A78a, <http://anthonydamato.law.northwestern.edu/papers-1/recent%20articles.html#jurisprudence>.

11 Models can be either simple or complex. Simple models are reductionist; they help us understand the real world by reducing it to a few ideas. Complex models, on the other hand, try to mirror the real world, enabling users to understand the real world by running simulations on these models. The ILS model described in the present Article is situated somewhat between these two extremes. It is moderately complex; that is, simulations can be run on it with the addition of further internal mechanisms to help digest the real world's outputs. See also n. 23, infra.

12 Of the thousands of legal conflicts that occur almost daily among nations, probably fewer than one-one-hundredth of one percent will find their way to an international court or tribunal for resolution.
national law assesses or will assess the legal aspects of any given event, situation, or clash of claims.\textsuperscript{13}

The ILS model is disembodied and transparent.\textsuperscript{14} Its transparency is a virtue compared to the domestic model because it lacks the black-box element of the idiosyncratic human judge.\textsuperscript{15} Yet the ILS model is no less real than the domestic model. It exists in the world’s noosphere.\textsuperscript{16} It is distinct from the events, situations, and claim-conflicts of the physical world upon which it is called to pass legal judgment – even though, as we shall see, it is a self-reflexive player in the physical world that is able in part to control its own destiny.

When a judge, lawyer, or scholar applies the ILS model, it is not necessarily done in full awareness of the model. The internal mechanism of the ILS model to be described in this Article has already been ‘internalized’ with some fuzziness in the minds of those who wish to access it as a result of their training, reading, and experience. This Article simply attempts to make the picture of the model clearer. It is a blueprint of the most important internal wiring of the model.\textsuperscript{17} Or, stated alternatively,

\begin{itemize}
\item \textsuperscript{13} Prediction is the ultimate test of the validity of any scientific theory or methodology. When a paper is published in a scientific journal presenting a theory and describing an experiment that proves it, other scientists will attempt to disprove the author’s theory by repeating the experiment. If the original theory is not thereby falsified, then the original experiment has successfully predicted future experiments that can verify it. See Karl Popper, Objective Knowledge, 8-17 (rev. ed. 1979). One of the most famous predictions was Einstein’s theory, based upon his model of general relativity, that paths of light would bend in the vicinity of massive objects. This theory was verified several years after Einstein predicted it in a scientific expedition to Principe, Africa, during the full solar eclipse of 1919.
\item \textsuperscript{14} Law itself does not exist in the physical sense. If the human race were to die out, law would die out. Law is a mental construct dependent for its existence upon communications. It is the complexity of that mental construct that justifies the attribution of “system” to a body of interconnected rules and procedures.
\item \textsuperscript{15} See, e.g., D’Amato, Legal Realism at 502-05.
\item \textsuperscript{16} Teilhard De Chardin regards the noosphere as a global consciousness of infinite complexity created by human thought and culture. See Pierre Teilhard de Chardin, The Formation of the Noosphere (1947).
\item \textsuperscript{17} Innumerable details remain for further specification and application by interested scholars.
\end{itemize}
it helps clarify the mental processes of thinking about international law and systematizing international law.

Sometimes the mental processes of international practitioners and scholars track an explicit internal process of the ILS. For example, practitioners and scholars consult precedents. The library of precedents they consult (whether found in books or on the internet) is the same as the precedents contained in the databank of the ILS. Matching a present claim against past precedents is part of a lawyer’s training. However, there are some internal processes of the ILS that are less perspicuous. Perhaps the most important is the internal presumption-mechanism of the ILS, to be examined below, that analyzes whether an international-law claim will tend to favor the system's own self-preservation. Although self-preservation is crucial from the viewpoint of the ILS, paradoxically it is probably the least-conscious element in the minds of judges, attorneys, and scholars who are called upon to resolve questions of international legality. Yet one of the assumptions of the present Article is that, at a deep and maybe subconscious level, practitioners and scholars of international law are indeed cognizant of the law's self-preservation bias. They may be intuitively aware that international

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18 Even here, however, international precedents may differ from domestic precedents in the following way. Suppose under domestic law an act X is adjudicated in court to have been legal. A short time later, a lawsuit is brought against the perpetrators of act Y, which is similar in every relevant respect to act X except that it occurred at a later date. Under domestic law, the Y-lawsuit would be dismissed for reason of stare decisis. Now suppose under international law that a state (e.g., the United States) conducts a nuclear weapons test X in the South Pacific that delivers a near-lethal shock to the oceanic ecology. If there are no further tests, the ecological system will self-repair over time. Assume further that the international community regards X as having been legal. Now, a short time later, another nation (e.g., France) decides to conduct a similar nuclear test Y in the same area. Again, as in the domestic example, the only difference between X and Y is that Y occurs later in time. But what if scientists report that Y will completely destroy the oceanic ecology in the vicinity of the test because X had already rendered the ecology vulnerable? In short, the claim is that the precedent act X itself changes the condition of the legal landscape, and hence although X was legal, Y would be illegal. This particular question (of the viability of precedents) has not come up formally in international practice, but it has been mooted. See Anthony D’Amato, Legal Aspects of the French Nuclear Tests, 61 Am. J. Int’l L., 66 (1967).

19 Even in domestic law, a lawyer or scholar may get the feeling over time that the law is a kind of world in itself that strives to be consistent, to ‘heal’ oc-
law strives to protect itself by favouring claims that promote systemic order while coding as 'illegal' those claims that point toward anarchy and the death of the legal system.\textsuperscript{20} This awareness is sometimes manifested by noticing the connectivity of norms in the databank, and at other times by an almost intuitive and immediate reaction that a given international-law claim is too outrageous to be entertained.\textsuperscript{21} Thus the ILS model, far from being a pictorial restatement of the existing literature on the formation and assessment of international norms, in fact yields usable predictions and assessments of international law that might not have been made in its absence. The ILS model may contribute to a deeper understanding of international law, a more transparent explication of the law-making process, and greater accessibility of the concept of international law to government officials, practitioners, scholars, and students. Or so this Article contends.

I. Introduction to the ILS Model

A. Autopoiesis and Recursiveness

Autopoietic theory began in 1980 and since then has been applied to biological, social, and some conceptual systems (the term 'systems' will be described below). A few writers have taken the lead in suggesting the application of autopoietic theory to international law.\textsuperscript{22} Building upon

\textsuperscript{20} At a deep level, judges may have the same preference for order over anarchy because it preserves their own position of power within a society. This argument is spelled out in \textit{D'Amato}, Legal Realism at 469-71.

\textsuperscript{21} For example, Claims N and M as hypothesized later in this Article.

and partially modifying their guiding insights, the present Article undertakes to construct a heuristically useful model of the ILS.

The construction of a moderately complex model is a recursive process. In the course of the construction, the model's internal mechanism is tinkered with to fit the very norms it is called upon to justify and explain. The back-and-forth adjustment process is designed to ensure that the model tracks the way the real world deals with questions of international law.

Recursiveness is inherent in constructing complex models. Although it may appear to be question-begging, recursiveness is necessary because the model itself is self-referential.\textsuperscript{23} The ILS constantly reviews external claims for the effect that they will have on the self-perpetuation of the ILS itself. Moreover, the use of a system to simulate real-world decisional processes requires that connections be made in the system's internal wiring so as to make the system increasingly useful and explanatory as a living model that adjusts itself over time to surviving in its environment. Since the purpose of the system emerges from its components, the validity of its organization is a recursive function of its purpose.\textsuperscript{24} A good complex systems model fits most of the data that went into it and explains why the rest of the data is not covered.\textsuperscript{25} The ILS model, in particular, only needs to fit the norms that are order-producing; it may reject norms that are anarchy-producing, as will be explained below.

One cannot define such a system in advance; rather, the organic characteristics of the model must await the end of the back-and-forth construction/adjustment process. Therefore, only by the end of this Article will the proffered model of the ILS have been defined and constructed. Everything until then is just a partial view of a work in progress. The final model will then make sense holistically if it succeeds in self-

\textsuperscript{23} The recursive nature of constructing a system is neither license nor excuse to use circular reasoning in describing it.

\textsuperscript{24} Teubner refers to the "essentially circular nature of law." Teubner, Law, 11.

\textsuperscript{25} A model that fits the real world exactly would be like the apocryphal map of London that is as large as London itself. Even so there are classes of models. Simple models are stimulants to theorizing; moderately complex models, such as the ILS, attempt to capture the more important processes of the real world in order to find a middle ground between theorizing and exact simulation. Finally, complex models are attempts to simulate the processes of the real world.
justifying the explication of the international lawmaking process that went into its construction.

B. Cybernetics, System and Emergence

It is appropriate at this moment to take a brief look at the history of general systems theory and become reminded of some of its more important concepts. The move toward a unifying theory of legal systems in general and of the international legal system in particular started in the unrelated field of cybernetics in the 1940s. The mathematician John von Neumann, with a team of engineers, developed for the U.S. military a torpedo that would self-adjust to home in on its target. The torpedo received feedback from its target in much the same way that a household thermostat receives feedback from its environment.\(^\text{26}\) Many diverse fields, such as engineering, management, and social science, saw the value of cybernetic modelling in their own research. An attempt was made in 1975 to apply cybernetic modelling to law,\(^\text{27}\) but what was not fully available at that time were the insights that would be furnished by biologists and physicists pursuing an offshoot of cybernetics: general systems theory and autopoiesis.

The general systems model grew rapidly in acceptance across disciplinary boundaries. A system was considered to be a mechanical or theoretical organization of components, distinct from its environment, that added something new, and often unexpected, to our understanding of the ensemble of components out of which it was constructed.\(^\text{28}\) One

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\(^{26}\) See Norbert Wiener, Cybernetics (1948).


\(^{28}\) See, e.g., Ervin Laszlo (ed.), The Relevance of General Systems Theory (1972); The World System: Models, Norms, Variations (E. Laszlo ed. 1973); G. Klir, An Approach to General Systems Theory (1969); W. Ross Ashby, Design for a Brain (1960); Stafford Beer, Cybernetics and Management (1959); Warren McCulloch, Embodiments of Mind (1965); J. Sutherland, A General Systems Philosophy for the Social and Behavioral Sciences (1973); Modern Sys-
common definition that was generally accepted by researchers was that a system is a self-organized collection of elements that are interconnected in the sense that any force imparted to one of them affects the positions of all of them. Ludwig von Bertalanffy defined a system as a "complex of mutually interacting components." But a system is more than that; it is an entity in itself that is different from, and perhaps greater than, the sum of its parts. For example, any living organism is something quite distinct – and unpredictable – from the collection of its chemical elements. ‘Living matter’ could not have been predicted from such a collection. Or to take a case of an inert element: imagine meeting someone living on a remote island in the equatorial zone in the Pacific Ocean who had never seen nor heard about ice. He would hardly have reason to believe you if you said that cooling water makes it so hard that people can walk on it. Ice is an emergent property of water (and water is an emergent property of ice).

‘Emergence’ is a useful term in the study of systems. An organic system emerges from a collection of live cells. The ability to introduce order in the world (negentropy) is an emergent property of organic systems. A city is more than the sum of its urban neighbourhoods, as Jane Jacobs pointed out in her classic study written before the emergence of the concept of emergence. A university is more than a collection of

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29 A system can be open or closed, and still fit this definition. Thus, the human body is an open system (because it ingests oxygen and food and excretes carbon dioxide and waste products). But if we enlarged our definition to ‘human body + environment’, then it could be regarded as a closed system. This frame-of-reference problem is similar to the problem of the entropy of system vs. subsystem; see Gregoire Nicolis/Ilya Prigogine, Exploring Complexity, 160-64 (1989).


colleges, residence halls, laboratories, museums, administration buildings, and playing fields. Morality is an emergent property of populations. Consciousness is an emergent property of the billions of neurons in our brains. One cannot search a brain and find a centre for consciousness; there is no such centre, no homunculus, no ghost in the machine. A brain, according to the neuropsychologist Paul Broks, is just an internally interconnected lump of meat. Consciousness is something qualitatively different from the axons, dendrites, and synapses in the interior flesh of the skull.

Not all emergent properties are systems, but most heuristically useful systems emerge from lower-level units or combinations of rules or other material components. A conceptual system, such as the ILS, can be viewed as an emergent property of an assortment of rules, norms, and principles that, in interacting with those norms, recursively imposes

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33 Supra, n. 2, and the epigraph to this Article.
37 Up to the present time, the most powerful computers are unable (outside of science fiction) to become conscious. Perhaps some day, when a silicon chip is hit by a mega-bolt of electricity in just the right spot, the program for a conscious computer might emerge. It is of interest that the outputs of a moderately complex software program are now recognized by artificial intelligence researchers as unpredictable by human intelligence except by actually running the program on a computer. There is no general decision procedure for determining whether a formula has a solution; Hilbert’s tenth problem was solved in the negative by Julia Robinson and Yuri Matijasevich in 1970.
38 Emergence is not just a property of systems; for example, ice is an emergent property of water, and water is an emergent property of ice. If someone living in a tropical climate had never seen ice, he would hardly have reason to believe you if you told him that cooled water becomes hard and one can then walk on it.
39 Strictly speaking, a top-down organization like the U.S. Congress is not a “system” although the word is sometimes loosely applied to it. Heuristically useful systems are bottom-up; they are complex adaptive units that display emergent behaviour. See Steven Johnson, Emergence: The Connected Lives of Ants, Brains, Cities, and Software, 18 (2001).
a meaningful organization upon them. For system-sceptics, another way of looking at this is to say that international law displays a deep structure that can be pictured by an appropriately constructed model that we can call the ILS.

All autopoietic systems (to be defined) have an emergent quality: they try to perpetuate themselves. Thus the ILS is ‘motivated’ with regard to its own longevity. Its successful imposition of a workable set of organized norms upon states and their subjects over time is the means by which the ILS itself survives.\(^40\) In brief, the ILS both organizes itself and manipulates its environment to increase the probability of its self-perpetuation.\(^41\)

When we impute self-perpetuation to constructed autopoietic systems such as the ILS, we find that the internal wiring of the system (which we shall explore) produces outputs that enhance the system’s own chances of survival. By understanding the internal wiring, we are better able to predict the system’s outputs. The internal wiring itself, as we shall see, is a product of the system’s evolution over time. The system is not hardwired; rather, it has a wiring structure that resists change but does not forbid it.\(^42\)

The system’s ‘outputs’ are just its decisions (its ‘coding’) upon claims or events coming from its environment (the real world). The coding attaches the conclusions ‘legal’ or ‘illegal’ to these claims. The claims – coming from the environment and feeding into the system – are the system’s ‘inputs’.

Not every communication directed to the ILS is an input. No legal system, including the ILS, is able to evaluate and code each of the billions of daily real-world communications in the environment. If there were

\(^{40}\) Similarly, we experience “living” so long as our conscious self is aware of its perdurance over time. When consciousness ends, a person is pronounced “brain dead” and, though the body may still function in a vegetative or comatose state, most courts have reached the conclusion that if the patient had expressed a will to die under such circumstances, the “right to die” will be honoured.

\(^{41}\) Conversely, in studying a system, the most important thing we know about it is that it has survived. A biologist can conceptually ‘reverse engineer’ a turtle to try to understand why it has survived for so long, although it is very difficult to find out what other biological systems would have occupied the ecological niche that turtles occupy if there had been no turtles.

\(^{42}\) A general-systems definition of ‘structure’ might be ‘that which resists evolution.’
such a thing as a totally comprehensive legal code, it would bring to mind the old quip about German law: that which is not forbidden is compulsory. A biological system would have to expend too much energy, and exhaust its memory storage capacity, if it had to notice all the items in its environment, much less assign a code to each of them. The same principle of minimizing energy costs applies to the ILS.

When the ILS outputs a code (makes a decision), the coding does not have to be binary in the sense insisted upon in the literature on legal systems.\(^{43}\) It does not have to code an input as either ‘legal’ or ‘illegal’. It suffices for the ILS to code some inputs as ‘illegal’ and say nothing about the rest.\(^ {44}\) For example, a legal system has no need to expend energy informing a thief who mistakenly steals his own car that what he has done is legal; that outcome is derivative upon the system’s occasional coding as illegal the act of a thief who steals someone else’s property. Thus, from the point of view of the real world, communications are sent to the ILS and they come back either with a coding of ‘illegal’ or with no coding at all. The story is different if we look at the internal mechanism of the ILS. There we shall find a more complex canalizing process that uses internal codes. This topic will be taken up below.

In inputting and outputting information, the ILS interacts with its environment.\(^ {45}\) Indeed, it is a player in that environment. When it processes an input and chooses to code it as illegal, the new coded output slightly alters the environment. The environment’s legal landscape is modified because new information has been added; the old rules need to be rethought or reinterpreted to the extent that they connect or clash with the new rule. Thus the ILS is a dynamic process; it does not operate in short bursts like punctuated equilibrium; rather, it functions continuously even as it evolves continuously.

All the functions and internal wiring of the ILS are arranged to achieve the system’s goal of self-perpetuation. Postulating the self-perpetuation

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\(^{43}\) The literature insists that the binary legal/illegal coding is the *sine qua non* attribute of legal systems. See, e.g., Gunther Teubner, Global Bukowina: Legal Pluralism in the World Society, in Global Law Without a State, 12 (Teubner ed. 1997) (the global legal discourse “closes its meaning boundaries by the use of the legal/illegal binary code”).

\(^{44}\) This is still a binary coding in that the code “illegal” corresponds to the digit 1 and the decision not-to-code corresponds to the digit 0.

\(^{45}\) One of the ways that mammals interact with their environment is by breathing. They input oxygen and output carbon dioxide.
of the international legal system not only assists in predicting outputs, but it goes a long way to explaining what otherwise might be mysterious: why and how international law selects, codes, reacts, and adapts to the inputs coming in from the real world. The systems approach generally serves at least six functions in this regard: it provides a basis for an efficient descriptive model of the international system incorporating minimalist empirical assumptions of state behaviour; it provides conceptual linkages with other biological and social systems; it provides causally explanatory theories for existing norms; it helps predict how the body of international law will assess the legality or illegality of real-world claims; it assists in identifying emerging norms of international law; and it strengthens the rule of law by tying the norms together in a bundle.47

C. Autopoiesis

In 1980, biologists Humberto Maturana and Francisco Varela refined the concept of the self-organization of systems. Their theory of autopoiesis defines living systems as self-producing units which maintain their essential form, perpetuating themselves according to their internal organization.48 Thereafter social scientists including Niklas Luhmann

46 The term “norms” is not used in a rigorous sense here. Similar words with varying shades of meanings can be found in modern languages, referring generally to verbal rules, directives, standards, guidelines, and imperatives either expressed or implied. The term “law” refers generally to those norms, rules, directives, principles, standards, or guidelines that are capable of shaping or channelling human behaviour.

47 A bundle of sticks is far stronger than the sum of the strengths of the individual sticks. A strong rope can be made from weaving together short strands of kemp. The bundle and the rope thus have emergent properties (once one is aware of emergence, one tends to find it everywhere!).

and Gunther Teubner took the initiative in suggesting the application of autopoiesis to legal systems\(^{49}\) and other social organizations.\(^{50}\) Luhmann, Teubner, and their colleagues view communications, not individuals, as the main elements that organize and construct legal systems. Communications build upon past communications in a circular fashion.\(^{51}\) In order to receive, act upon, or be modified by communications, an autopoietic system must be sufficiently autonomous from its environment.\(^{52}\) A sufficiently autonomous system is one that self-describes, self-produces, and self-maintains its own elements and processes. Its autonomy cannot be complete; it must remain "cognitively open but operatively closed."\(^{53}\) For without perceiving and incorporat-


\(^{51}\) Autopoietic systems are internally recursive; they must be described in circular fashion, much as a polycentric network is described – a proposition long ago recognized by Professor Fuller. See \textit{The Principles of Social Order: Selected Essays of Lon L. Fuller}, 111-21 (Winston ed. 1981).

\(^{52}\) Naturally, human observers are needed; the ILS is a construct, not an actual living organism. It is necessarily true that the demarcation of a social system is contextualized with respect to the observer effecting the demarcation. The fundamental epistemological tenet of autopoietic theory is that: "Everything said is said by an observer." \textit{Maturana, supra} n. 48, at xix. The Luhmann-Teubner adaptation of autopoiesis to legal systems appears to render the observer irrelevant. Not only is their approach an apparent unjustified departure from the Maturana-Varela paradigm, but it also fails to capture the unique status of international publicists as a subsidiary source of international law. Yet under Article 38 of the Statute of the International Court of Justice, and many leading cases, the publicist is an active participant in the determination of international law and hence part of the very thing that is being observed. For further analysis of this point with case citations, see \textit{Anthony D'Amato}, What Does it Mean To Be an Internationalist? 10 Michigan J. Int'l L., 102 (1989).

ing new events into its structure, the legal system would become a mere tautology and negate itself over time. Instead, outside communications act as ‘triggers’ within the system and perturb its operations in a selective manner. The degree of perturbation is a function of the system’s internal structure and processes.

Autopoietic theory as it has been applied to law explains how a legal system evolves and reproduces itself solely in reference to an internal logic. The theory adapts particularly well to the international arena where single actors in the environment only have an incidental and often unpredictable effect on the whole. The international legal system has evolved by adopting rules that promote conflict-resolution among these single actors. By resolving conflicts that arise in its environment, the system perfects its own internal processes, which then recursively render the environment even friendlier to the continued life of the system. (Another way of looking at this is to say that the legal system and its environment co-evolve.) Autopoiesis explains how a system such as the ILS, in its interrelationship with its environment, can attain relative autonomy and flexible coherence. The system ‘observes’ claims issuing from the environment, describes or codes them in relation to its own internal constitutive structure, and then either assimilates them (thus affecting that internal structure – the way that a biological system takes in and assimilates food which then becomes part of itself) – or

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54 For a similar critique that highlights the positivistic overtones of Luhmann’s idea of a closed system, see Arthur J. Jacobson, Book Review of Autopoietic Law, 87 Mich. L. Rev., 1647, 1649 (1989).

55 Teubner, Law 24. A human being, for example, evolves only according to its own genes that control its cellular structure. It adapts to its environment over time (evolutionary selection theory), but its environment does not control its reproduction. A system’s reproduction is internal, not external.


57 Teubner reaches a similar conclusion by a different path. He argues that evolutionary functions such as variation, selection, stabilization, and retention are transposed over time into the legal system. “This process of internalization shifts the dynamic of evolution from the environment into the system itself, and subordinates it to the logic of legal autopoiesis.” Teubner, Law, 56.

58 Teubner says that law and its (social) environment are “co-evolving systems” which “exert an indirect influence on each other.” Teubner, Law, 61.

stores them in memory.\textsuperscript{60} Stored communications can later be retrieved and either assimilated, deleted, or modified.

D. A Modification of Binary Coding for Legal Systems

One of the main modifications\textsuperscript{61} proposed in this Article to the auto-poiesis of legal systems is to enrich the binary coding procedure that has so far been accepted by other theorists of legal systems. Although binary coding is retained for every question asked of the system – resulting in a ‘yes’ or ‘no’ answer like the 0 or 1 response of every computer program or the ‘fire’ or ‘do not fire’ response of every neuron in a brain – we have already seen that the only output needed is the code ‘illegal.’ But it is the mechanisms within the ILS that are the focus of the present Article.

The following decision tree is proposed as a general decisional model for any legal system. With suitable terminological modifications, which are not attempted here, it can be applied to common-law or civil-law systems within states. Although the decision tree will be refined later in the article, Figure 1 is presented here to introduce the more important internal-wiring connections of the ILS:

\textsuperscript{60} These are the two system-significant (internal) outcomes that can be seen at the bottom of the “decision tree” in section D, directly following.

\textsuperscript{61} Another important modification, introduced later on in the text, is the addition of sanctioning rules (“tertiary rules”) to the primary and secondary rules of the system.
Figure 1. A decision tree for autopoietic legal systems (first approximation).

```
Illegal?
  ↓
  bias filters
  ↓
Search database
  ↓
  Yes  No
  ↓
Code  Legal?
  ↓
Store  Yes  No
  ↓
OUTPUT  Code  Virtual Law
  ↓
  Assimilate  Code
  ↓
  Store
```

The left half of the decision tree leading to ‘OUTPUT’ indicates that the only answer the real world obtains from the ILS is whether an inputted claim is illegal. For example, Iraq in 1990 invades Kuwait under a claim of right, saying that Kuwait really belongs to Iraq but was stripped away by the illegal action of the League of Nations. Iraq’s invasion is both an event and a claim (an event/claim). The ILS in 1990 coded this event/claim as illegal. A different event/claim, such as a failure by one head of state to attend the funeral of another head of state, would not be coded by the ILS at the present time as illegal. The decision tree would reflect this assumption by regarding the funeral event/claim as ‘not illegal’ and proceeding to ask further questions of it.

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62 Although international law regarded territorial acquisition by conquest as legal up through the nineteenth century, the almost universally-adopted Kellogg-Briand Pact of 1928 decisively changed the ILS coding to ‘illegal’, that is, any attempt to acquire territory by conquest is illegal.
without taking the step of coding it. These further questions, beginning with the inquiry whether the event/claim is or is not ‘legal,’ throw no further light on real-world communications; they are significant only in adding to the data base generated by the ILS, and hence shall be postponed until later in this Article.

A procedure for testing the structural validity of the proposed tree is to reword it to describe the decisional processes of a familiar autopoietic system. A familiar system is ourselves. An animal system (including humans) in viewing its environment will appear to be guided by a decision tree that looks like the following:

\[\text{Figure 2. A Simplified Decision Tree for Biological Systems}\]

\[
\begin{align*}
\text{Harmful?} \\
& | \\
\text{bias filter} \\
& | \\
\text{Search memory} \\
& | \\
\text{Yes} & \text{No} \\
& | \\
\text{Code} & \text{FOOD?} \\
& | \\
\text{Stop} & \text{Yes} & \text{No} \\
& | \\
\text{Code} & \text{Stop} \\
& | \\
\text{Assimilate}
\end{align*}
\]

---

63 The animal's first decision is whether an object in the environment is harmful. It first applies a presumption-mechanism (e.g., a visual test, a taste test, a memory test). If the object is harmful (a lion, a forest fire, a rattlesnake, or a poisonous mushroom) it is coded as harmful (and the coding is taught, if possible, to the animal's offspring). If an object is not harmful, it is not necessarily edible. Edibles can be organic (some plants, some animals) or inorganic (water, salt crystals). Edibles are then assimilated by ingestion into the organism's system and become part of the organism ("you are what you eat").
Figure 2 constitutes a rough proof of the systemic validity of (at least the top half of) Figure 1.\textsuperscript{64}

II. Accessing the ILS

A hungry organism does not taste every item in its vicinity to see whether the item is ingestible. For one thing, it has no awareness of many of the items in its environment (a fish is unaware of the water). Second, it may have learned from experience (including the experience coded in its genes – its 'intuition') whether an item is 'food.' The human animal not only selects food from its environment, but also is a consumer of communications from other humans. The communications analogy is better for purposes of the present Article. For example, our vision is confined to a very narrow band of the electromagnetic spectrum (the 'visible' spectrum). We are unaware of other vast portions of that spectrum, including radio and television waves. Thus we are oblivious in our normal waking lives to what is said on television (fortunately); we can only access the radio and television wavelengths by artificial means.

When by sensory means (whether or not aided by electronic instruments) we receive communications, we process them according to the linkages in our brains.\textsuperscript{65} Thus a person in a psychological state of denial will simply not process certain information that contradicts the paradigm in his mind. Religious faith is related to psychological denial; it is a rigid internal wiring that rejects all arguments, no matter how rational, that challenge that faith. Everyone is stubborn to some extent; everyone's mind has its own software program that varies in flexibility and receptivity. As every good lecturer knows, if a lecture is to make any lasting impression on students' minds, it must contain enough con-

\textsuperscript{64} The ILS has an opportunity to revise its database; thus, illegal decisions are stored so that they might later be overruled. Most biological systems, excluding humans, do not revise their memories in this fashion (if a given berry is poisonous, the squirrel is unlikely ever to change its opinion). Camouflage in nature tends to work because it makes the prey look to the predator as if it is harmful or neutral.

\textsuperscript{65} Not necessarily "hard-wired." Our brains form many of its structures in the first few years of life; these can be modified later, but only with considerable effort.
tact points with ideas that are already present in the students' minds. Then the lecture can do its assigned job of adding to, playing with, or even confronting those ideas. Unless enough contact points are built into the lecture, the student simply 'tunes out.'

A legal system only 'sees' a narrow bandwidth of its environment. Most social and cultural events are outside its visible range, such as art, literature, music, science, and sporting events. It does not even see certain things that seem to be replete with law, such as a debate in an international-law journal between two professors – the system will not play the role of judge in deciding who should win.

Obviously we must narrow the applicable range of a legal system even within its visible spectrum. The two principal narrowing devices are (a) who is making the claim? (b) what kind of claim is it?

A. Who Is Making the Claim?

The outputs of a legal system only address the subjects of the legal system. Yet it is the legal system itself that recursively defines the entities that are its subjects. For example, legislation enacted by the United States by its own terms applies to all natural persons physically present within the territory of the United States. There are extensions: US law applies by its own terms to any counterfeiter of American currency irrespective of nationality and irrespective of physical presence within or outside the United States.

Classically, the only subjects of international law were the states. In the classical era, the ILS only 'saw' states and did not 'see' people. But

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66 A common language is obviously one set of contact points. A lecturer who uses too much unfamiliar jargon will lose the students' attention.

67 A domestic legislature, of course, could introduce a bill on any subject and thus expand the reach of domestic law. The international system, lacking the virtue (or vice) of a legislature, is not as open-ended.

68 A (rough) analogy to domestic legal systems is that courts are reluctant to give advisory opinions.

69 The 'counterfeit extension' of the reach of domestic law is permitted by international law.

70 The term 'international law' is more misleading than the classical term it replaced: 'law of nations.' International law implies law that concerns the external relations of nations. The name was invented by Jeremy Bentham in 1789.
there were and still are problems around the edge of the term ‘states.’ For example, entities accorded many or most of the attributes of statehood under present international law include Puerto Rico, the Isle of Man, the Holy See, and Monaco. Native American ‘reservations’ have been regarded as quasi-states.\(^{71}\) Before the world’s land mass began coalescing into sovereign states in the fifteenth century, there were hundreds of kingdoms, duchies, principalities, tribal areas, and city-states. The more statelike a unit became, the more entitlements it enjoyed under international law, but the difference was quantitative and not qualitative.\(^{72}\) In 1948, the reach of international law was extended to the United Nations and, by implication, organizations in general.\(^{73}\) The biggest extension would be to all persons via the developing law of human rights.\(^{74}\) The most accepted extension has been to apply international law directly to persons who commit war crimes or crimes against humanity. James Crawford notes that the Security Council “regularly addresses injunctions to all sorts of bodies, opposition groups, and even individuals, using the language of international rights and obligations.”\(^{75}\) In the present Article, the term ‘subjects’ will for the most part be used to refer to states and organizations – and in some contexts, per-

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See Martin Janis, Jeremy Bentham and the Fashioning of ‘International Law’, 78 Am. J. Int’l L. 405 (1984). The law of nations suggests a law that emanates from the nations but is not restricted to governing their external relations. However, all this is water long under the bridge.


\(^{72}\) Ambassadorial immunity and the freedom to fish on the high seas are just two of the many basic international-law entitlements that are invariable across entities whether or not they are states. Today Puerto Rico, whose status is far from definitive, has its own territorial sea. The Lone Star Republic has retained its own territorial sea even though it became part of the United States and changed its name to Texas.


sons – that fall within the aegis of international law. (Sometimes for ease of exposition the term ‘states’ will be used.)

Nevertheless it is even imprecise to say that law applies directly to its subjects. Hegel was much closer to the mark in teaching that law addresses the relationships among its subjects. Robinson Crusoe may be marooned on an island belonging to a nearby state, but all the laws of that state make no difference to him unless and until another person appears, at which point the law applies directly to their relationship with one another. If there were just three states in the world, there would be four different relationships among them that the law would address directly (AB, AC, BC, and ABC). If there were four states, there would be eleven relationships (AB, AC, AD, BC, BD, CD, ABC, ABD, ACD, BCD, ABCD). In a world of 190 states, the number of different configurations among them is 1,569,275,433,846,670,190,958,947, 355,801,916,604,025,588,861,116,008,628,224, a total somewhat larger than the State Department could keep track of on any given day. Fortunately, not all of these relationships generate legal questions that need to be attended to. Nevertheless international law applies to all of them. In this sense as well, the ILS exists and functions in the legal noosphere.

B. What Kind of Claim Is It?

The relationships that come to the attention of the ILS – its inputs – are those that generate claims. These claims generally arise out of what Michael Reisman calls “incidents.” For example, an act (or omission) may be undertaken under a claim of right, as was the United States invasion of Iraq in March 2003. Here the acting state was also the claimant. If no state complains, then the invasion does not trigger an input.

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76 As Professor Crawford reminds us, however, “When an entity needs to be a state, the threshold for statehood matters a great deal.” *Ibid.*

77 See G.W.F. Hegel, The Philosophy of Right (T.M. Knox, tr.).

78 If A and B are belligerents and C is neutral, then each of the four relationships has a distinct legal configuration.

79 Professor Paul Goerss of Northwestern’s Department of Mathematics calculated this result from the formula: $2^N - N - 1$, where $N$ is the number of states.

into the ILS (the ILS does not issue ‘advisory opinions’). However, if there is a claimant and a counter-claimant (the United States and Iraq), then that clash of claims triggers an input into the ILS.

Another category is actions or omissions that are not accompanied by any claim of right. State A may simply stop a foreign vessel on the high seas and then wait to see if the flag state complains. If there is a complaint, then a claim – i.e., “state A acted illegally” – is made to the ILS. Harder to notice are omissions. For example, state J may do nothing about arresting a foreign terrorist within its borders. Again, nothing happens unless there is a complaint. If another state notices J’s inaction and calls upon J to make the arrest, then J’s failure to do so could give rise to a claim that its omission was illegal. So long as there is a claimant and a counter-claimant, the question of illegality will be inputted to the ILS.

Since a clash of claims can occur in the absence of an ‘incident,’ a more inclusive term is ‘controversy.’ This appears to be a better term than ‘case’ in discussions of international law, because of the courtroom connotations of the word ‘case.’ The vast majority of international controversies do not involve courtroom litigation.\(^{81}\)

Because international tribunals are rarely invoked to settle controversies, they are usually settled in the real world. Indeed, most controversies in international relations play themselves out in the real world before the question of their legality is mooted – that is, the claims are settled one way or another. A settlement of an international claim is of primary significance in the formation of customary international law, because customary law grows out of the practice – and not necessarily the claims – of states.\(^{82}\) The primacy of practice over pronouncements is a lesson learned by the ILS over the millennia. A government may speak with many conflicting voices at the same time – in the United States, for example, the Justice Department, the State Department, and the President might simultaneously characterize the same act in mutually inconsistent legal terminology. But a state may say many things at once, it may only do one thing at a time. What states actually do is called the ‘practice of states’ from the viewpoint of customary-law for-

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\(^{81}\) For an expansion of these terms, see Anthony D’Amato, Finding Custom in an Incident, in International Law Anthology, 58 (A. D’Amato, ed., 1994).

\(^{82}\) For the distinction between practice and claims in the formation of customary international law, see D’Amato, Concept of Custom, 74-98.
Moreover, a state will often issue a ‘trial balloon’ — a claim under international law that it may or may not have any intention of implementing, depending upon the reactions of other states. Moreover, the implementation, if it comes, may be considerably softened from the terms of the trial balloon. The ILS would become hopelessly entangled in processing ill-defined claims if it tried to deal with all the claims that are made. Instead, the question of international legality — except in claim-clashes of great importance — usually is deferred to an after-the-fact determination.

The ‘aftermath’ of a controversy — whether and how it is settled sooner or later by the parties — is of critical factual importance to the ILS. International customary law by its very nature commingles facts and claims. This is one respect in which the ILS model under construction in the present Article differs from the models of autopoietic legal systems presented so far in the literature. Those models have been constructed largely with domestic legal systems in mind. In domestic legal systems, legal communications can be viewed as contained entirely within the legal sphere of discourse. By contrast, the ILS model processes real-world controversies directly, taking into account their context and possible settlement.

This difference between domestic legal systems and the ILS may be due to a relatively unexamined assumption about the former: that they proceed on an entirely textual basis. A domestic law-finder only needs to consult the texts of statutes and judicial decisions. If P sues D in a domestic court and the court dismisses the claim as inadequately framed, for all anyone knows P might then have threatened to amend the complaint and D, fearing this, offered to settle the case out of court. If this scenario occurs after the initial claim was dismissed, all ‘the law’ knows is that P’s complaint was dismissed, because that is all that the legal texts will reveal. The law knows nothing of the settlement whereby P obtained at least part of what he originally sought when he filed his claim in court. For every case filed in court, there are thousands of cases settled out of court; of the cases filed in court, a hundred are settled out of court for every one which proceeds to a final judgment. The vast majority of resolutions of conflicts that transpire within a domestic legal system are invisible to the law. One might deplore this invisibility as a failing of domestic legal systems to stay in touch with real, everyday appli-

83 “The state’s act is visible, real, and significant; it crystallizes policy and demonstrates which of the many possible rules of international law the acting state has decided to manifest.” D’Amato, Concept of Custom, 88.
cations of the law. In any event, it shows that experience with legal systems that are exclusively text-based may have led writers on autopoietic legal systems to regard all legal systems as sets of self-contained communications.

The lack of a significant number of judicial decisions in international law has perhaps made a virtue out of a necessity: international law must, and always has, taken into account the real-world aftermaths of controversies.

An example may illustrate the foregoing points. In 1954 the United States decided to undertake testing of hydrogen bombs in the South Pacific. It posted maps proclaiming the temporary restricted area of the potential radioactive fallout from the nuclear tests, warned vessels to stay out. The Soviet Union denounced the tests as illegal under international law, but apparently did not seriously consider the possibility of applying to the International Court of Justice for an injunction against the tests. Had it done so, the Court would have been faced with the difficult question whether international law protected the oceans against nuclear testing by a property rule, a liability rule, or no rule at all. But the nature of the question changed after the United States proceeded with the tests. Now there were no longer three choices, but only two: a liability rule or no rule. A real-world accommodation or settlement took place that answered this question in favour of a liability rule: the United States paid full compensation to the victims of the test accidents. However, there was a complication: the United States, preferring no-rule to liability-rule, paid $2 million to Japan "without reference to the question of legal liability." Japan, in turn, accepted the $2 million with the exculpatory clause included. Thus, although this example shows a completed controversy – a clash of claims and a settlement – it might appear to leave the question of legality unresolved. But the ILS model easily resolves the question. The ILS itself decides what

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84 Not only was 1954 at the height of the cold war, but both superpowers distrusted the International Court of Justice.


87 Id. at 764 n. 7.
code it wishes to assign to real-world events. It does not defer to the will of one or more states in this regard. The consequential fact in the hydrogen-bomb case was that the United States paid monetary compensation to victims of radioactive fallout from the tests. This payment was made irrespective of the comparative negligence of some vessels that sailed into the restricted area; in short, the governing rule was that of strict liability. It was not up to the United States or Japan to state the governing rule. It was not up to either or both of them to determine whether the settlement should be characterized as either an *ex gratia* payment or the discharge of a legal obligation. That determination is the exclusive job of the ILS.\(^8^8\) Since the ILS opts in favour of looking at what states do rather than what states say, it is clear that although the exculpatory clause may have saved face for the United States in 1954, it could not operate under the procedures of international-law formation to mask the hard fact of payment.

Since nearly all international ‘incidents’ and claim-conflicts are sooner or later settled, resolved, or come to rest some other way, the terms of the settlements are of great importance to the ILS. A settled controversy, from the viewpoint of the ILS, is one that contributes to world order. Whatever the terms of the settlement might be, the fact that both sides accepted it contributes to international peace and stability. In the clash of claims that went into the controversy, the surviving claim is the one that is vindicated by the settlement. Thus the winning claim is the one that international law should absorb and perpetuate. In the hydrogen bomb example, the norm that characterized the settlement is that the use of the oceans for weapons tests is, at least, governed by a liability rule: the testing state is strictly liable for injuries resulting from the tests. Even though this rule grew out of a single incident, it becomes a firm rule of customary international law.\(^8^9\)

Over the centuries, a common kind of settlement has been by treaty. The two or more contending parties sign a treaty that settles their past disputes and often provides rules for avoiding future similar disputes. The suggestion was made forty years ago that settlements incorporated into a treaty are just as much the practice of states as settlements

\(^{88}\) The reasoning here is similar to the argument made below that the so-called persistent objector rule cannot be tolerated by the ILS.

\(^{89}\) Similarly, earth-orbiting satellites created ‘instant custom’ according to the classic article by Bin Cheng, United Nations Resolutions on Outer Space: ‘Instant’ International Customary Law?, 5 Indian J. Int’l L. 23 (1965).
reached by other means. The settlements themselves, and the norms that governed them, are stored in the database of the ILS (to be retrieved for future processing of inputs).

The foregoing arguments require modification of the top of the decision tree of Figure 1, as follows:

**Figure 3. Add to top of decision tree:**

```
Real-world environment
    |
    |
    claim
    |
    |
counter-claim
    |
    no objection
    |
    stop
settlement (if any)
    |
    |
    INPUT
    ↓
(goto top of Figure 1)
```

**III. Bias Filters**

Once the ILS is accessed, the input passes through a ‘bias filter,’ which ‘tags’ the input with a rebuttable presumption. The filter does not reject any portion of the input; rather, it assigns to each input a rebuttable presumption that stays with the input through the internal canalizing processes of the ILS. If the presumption is not rebutted in the canalization, it becomes outcome-determinative.

The bias filter is conceptually close to Lon L. Fuller’s eight internal principles of law. The idea of the rule of law, Fuller argued, would de-

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90 See *Anthony D’Amato*, Treaties as a Source of General Rules of International Law, 3 Harv. Int’l L. J. 1 (1962). This suggestion has not been disputed in the international law literature, assuming it has been noticed.
feat itself if it violated certain internal structural norms. Fuller did not specify whether the violation of one or more of the eight principles would constitute a theoretical or a practical obstacle to the rule of law. That question, which is of importance in understanding Fuller’s jurisprudence, becomes unimportant when we adopt a systemic perspective and view every legal claim as being more or less biased either toward order or anarchy. This approach avoids imposing rigid or formalistic categories upon the legal discourse in the noosphere, and instead views the process of legality in operational terms. The ILS views each claim, event, incident, and controversy in light of its tendency either to produce order or anarchy.

The bias filter may usefully be broken down into a series of four filters, which may be depicted at the top of the decision tree in Figure 1 as follows:

**Figure 4.** Expansion of top of decision tree of Figure 1.

```
Illegal?
   /\  \\
  |  self-preservation filter
   \/
   |  equality filter
   \/
   |  reciprocity filter
   \/
   |  interdependence filter
   \/
   Search database
```

Each of these filters derives from the system’s goal of self-preservation. The equality filter and the reciprocity filter are ‘hardened’ manifestations of the goal – that is, international law over time has so frequently

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91 See Lon L. Fuller, The Morality of Law, 53-94 (rev. ed. 1964). The structural norms, which Fuller somewhat misleadingly called the “internal morality of law,” are: generality, promulgation, non-retroactivity, clarity, non-contradiction, not requiring the impossible, consistency over time, and congruence between rule and official action.
invalidated norms grounded in inequality or non-reciprocity that such norms are now almost automatically rejected as subversive of the system’s self-preservation. A less hardened filter is the system’s preference for interdependence-producing rules as opposed to independence-producing rules.

A. System-Perpetuation Filter

1. Application

Whatever the content of the rules in its database might be, an autopoietic legal system will initially be biased against any claim that it regards as anarchy-producing. The reason is that an anarchy-producing claim, if accepted, will interfere with the system’s overriding goal of self-preservation. As a recurring illustration, let us consider the fate of Claim N as it might be inputted into the ILS:

Claim N: State N asserts an exclusive right under international law to invade by military force, in its sole discretion, any other state or states.

Naturally such a claim appears absurd in the light of present-day international law. However, the ILS does not ‘look ahead’ to review the international norms in its database, so the substantive absurdity of the claim is not yet ‘known’ to the system. Instead, at this initial step in its decision tree, the ILS is only considering the filtering mechanism.

The system-perpetuation filter would tag Claim N as presumptively anarchy-producing. It would find that an unbounded claim such as Claim N tends to substitute power for law. To be sure, State N might ‘get away with it,’ as Rome did at the height of the Roman Empire. But that would be for reasons of power and not law. So long as all other states were subservient to Rome, there could be no ‘international law’ during the era of the Roman Empire. But it was also incorrect to refer to those territories within the Roman Empire as ‘states.’ They were simply territories under Roman rule.

Hence Claim N tends to undermine the idea of ‘states’ as subjects of international law. There is no reason that the ILS should acquiesce in this

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92 This is not to say that certain steps toward international law did not occur. For example, the *ius gentium* could be regarded as a proto-international law. For further discussion of this aspect of *ius gentium*, see D’Amato, Concept of Custom at 237-40.
assertion of power by state N. If it is forced to acquiesce – i.e., N is so powerful that all the other states have no choice but to submit to N’s power – that would signal the end of the international legal system. Yet the ILS does not reject Claim N at the outset; it only tags it as presumptively anarchy-producing. As Claim N proceeds through the canalization process of the ILS, the presumption will either be refuted or will be allowed to stand and hence become outcome-determinative.

2. Analysis

The overriding purpose that we attribute to all autopoietic systems is their self-perpetuation. This same attribution has explanatory and heuristic value when we deal with conceptual systems such as the ILS. Animals, plants, and micro-organisms are systems whose purpose (even in organisms too small to have a brain) act as if they want to survive.93 They accomplish this either by fission (a bacterium today, or a grain of wheat, contain the same DNA as the original bacterium or wheat germ of millions of years ago), or by sexual reproduction (where just the instructional template – genes and chromosomes – is inherited, half from each parent). An assumption cutting across all applications of general

93 This statement is almost but not quite tautological. The reason it is almost a tautology is that we would probably not be interested in biological systems that appeared momentarily only to perish. Indeed, we could hardly call them – or have enough time to call them – “systems.” The biological systems that are interesting to us are just those that have managed to endure for at least a significant period of time – by reproduction, by fission (as in the case of amoebas), or just by various survival mechanisms that prolong their future (as in the case of successful political entities). They are interesting because they are the survivors of the Darwinian struggle; they are here, the failed ones are extinct. A system is not necessarily aware of the imperative of survival. A system may be unconscious – an example is genes. See Richard Dawkins, The Selfish Gene (1976). In their case we simply infer a “blind” goal of survival based on the evidence that the successful genes are those that have managed to locate themselves in carriers (such as human beings) who are successful reproducers. If a human being is just a gene’s way of reproducing itself, nevertheless the luckier genes are those who happen to choose those humans who make a conscious effort to survive – at least, to survive to the point of reproduction. See Mark Ridley, Evolution (1993); compare Susan Oyama, Evolution’s Eye (2000). The genes associated with these successful humans are the ones that persist. (To be sure, some physicists use the term ‘system’ to apply to simple entities, such as muons, that have an extremely transient existence; the usage in the present article refers to complex systems, such as biological systems.)
systems theory is that the ‘purpose’ of biological systems and heuristically-useful conceptual systems is self-perpetuation.\footnote{See Purposive Systems (\textit{Von Foerster} et al., eds. 1968).} A system that ‘strives’ to perpetuate itself through time supplies a purposive dimension to the self-organized collection of interacting elements, linking those elements in a meaningful way. Indeed, system and survival are recursively joined; it is difficult to imagine calling something a system if self-perpetuation is not one of its main attributes.

This is not to say that the system must be consciously aware of such a purpose, as Erwin Schrödinger pointed out in 1944 in his classic \textit{What is Life?}\footnote{\textit{Erwin Schrödinger}, \textit{What is Life? The Physical Aspect of the Living Cell} (1967).} Much less is it to claim, as H.L.A. Hart did, that self-perpetuation is a \textit{moral} imperative.\footnote{See \textit{Hart}, Concept of Law, at 193-200. If survival were a moral imperative, then a tyrant would be morally justified in murdering everyone whom he suspected of being a potential plotter against his life, even if the number were in the millions.} Humans, and perhaps chimpanzees and whales, have a sense of self-awareness and mortality, which they may have evolved in order to increase their chances of survival.\footnote{See \textit{Julian Paul Keenan}, \textit{The Face in the Mirror}, 235-46 (2003).} But most of the animal kingdom, and all plants – and genes, if we discard the interesting though misleading characterization of Dawkins that they are “selfish”\footnote{See \textit{Richard Dawkins}, \textit{The Selfish Gene} (1976).} – exhibit self-perpetuating behaviour even though they may lack self-awareness. Schrödinger characterizes the phenomenon of life in terms that are more scientifically neutral: “living matter evades the decay to equilibrium.”\footnote{\textit{Schrödinger}, \textit{op. cit.} n. 95 \textit{supra}, at 85.} Yet even his use of the term “evades” incorporates a purposive component. This was undoubtedly intentional; Schrödinger’s conclusion is that the tools of the physicist are not (yet) advanced enough to understand how living matter can be more than the sum of its molecular parts. In short, self-awareness (a first-person phenomenon) may be difficult to view from the outside (from the third-person viewpoint). But even short of self-awareness, biological systems are self-referential. Their behaviour manifests an awareness of their internal mechanism and its efficient employment in the battle for survival.

The opposite of self-perpetuation for biological systems is death. The opposite of order is chaos. In legal systems, ‘anarchy’ is a more appro-
priate term than 'chaos.' Thus we may say that the opposite of self-perpetuation for a legal system is anarchy. In a state of anarchy where order, authority, and legitimacy have broken down, the legal system is destroyed. Anarchy is the state in which law does not exist. Although a period of anarchy may (or may not) be followed by a new legal order, there is no guarantee that the new order, if it arrives, will be a restoration of the previous one.\textsuperscript{100} Hence, from the point of view of an existing legal system, anarchy is death.\textsuperscript{101}

Not only must a legal system avoid anarchy in order to survive, but it must also anticipate the possibility of anarchy and accordingly reject any putative new rule if it has anarchic tendencies. Thus the task of the first filter is to accept claims that are order-producing (system stabilizing) and add to the weight of their rebuttal the claims that are anarchy-producing.

As Darwin showed, biological systems adapt to their environment in order to survive. But they also attempt to change their environment to make it more livable. Humans especially have wrought huge changes in the natural environment to make it more friendly to human survival. The internal wiring of the ILS reflects long-term adaptation to the norms that have succeeded in reducing inter-subject conflicts. But at the same time, the ILS interferes with its environment by weeding out other anarchy-producing norms. In short, the ILS, like any system, both shapes and is shaped by its environment.

The main reason why autopoiesis modelling can usefully be applied to social systems is that the attribution of self-reference and self-perpetuation to such systems can be powerfully explanatory of the system's behaviour — even apart from the question of whether the system

\textsuperscript{100} However, a new legal system following a political revolution or other period of anarchy may be biased in favour of replicating the previous system. The reason is that the subjects of the previous system (people, organizations, etc.) remember that previous system and are more likely to favour its re-emergence — especially in fundamental areas of law like family law and property law — than to accept a new and strange legal order.

\textsuperscript{101} Anarchy is not the only cause of death of a legal system. A legal system can also come to an end if it is absorbed by another legal system through conquest, merger, or replacement by a new legal order. An example of the latter is the expiration of the legal system under Articles of Confederation in 1787 upon its replacement by a new Constitution.
in fact is self-aware. \(^{102}\) We may therefore posit that the ILS, when notified of a claim of legality or illegality, will be biased toward accepting the claim that perpetuates the ILS itself and rejecting the claim that could lead to anarchy (or in Schrödinger’s term, ‘decay’). Thus, the first step in the filtering process is for the ILS to examine the substantive content of the claim to see whether it is presumptively legal or presumptively illegal. As the decision-tree shows, this initial step does not settle the question. It would settle it if it were the very first claim that the ILS had ever encountered. But in five thousand years of evolution, the ILS has amassed a rich databank of previous claims and how they were coded. A new input that is inconsistent with this historical record is nearly always rejected, just as a plaintiff’s claim in a domestic court will be rejected if it contradicts precedent. To be sure, once in a while a court will accept a claim inconsistent with precedent by overruling the precedent. For the ILS to do this would require an exceptionally strong showing that the new input must be more stability-producing than the norms closely connected to it in the existing databank. The system’s internal mechanism for ensuring that the showing is exceptionally strong is simply the requirement that a considerable expenditure of energy is needed in order to review all the rules in the databank. Another way to look at this is to say that the law of conservation of energy tends to favour existing norms in the databank over new claims because the new claims would require an additional expenditure of energy in modifying or overturning some (or many) of the existing norms. All legal systems, not just the ILS, are biased (perhaps for just this reason of conservation of energy) in favour of retaining existing rules irrespective of their content. Law is by its very nature conservative.

\(^{102}\) Consciousness and self-awareness are not necessarily equivalent. Dr. Keenan defines self-awareness as “the ability to reflect on one’s own mental state and the capacity to regard the self as a different entity from others.” Julian Paul Keenan, The Face in the Mirror 5 (2003). A less restrictive definition of self-awareness is the ability to detect and respond to changes in one’s internal state. Anil Buntwal Somayaji, Operating System Stability and Security Through Process Homeostasis, 1 (2002), at <www.cs.unm.edu/~immsec/publications/soma-diss.pdf>. The latter definition would include many biological organisms, but so far does not include computers (although new programs are being developed to enable computers to respond to data corruption, program crashes, and security violations in their own internal systems). However, the ILS, as an artificial autopoietic system constructed by humans and for humans, is self-aware.
When the input to the ILS consists of conflicting claims that were already settled in the real world, the fact of the settlement goes a long way toward tagging the prevailing claim as stability-producing. For international order itself is nothing more than a successful series of peaceful settlements over a given time period. It is precisely in this sense that customary international law arises. Customary law consists of the successful resolution of conflicts of claims in the actual practice of states (and other subjects of international law). We shall return to the topic of customary international law in the section below on third-level grammatical rules.

B. Equality Filter

1. Application

Perhaps the first thing about Claim N that would occur to a layperson as well as to a legal expert is that, by giving state N an unfair legal privilege over all the other states, it violates the principle of equality. Accordingly, the second filter would tag Claim N with a strong presumption of producing anarchy. A more realistic example is a claim actually asserted in 1954 by Myres McDougal:

Claim M: The United States, but not the Soviet Union, may legally test nuclear weapons in the South Pacific, because the United States represents the free world.\footnote{Myres McDougal et al., Studies in World Public Order, 771 (1960). McDougal refers explicitly to the “free world society” at 812, the “free world” at 843, and the distinction between “the free and the totalitarian worlds” at 814.}

It is notable that despite the xenophobia of the mid-1950s, the State Department never espoused Claim M. Indeed, one can hardly imagine an American diplomat trying to convince a foreign diplomat that international law does not apply to the United States when certain issues are at stake that are very important to U.S. interests.

2. Analysis

It is not conceptually impossible for a legal system to apply its rules unequally. In some fundamentalist states today, Shari’a law accords a probative value to a woman’s testimony in court as one-half the value of a
man's testimony. The result is that in every case involving one man and one woman (for example, divorce or battery), the man wins. But a system like that must constantly be maintained by force. It is unstable on its own; it needs to be propped up by male police and male judges. It may lack the power of legitimacy in the minds of at least half its subject population. The same is true of the treatment of the 'untouchables' in India: the law treats them as unequal, but this puts a strain on the law that will eventually lead to legal reform.

But neither legitimacy, fairness, justice, nor morality are filters for the ILS.

Vitoria's concept of 'just wars' was an attempt to add a justice filter to the ILS, but the lack of objective criteria for a 'just war' immobilized the concept at its inception. The filter called 'equality' is not premised upon moral values. Instead, it is a filter within the ILS because history has shown that inequality under law leads to anarchy. As a thought experiment, suppose that a world legislature is proposed with the power to make international law. If each state were given one representative to this legislative body, the major powers in the world certainly would turn the proposal down.\(^{104}\) Suppose instead that votes were allocated according to military power. Would every shift in power result in a change in the allocation of votes? Would some states be tempted to destroy the armaments of other states in order to change the allocation of votes? Would states engage in an arms race to get more votes? Hitler forecast the Third Reich as standing for a thousand years; it lasted one per cent of that time. At the height of his military power, should the ILS have given Hitler additional international law-making power?

\(^{104}\) Similarly unpalatable to the great powers would be the Clark/Sohn proposal of 1960 allocating votes according to population. See Grenville Clark/Louis B. Sohn, World Peace Through World Law, 16–29 (2d ed. 1960). Under their proposal, China, India, USSR, and US would each get 30 votes in the world legislature; Pakistan, Japan, Indonesia, Brazil, Germany, UK, Italy, and France would each get 15 votes; and the next levels of votes would be 6 (Argentina, Cambodia, and Ghana among others), 4 (Sweden and Belgium among others), 2 (Norway and Paraguay among others), and 1 (the smallest states). A main problem with the Clark/Sohn proposal is that as new states are formed, they will at least get 1 vote and perhaps more. In 1960 there were 99 states, but in 2003 there are 190. The 'new state bloc' of today would have a combined total of over 90 votes which would surpass the votes of three of the top four powers. This is one of the many factors that would lead the developed nations to reject a world legislature.
As a general proposition, if lawmakers tracks power, then law becomes functionally equivalent to power. In that event it is no longer law; it is simply the rule of the mighty. The ILS will have ceased to exist.

Thus, the 'equality' filter is ultimately justified in terms of the need of the ILS to perpetuate itself. Although in this sense it might be considered superfluous, the first filter - system-perpetuation - may sometimes be difficult to apply to a given claim. The second filter - equality - may be a lot more obvious and helpful with respect to that claim. Hence over time equality may be said to have congealed into a stand-alone filter within the internal canalization process of the ILS.

3. The Persistent Objector

The persistent objector doctrine - that if one or more states object persistently to the formation of a nascent rule of customary law, then the rule, if and when formed, cannot be applied against them¹⁰⁵ - is very useful to examine for the purpose of exploring the ILS model. Hence more attention is given to it here as an example of larger issues than perhaps its minor role as an international law doctrine would warrant.

The ILS model predicts that the doctrine of the persistent objector would be rebutted by the equality filter because it would imply that international norms be bifurcated into the rules that apply to all states and the rules that apply to all states except the persistent objectors. Consider a bilateral treaty between A and B. The treaty may exempt A and B inter se from an international customary rule, but it cannot change the law between all the other states and A or between all the other states and B.¹⁰⁶ By contrast, the persistent objector doctrine unilaterally attempts to change rules between all the other states and the persistent objector.¹⁰⁷ It purports to give to a single state a privilege that even a treaty involving two or more states cannot provide.


¹⁰⁶ Apart from its effect on general customary international law.

¹⁰⁷ This is not to say that a state's persistent objection to a nascent customary rule can never have an effect. It might very well have the effect of preventing the
The main reason for predicting that the ILS will reject the doctrine of the persistent objector is that it would undermine the role of the ILS and hence jeopardize its self-perpetuation. For it is the ILS that creates rules of international law, and not any individual state. By the same token, an individual state is powerless to create an exception to the rules of international law. Exceptionalism entails anarchy.

Exploring this issue on a deeper level, we see that something is wrong with the formulation of the doctrine. The doctrine claims to exempt the persistent objector from a discrete and particular rule that is in the process of becoming customary law. But, given the ILS, there is no such thing as a discrete and particular rule; all the norms of international law are interconnected. They are interconnected because they all bear the mark of the same internal machinery of the ILS through which they were processed, and because in the course of the processing they were compared to and modified by other rules in the database. The array of norms in international law is like a rugged fitness landscape. Each peak on the three-dimensional landscape represents a norm. There are intermediate peaks around the tallest peaks that represent nearby norms. The heights of the peaks are a rough measure of the importance and frequency of the norms. The depth of the valleys between peaks represents the conceptual distance between norms. If one peak were demolished — that is, if the doctrine of the persistent objector were to be actualized — all the measurements of the other peaks and valleys would rule from being created at all. Every subject of international law, not just persistent objectors, has a role in the formation of international norms.

The invocation of opinio juris in discussions of customary-law formation constitutes a similar category mistake. Opinio juris erroneously suggests that international law proceeds from the will of the acting state. It looks to the psychology of the actor in an attempt to determine its feelings about whether an act is legal or illegal. But only the ILS makes international law (in the interest of peace for all states and for itself). Any attempt to include opinio juris in the ILS would clearly beg the question that the ILS is in the business of solving.

A simple example: a thief cannot opt out of the domestic legal system in order to rob a bank. If he could, then every would-be criminal or reluctant taxpayer would create personal exemptions.

Fitness landscapes are discussed in Stuart Kauffman, At Home in the Universe, 169-80 (1995); for rugged fitness landscapes, see id. at 180-89.

For example, the right to clothing and the right to minimal shelter are peaks that are close together; they are several valleys away from the right of jurisdiction of flag states on the high seas.
be affected. The values of nearby norms would be compromised, and there would be a rippling effect across distant norms. It is even possible that inconsistencies might arise: for example, the existence of a rule that affects all states except the persistent objector might clash, in respect of the persistent objector, with other nearby rules that affect all states including the persistent objector.

To state the matter differently, the removal of a norm from the fitness landscape would contradict the original assumption of the persistent-objector doctrine that the objector can escape from a particular rule and yet leave intact the remainder of its international-law obligations.\footnote{This reasoning is similar to resolving the paradox of Schrödinger's cat, a cat that is both alive and dead when the quantum wave-function collapses. For a description of the thought experiment and its long history in quantum mechanics, see John Gribbin, In Search of Schrödinger's Cat: Quantum Physics and Reality (1984). This 'paradox' however, fails if one considers that the live cat, standing in the experimental contraption, has a different gravitational effect than a cat lying down. Hence the space-time manifold in the vicinity of a live/dead cat would require an indefinite metrical structure. This contradicts the original assumption of a determinate experiment. See Tim Maudlin, Quantum Non-Locality and Relativity (2d ed. 2002). In short, like the persistent-objector doctrine, the background considerations cannot be held constant.}

C. Reciprocity Filter

The concept of reciprocity, like equality, has become deeply embedded in international law. Claim M made no headway in the international community in large part because it denied the applicability of reciprocity. To assert that international law gives the United States a special privilege that it does not give to the Soviet Union is to allow the United States to take action against the interests of the Soviet Union while forbidding the Soviet Union to take similar action against the interests of the United States.

The reason for the reciprocity filter is not that it is a moral imperative (Kant's Golden Rule), but that it tends to create order in the world. The denial of reciprocity leads to anarchy as states carve out special privileges for themselves that they wish to deny to their intended victims. In this and other respects, the reasons previously given in support of the equality filter apply, mutatis mutandis, to the reciprocity filter.
D. Independence Filter

The fourth filter imparts a bias in favour of interdependence-producing rules as opposed to independence-producing rules. The presumption is weak and of course rebuttable, yet to exclude it from the ILS would render the ILS model less accurate in its depiction of the inner machinery of the international law process.

The interdependence filter appears counterintuitive. If the ILS seeks to perpetuate itself, then wouldn’t a reduction in real-world ‘friction’ reduce the occasions for convulsion and anarchy? At the limit, if states were cordoned off from each other so that there was no interaction among them at all, then the assemblage of states would be frictionless and there would be world peace and stability among states (except of course for what goes on inside the states). Thus the reciprocity filter presupposes interacting states. However, the consequence would be that the ILS itself would be simple and unstable. In a world of isolated states, it would have very little work to do. Moreover, war could still break out, removing the cordons by physical force (the way the wall being constructed by Israel could be breached in the event of a war with the Palestinians). In that case the ILS would simply cease to exist; instead of international law there would be anarchy.

As previously noted, the ILS, like all systems, increases in stability the more complex it becomes. Interactions among states breed complexity. To take an important illustration, there was a time in ancient history when a rule might or might not have taken hold in international – or intertribal – relations: the rule of nationality. Let us refer to it as rule $T$, and refer to its opposite as rule $-T$. The latter, Rule $-T$, might be thought of as a chameleon principle: a person crossing an international frontier would lose her former colorization and take on the colour of the nation she has just entered. In other words, she would lose whatever rights she had in the state she had just left, and become subject to all the laws of the state she has just entered just like any other person living in that state. The chameleon principle would operate with equality and reciprocity everywhere, so that a given state would have no spe-

113 In his novel Tom Sawyer Abroad, *Mark Twain* depicted two young balloonists arguing whether they had crossed over a state line. One of them contended that since the map they were holding showed the state below them to be coloured green, they must still hovering over that same state, whereas when they reached the border the ground below would change to pink.
cial obligations to aliens in its territory and at the same time would assert no rights on behalf of its own citizens travelling abroad.

By contrast, a nationality principle would – and did – create a great number of opportunities for inter-state conflict, such as demands for minimum standards of treatment for aliens and non-discrimination toward aliens, conflicts arising when aliens are inducted to serve in the host state's armed forces or police, problems of diplomatic protection of aliens, claims of denial of justice, and all kinds of conflicts of laws: antitrust, labour and welfare standards, monetary regulations, taxation, and others. Disputes over these issues could – and did – lead to many wars.

Thus, in terms of the goal of stability for the ILS, why did it opt in favour of T instead of –T? The answer must be that even more wars of a more destructive nature would have occurred under rule –T. This is of course a counterfactual hypothesis, but it is supportable by the historical record.\textsuperscript{114} The primary motive for one state attacking another is greed: the predator state wants to obtain the economic wealth of the prey state by cheaper means (i.e., military means) than it would cost to replicate that economic prosperity at home. If a tribe is isolated, self-contained, and prosperous – as Canaan was in Biblical times – it will be prey to any predatory tribe that notices it. Thus it was gradually realized over time that economic isolation – autarky – would sooner or later invite invasion from abroad. The alternative strategy for a tribe or state was to increase the wealth of its neighbours on a continuous basis so that they would forego aggressive behaviour. How could this be done? What is perhaps the single most important axiom about human society provided the solution: the axiom of division of labour. This axiom yields a win-win result for the players.\textsuperscript{115} At the international level, it is called the doctrine of comparative advantage.\textsuperscript{116} Nations became richer the more they traded with other nations. If Canaan is skilled at producing milk and honey, it would have been better for its

\textsuperscript{114} Detailed historical support of this hypothesis will be provided in a forthcoming article by the present author.

\textsuperscript{115} For example, a person skilled at making shoes trades some shoes for some shirts from another person who is skilled in making shirts. Each person would be worse off if he had to make both shoes and shirts for himself. Trade enables each of them to increase his wealth. Trade is not a zero-sum game.

\textsuperscript{116} The Doctrine of Comparative Advantage, attributed to Adam Smith and David Ricardo, can on analysis be seen to be nothing more than the doctrine of division of labour applied on a national scale.
neighbours to trade with it than to destroy it. By trading with it, the would-be aggressor is able to get rid of surplus goods (like clothing) which it produces easily, and obtain a steady flow of milk and honey which it finds difficult and expensive to produce. The Canaanites, in turn, are better off by receiving the garments they desire in return for getting rid of surplus milk and honey. If the would-be aggressor instead were to destroy the milk-and-honey producer, it would be acting as in the fable of killing the goose that laid the golden eggs. To be sure, it might repopulate the farms with its own citizens, but then where would it get its clothes and how much would it have to pay? Its own population by hypothesis is more skilled at garment-weaving than at farming. In short, trade is of such overwhelming economic advantage to all nations that it actually is less expensive to engage in trade than it is to engage in aggressive warfare. It is also far less risky; a war, no matter how well calculated, could turn out to be ruinous for the aggressor.

In order to have trade, one must have traders. A trading class serves to facilitate and maximize imports and exports. A nation that sends a trader to a foreign country with surplus goods expects that trader to come back with desired goods. Rule T thus became necessary to establish a legal connection between a nation and its own traders that provided an incentive — forcible in some cases — for the trader to come back. Yet in return for coming back with the goods, a trader demanded a certain amount of protection from his home state when he went abroad — protection against robbery, confiscatory taxation, or imprisonment in the foreign country. Thus rule T was fleshed out, giving aliens various legal rights and protections in foreign territory. International law, now having to deal with cases arising out of the travel of per-

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117 Of course, tribes in Biblical times do not seem to have made such economic calculations — or if some did, all we know about them is that they lived peacefully and in doing so provided no interesting stories to be handed down to future generations.

118 Statistics compiled by the present author, to be detailed in a forthcoming article, will show that nations engage in war for less than 2% of their average lifetimes; peace is the overwhelming real-world preference at over 98%. Moreover, the figure of 2% has been decreasing sharply over the past few decades.

119 In the early days of the T rule, nations were reluctant to risk war to go to the assistance of their traders abroad. But if they did nothing, the traders would have no motive to come home. The result was an ingenious compromise: to give the trader a letter of marque or reprisal, enabling the trader to use his own military resources to protect himself and his assets in enemy territory. A historical account of this development is forthcoming in an article by the present author.
sons, became more complex, more detailed, and more salient in international intercourse. The ILS, itself becoming more salient and secure, never cut back on the nationality principle but in fact extended it. Today's human-rights law had its beginning in rule T. Although even today adding persons wholesale to the list of subjects of the ILS would vastly complicate its task, systems theory and network theory tell us that the ILS will move in the direction of adding to its subjects. Despite what superficially might appear to be increasing world friction arising from claimed human-rights violations, the ILS is getting stronger over time and becoming increasingly secure of its self-preservation.

IV. The Grammar of the ILS

At this point in our journey through the mechanism of the ILS, the ILS has processed externally communicated claims through its four filters and is now about to search its database. The database itself is a history of processed communications organized according to qualitative type. We need to examine briefly the idea of law as communication, and then turn to the three basic types of communications which we shall call the 'grammar' of the system: first-, second-, and third-level rules.

Hans Kelsen in 1934 was the first legal philosopher to propose that law consists of inter-communications among law-makers (usually legislatures), the police (the sanctioning officials), and the public.\(^{120}\) Departing from his positivist predecessors Jeremy Bentham and John Austin who viewed a legal norm as a command, Kelsen found the essence of a legal norm in the more operational conditional statement "If you choose to do X, then the state will do Y to you."\(^{121}\) For example, if you rob a bank, then the police will arrest and imprison you. Thus under Kelsen's reductionist view you are not commanded to refrain from robbing banks; you are only told that if you decide to exercise your free will and rob a bank, you can expect the state to take certain coercive acts against

\(^{120}\) *Hans Kelsen*, The Pure Theory of Law (1934 ed. translated in 1992 and republished as Introduction to the Problems of Legal Theory). In later refinements, Kelsen tends to omit the public as a participant in legal communications. Recent work in autopoietic theory appears to follow Kelsen in this regard, viewing legal communications as contained within a closed community of discourse.

\(^{121}\) This point is made clearer in *Hans Kelsen*, General Theory of Law and State (1949).
you. What law means to the citizen is not the norm but the sanction, and further, not the sanction but the probability of its occurring.

Kelsen’s theory accords rather well with the sovereign sensibilities of nations under international law. For international law never commands a state not to do X; rather, it first codes X as ‘illegal’ and then applies a second-level rule that specifies the sanctions that the world community will impose upon a state if it goes ahead and exercises its sovereign power affirmatively to do X. International law does not “speak” to a state in normative/moralistic terms.

The grammar of any communication centres on the verb form that drives it, for which the equivalent in Kelsen’s theory is the sanctioning norm. The norm that specifies the sanctions to be imposed upon a state that violates a rule is, in grammatical terms, the verb – the most important grammatical form. Another grammatical form, which we might regard as implicit in Kelsen’s theory, is adjectival law – the role played by Kelsen’s theory itself when it explains how the norms of a legal system are created, modified, or destroyed.

The internal mechanism of the ILS for processing the inputted communications has congealed over time into a ‘grammar’ for dealing separately with three different kinds of legal forms. As previously stated, the real world is only interested in one of these forms: the first-level rule that is coded by the ILS as illegal or not illegal. But law professionals are especially interested in the other two kinds of forms: those that prescribe sanctions and those that prescribe substantive changes. The three operate in a kind of hierarchy like that of a building, with first-level rules on the ground floor. They may be summarized as follows:

122 Under Kelsen’s pure theory of law, rules that provide sanctions are more important than primary rules directed at citizens, for unless there are sanctions no citizen would have an incentive to obey the primary rules. See Hans Kelsen, General Theory of Law and State, 53-56 (1949). Kelsen rules out morality as a sanction, consigning it to the extra-legal realm of social metaphysics. For further explication of Kelsen’s argument, see Anthony D’Amato, Analytic Jurisprudence Anthology, 50-55 (1996).

123 It became explicit in a later book. See Hans Kelsen, Principles of International Law (1952). However, the use of the term “principles” for what are called third-level rules in the present Article would be confusing here.

124 Cf. Hart, Concept of Law, at 92, dividing rules into primary and secondary rules but omitting the sanctioning rules. Hart’s “primary rules” are called first-level rules in the present Article; his “secondary rules” are called third-level rules.
(1) First-level rules that are addressed to persons or entities subject to the law (‘nouns’).\(^{125}\)

(2) Second-level rules that specify sanctions for disobeying first-level rules (‘verbs’)

(3) Third-level rules that specify how to create, modify, or delete rules of the first two types (‘adjectives’ or ‘adjectival law’).

Without pushing the grammatical analogies beyond their point of usefulness, suffice it to say that as grammatical rules provide human language-users with tools for making sense out of an assortment of words, so too the grammar of the ILS sorts, prioritizes, and characterizes the three entirely different kinds of communication-inputs.

A. The Three Grammatical Forms

1. First-Level Norms

Although the norms that apply to the subjects of international law make up the bulk of the treatises and textbooks on international law, in this Article they take up the least amount of space. There are literally hundreds of thousands of established norms and putative norms covering the vast range of the jurisdiction of international law: from the clashes of state jurisdiction in foreign territories, to the oceans, ocean floor, airspace, outer space, celestial bodies, and the polar regions, to the global ecological system, to the rights of persons and groups and the prosecution of international crimes, to the global market and international organizations, and to the regulation of military force.

(a) Rules

The norms referred to in the preceding paragraph may be called ‘rules’ if they take the form of commands or injunctions addressed to subjects of international law to take certain actions or refrain from taking certain

\(^{125}\) Hart called these first-level rules “primary rules” — those rules under which subjects “are required to do or abstain from certain actions, whether they wish to or not.” *Hart*, Concept of Law, at 78-79.
actions.\textsuperscript{126} They may be called ‘principles’ if they appear to assign weights to various alternative courses of action.\textsuperscript{127}

(b) Entitlements

Since the rules of international law apply equally to all states, it follows that all states have the same legal rights. Because of the ambiguity of the term ‘rights’ especially when translated into other languages, it may be preferable to use the term ‘entitlements’ as synonymous with ‘legal rights.’

When a nation is born, the ILS assigns to it a fixed set of entitlements. The most important is the entitlement of statehood itself. The new nation is given legally inviolable borders.\textsuperscript{128} Within those borders it is entitled to exert its own legal jurisdiction; and it may send ambassadors to other states and receive their ambassadors. This first set of legal entitlements is so close to the meaning of the term ‘state’ – indeed, it amounts to the juridical meaning – that no state in recorded history has opted to become an outlaw from the ILS. The cost of outlawry would be that its own boundaries would not be legally recognized by other states – an issue so vital to the state’s identity that no state has seriously entertained rejecting the ILS \textit{in toto}. (There are of course other reasons for a state’s acceptance of the package of international norms in the ILS; one of

\textsuperscript{126} Of course, this is the form only in ordinary language. In Kelsen’s more precise theory, it is the second-level rule that is important because it specifies the coercive act that will probably accompany the violation of the first-level rule.

\textsuperscript{127} The distinction was classically drawn by Dworkin. See \textit{Ronald Dworkin}, Taking Rights Seriously, ch. 1 (1978). Although the distinction is clear enough in ordinary language, it is less perspicuous when analyzed. For example, a rule may apply ‘obliquely’ instead of ‘head-on’ to an issue, in which case we might interpret the rule as a principle.

\textsuperscript{128} The legal inviolability of boundaries is so fundamental that the Vienna Convention on the Law of Treaties specifically excepts boundary-establishing treaties from the normal rules of rebus sic stantibus; see Vienna Convention on the Law of Treaties, Art. 62, adopted May 12, 1969, 8 I.L.M., 679, 702 (1969). Similarly, the World Court has held that the continental shelf is an extension of a nation’s land mass and thus belongs to the package of a nation’s sovereign entitlements. North Sea Continental Shelf Cases (\textit{W. Ger. v. Den.}, \textit{W. Ger. v. Neth.}), 1969 ICJ 3.
them, as we shall see, is that the contents of the package are ‘friendly’ to
the aggregate interests of the states.)

Other entitlements in the package include the entitlement to enter into
binding treaties with other nations, to have the treaties construed and
applied according to customary international law, to freely navigate the
high seas, to send communications satellites into orbit, to mine the
ocean floor (subject to limited constraints set forth in the Law of the
Sea Convention), to fish in its exclusive economic zone of 200 miles
from its coast (if it is a coastal state), to espouse the claims of its nation-
als abroad, to take advantage of the laws of war and neutrality, to ex-
tend its police jurisdiction to counterfeiters of its currency operating
abroad, to be entitled to navigation rights on international rivers, to be
able to extend asylum to international political refugees, to seek extrad-
tion of its nationals arrested abroad (even in the absence of a formal
treaty of extradition), and many thousands more that can be found in
international textbooks. A fair legal description of a state is that it is a
bundle of entitlements.

2. Second-Level Norms

a. Analysis

It is perhaps a failure of scholars and other international-law profes-
sionals to tend to overlook sanction-rules (second-level norms) while
concentrating on substantive rules (first-level norms). This is like speak-
ing in nouns and omitting verbs. 129 Nouns may be more interesting, but
verbs bring them to life. The classic publicists were even more guilty of
noun-speaking than writers today: they virtually ignored sanction rules
entirely. 130 They may perhaps be excused because they tended to view

129 Teubner deals with sanctions by separating them from the legal system.
“Legal communications reliably motivate only legal communications.” Teub-
ner, Law, 91. Thus, to “motivate general social communication,” resort must be
had to external processes “such as moral pressure, persuasion as to the rightness
of the law, and above all through sanctions, the use of power based on force.”
Ibid. This separation of norm from sanction would appear to render all of law a
Platonic form. It ignores the occasional resistance of the physical world to the
legal norms and the evolved strategy of the legal system to take that resistance
into account in formulating norms.

130 Only Vittoria seemed to be concerned with punishments for violations of
international law; his punishment, of course, was the waging of a just war (or
war of restitution).
international norms as moral norms. By morally normatizing norms, they felt that stating the norms was sufficient; it was up to government officials everywhere to obey them just as they would obey any moral imperatives.

But there is no ‘moral filter’ in the ILS. This is another way of saying that legal norms are not inherently moral or immoral. Lon Fuller’s valiant (or quixotic) attempt to show that legality is necessarily connected with morality\(^{131}\) was demolished rather thoroughly by H.L.A. Hart.\(^{132}\) No one would assert, for example, that there is any moral ‘ought’ connected with the Nuremberg sterilization legislation of the Third Reich.

If law is not connected to morality, then there is only one reason for taking an interest in law (apart from having a strange kind of curiosity). It is the purely prudential reason that disobeying the law can lead to physical punishment or deprivation. A legal rule then becomes a tool for predicting official behaviour.\(^{133}\) Officials, in turn, will try not to deviate from the rules when meting out punishments because their own power will diminish to the extent that their behaviour is unpredictable.\(^{134}\)

Since international law lacks a police force or other enforcement agency,\(^{135}\) the sanctions for its violation are in the hands of the subjects themselves. The customary international law of treaties has recognized


\(^{133}\) Even the official can determine the content of the rule by predicting official behaviour. Although Hart regarded this as an insuperable paradox, a solution of the paradox was offered in D’Amato, Legal Realism, 495-502. The argument is extendable to the present Article: a judge on an international court can look at a case from the viewpoint of the ILS without acting inconsistently with the fact that she, as a judge, is a participant in the ILS.

\(^{134}\) Id. at 469-71, arguing that the personal power of judges increases with the degree of order in a society. By fulfilling popular expectations about what they will decide, the prestige and power of the judge increases. If, on the contrary, there is increasing anarchy (including anarchy’s inevitable disrespect for law), judges will be viewed as reactionary people who are trying for selfish reasons to uphold the discredited status quo. Thus, the judge whose decisions are unpredictable is injecting instability to the society, making people less sure of their rights and less willing to respect the rights of others.

\(^{135}\) The U.N. Security Council is an enforcement agency but not for international law; it enforces peace.
from the earliest days of treaty-making that the breach of a material provision of the treaty by one party releases the other party or parties from their obligations under the treaty. This rule operates as a sanction rule: the penalty for breach of treaty is to take away the treaty rights of the breaching party. The ILS suffers no real loss from the expiration of a treaty for the parties did not have to enter into the treaty in the first place.

But when it comes to norms of customary international law, the ILS needs to adopt an approach that protects those norms. By protecting the norms, the ILS furthers its goal of self-preservation. Accordingly, the tit-for-tat rule of breaches of treaty would be misplaced in the customary-law context. (If state A dislikes X – a rule of customary law – and wishes to violate it, A would not be deterred if state B threatened to violate rule X in retaliation. A would presumably be quite content to see rule X eliminated for everyone by having everyone violate it at will.) Thus a rather entrenched second-level rule has evolved over time allowing retaliation in the form of impairing or destroying an entitlement by state A that state A would like to preserve. The details and mechanism of 'tit-for-a-different-tat' are spelled out elsewhere. Second-level norms govern the time, place, manner, necessity, and proportionality of the sanctions-response. The purpose of the sanctions-response is to respond to, counter, correct, deter, or punish the acting state for its violation of a first-level norm. Second-level rules specify the coercive imposition of costs calculated to exceed, but not by too much, the putative rule-violator’s benefits. If the sanction goes too far

136 For example, a state wishing a 200-mile territorial sea might not only violate the current 12-mile rule itself, but would be happy to see all other states violate it so that the new rule will set a limit of greater than 12 miles.


139 “Systemic equilibrium is best maintained if enforcement measures are proportional to the severity of the violation of the primary rules. If enforce-
(for example, excessive and unnecessary punishment), it can become a first-level violation of its own. From the viewpoint of the subjects of international law who impose a sanction against a norm-violator, the purpose of the sanction is to punish the violator and to deter other subjects from violating the norm in the future. But they also hold a wild card – their political reasons for punishing the violator. In contrast, there is only one goal for the ILS, namely, to protect its first-level rules. This purpose is not usually at odds with the three above-named purposes of the sanctioning states.

However, the jurisprudence of second-level rules is still in its infancy. Although there are probably as many instances of the successful imposition of sanctions over the past five thousand years as there are ‘incidents,’ the sanctioning data has yet to be retrieved. The records of these sanctions are largely preserved in national archives. There is data enough sitting there for hundreds of future Ph.D. dissertations.

b. Norms That Lack Sanctions

Imagine a statute making it illegal to download music from the internet which goes on to provide: “This statute shall not be enforced.” Although some scholars might wish to speculate whether or not such a statute is ‘law,’ the public would be unimpressed – they would regard the statute as just another reason why legislators are overpaid. As argued above, since there is no moral reason to obey any statute, the only reason counselling obedience is that of prudence: a person does not want to be sanctioned by the state. If there is no sanction, then the statute is in practice (not necessarily in logic) legally meaningless. In Kel-

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140 A lesson learned by history, if not by law, was the excessively punitive Versailles Treaty at the end of the first world war. Its terms gave Hitler a justification for his rearmament program. The lesson seemed to be learned at the end of the second world war, when despite the Allied demand for and receipt of ‘unconditional surrender,’ the peace terms were designed to give Germany room to rebuild.
sen's view, as we have seen, there is no legal norm at all if there is no accompanying threat of a coercive act. It is therefore safe to predict that the ILS would decline to process a claim that appears to be a legal claim but makes no provision for action or enforcement – a first-level claim with no connected second-level norm.

Such a first-level claim was incorporated in the Security Council's Resolution 487 of 1981, stating that the Council "strongly condemns the military attack by Israel in clear violation of the Charter of the United Nations and the norms of international conduct." The act in question was Israel's destruction by bombing of the Osiraq nuclear reactor in near Baghdad on the morning of June 7, 1981. But the Resolution made no mention of sanctions, punishment, reparations, or damages, thus indicating that its condemnation of Israel's action was purely precatory. The ILS would notice a lack of action by the Security Council to protect the rule that the Council was invoking. Thus there was no clash, no conflict in the real world that needed resolution. A norm entirely without sanctions is not a legal norm.

3. Third-Level Rules

Third-level rules (a better phrase in this context than 'third-level norms') that are contained within the machinery of the ILS enable it to introduce new rules of the first- and second-level type, modify or delete old rules, and "determine their incidence or control their operations." An illustration of a set of third-level rules is the provisions of the Vienna Convention on the Law of Treaties, widely accepted as forming part of customary international law. Other third-level rules of varying acceptance and force are customary international law, general principles of international law, conventional international law, and the writings of

142 The testimony of Anthony D'Amato, The Israeli Air Strike: Hearings Before the Senate Comm. on Foreign Relations, 97th Cong., 1st Sess. (1981) 85, 88, was that the Israeli strike was not illegal. See also Anthony D'Amato, Israel's Air Strike Upon the Iraqi Nuclear Reactor, 77 Am. J. Int'l L., 584 (1983); and Use of Force Against Nuclear Installations, in Anthony D'Amato, International Law: Process and Prospect 73 (2d rev. ed. (1994); and Israel's Air Strike Against the Osiraq Reactor, 10 Temple Int'l & Comp. L. J., 259 (1996).
143 Hart's text refers to metarules or secondary rules; the meaning is equivalent to 'third-level rules' as used in the present Article. Hart, Concept of Law, 79.
well-qualified publicists. There is insufficient space here to go into all their characteristics which, in any event, are well-known. Instead this Article will select three of them – custom, general principles, and *jus cogens* – to indicate how thinking about them is highlighted or modified when the ILS model is employed.\(^ {144}\) But before that, a general characteristic of the ILS model will be discussed that applies to all third-level rules – its robustness.

a. Robustness

In the earliest days of international law when the ILS may have had only a single norm in its databank – say, the norm of ambassadorial immunity\(^ {145}\) – the future of the ILS was precarious. Violation of that single norm could terminate the system and send international relations back into anarchy. Systems theorists have recognized the principle that the more complex a system is, the more likely it is to be robust. ‘Robustness’ is defined as the ability to withstand unanticipated shocks or attacks upon the system. International law has become increasingly ro-

\(^ {144}\) Some scholars say that decisions of national courts on matters involving international law constitute a source of international law. However, the decision of a national court is at best a claim made by the state to which the court is subservient. See *Karl Doehring*, The Participation of International and National Courts in the Law-Creating Process, 17 S. African YB. Int’l L., 1 (1991/92). However, decisions of national courts in cases of universal jurisdiction may soon be accorded a role in international-law formation equivalent to decisions of international courts and tribunals. Much will depend on the recognition given by other states to decisions in universal jurisdiction cases. A useful compendium on the general topic is *Luc Reydams*, Universal Jurisdiction: International and Municipal Legal Perspectives (2003).

\(^ {145}\) In a separate study nearly completed, the present author contends that the norm of ambassadorial immunity began empirically and not by any theoretico-deductive process. The reasoning may be summarized as follows. If state A sent its ambassador to state B, there was nothing to prevent state B from killing the ambassador. These murders may have occurred frequently; international law was still unknown. However, at some point, another state N might have made a qualitative leap in judgment, holding the ambassador from state M as security while sending its own ambassador to state M. Both M and N would thus have realized a Pareto-optimal gain from this kind of exchange of information. After that precedent, it was only a quantitative step forward for M and N, and then all the nations, to accept a norm of ambassadorial immunity, and from there to look for other norms that could be equally Pareto-optimal.
bust over the centuries so that today it is able to survive numerous violations of its norms and prominent challenges to their validity. As a thought experiment, suppose that every norm of international law were connected directly to the norm of ambassadorial immunity. Then a violation of ambassadorial immunity could bring down the entire system of norms. It is like imagining every airport in the United States directly connected only to the O'Hare Airport in Chicago: if you wanted to fly from Los Angeles to San Francisco, for example, you would have to fly into Chicago and fly out to San Francisco. A single hub system for airports could crash the entire system – imagine O'Hare being attacked by terrorists. Albert-László Barabási and his co-workers have shown that the more hubs there are in a network, the more robust is the network (or system). International law today, of course, has many important norms which may be regarded as hubs.

There is another quality of the ILS that leads to its robustness. Since every one of its outputs is either assigned the label 'illegal' or is given no label at all, the system may be said to be teetering on the brink of anarchy. For example, we saw that the ILS model predicts a label of 'illegal' for Claim N. But what if it made a mistake and issued no such label? The system of international law might then start to collapse because the norm against military invasion is such an important hub. The interesting counterintuitive finding of systems and networks researchers is that when a system exists at the edge of disorder (or anarchy), it is more robust than if it existed far from disorder. Proximity to disorder keeps the system in a state of high alertness, ready to fend off external attacks and building up its immunity to attack. Thus the very sim-

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146 See Albert-László Barabási, Linked: The New Science of Networks, 111-22 (2002). There are five major hubs in the US airline system: Chicago, Detroit, Denver, New York, and Dallas. Even so, the system could be made robust by adding more hubs.

147 For example, laws against interstate pollution serve as a hub for other environmental norms – note how often the Trail Smelter Arbitration is cited!

148 Stuart Kauffman, Lecture on Complex Systems, Complexity Conference, Northwestern University, October 26, 2003, describing experiments in microbiological systems.

149 A smallpox vaccination, for example, stimulates the human immunological system to developing resistance to smallpox.
plicity of the output codes of the ILS ('illegal' and no-code) adds to the robustness of the system.\textsuperscript{150}

Robustness, in turn, has a direct consequence for the application of third-level rules. The more robust the ILS, the easier it is to change or modify first- and second-level rules. Customary international law, for example, is a more ‘dynamic’ process today than it was in the past because it is more prepared to allow changes in the rules – the most notable example being the development of human-rights law. (As we saw earlier, as persons are added to the subjects of international law, the ILS becomes stronger.) Changes in first-level rules due to advances in technology are increasingly easy to tolerate as the system increases in robustness.

Changes in the old rules (via custom) mutually reinforce the self-perpetuation of the ILS. In addition, there is more room for occasional dysfunctional rules.\textsuperscript{151} With approximately 190 states in the world, the number of inevitable mistakes in international law-application may increase moderately without jeopardizing the stability of the system.\textsuperscript{152} The more robust the system, the more it can tolerate errors.

\textsuperscript{150} Curiously, Gunther Teubner believes that global law is fragile because it is disconnected from states and hence lacks institutionalized support. See Gunther Teubner, The King’s Many Bodies: The Self-Deconstruction of Law’s Hierarchy, 31 Law & Soc. Rev., 763 (1997). This, however, may be a self-inflicted artefact of Teubner’s own insistence that legal systems speak in a closed circle of discourse – that there is a fundamental disconnect between law and the real-world entities it applies to. On the contrary, the Article, as evidenced by the decision-tree, models the ILS as processing real-world inputs, outputting a code (‘illegal’ or ‘not illegal’), and examining the success vel non of real-world settlements in deleting or modifying the rules in its databank.

\textsuperscript{151} A nineteenth-century example of a dysfunctional rule was the “Calvo Clause” provision inserted in concession agreements, attempting to dispossess a nation of its right to redress claims on behalf of its nationals. That rule was eventually defeated by the successful argument that a national has no standing to waive his nation’s claim, even if he is the sole beneficiary of the claim. For further discussion, see International Law Anthology, 312-15 (A. D’Amato, ed. 1994).

\textsuperscript{152} The ICJ’s various rulings on the Lockerbie matter with respect to Security Council resolutions negatively impact the stability of treaties. The Court has arguably made a major error of interpreting international law that sooner or later will be overruled when a future case raises the same issue.
b. Custom

Although it is generally said that norms of customary international law arise out of the practice of states, the question is: how can we know when a norm 'arises'? Given the almost metaphysical intractability involved in framing the question this way, perhaps the question itself is misleading. The present Article contends that it is the ILS, and not the states, that gives rise to norms of customary international law. The norms the ILS creates are of course based on the interactions of states in the real world – that is, state 'practice' consisting of claim/counterclaim and 'settlement' as the term has previously been described in this Article – but they are not blindly determined by state practice. The international legal system cannot normatize everything that states do because dysfunctional acts would be normatized along with equilibrating acts.

At its very beginning the ILS knows nothing about its environment. It would be hard-pressed to draw up a list of norms that would help it survive, since it would have no idea how those norms would play out in practice; there could be many unintended consequences resulting from the adoption of rules that superficially look logical but turn out to have an adverse effect upon the ILS. Thus the ILS adopts the cost-effective strategy that all autopoietic systems adopt: it waits to see what happens in the environment and then picks and chooses the environmental factors that are most conducive to its own survival. In the case of the ILS, the factors are norms. The norms it initially adopts are those that govern the settlement of real-world controversies. Thus if there is a real-world clash of claims, actions or reactions, eventually followed by a settlement, resolution, or accommodation of those claims, then the ILS adopts the norms that characterize and govern the settlement.153 The ILS knows that rules that led to peaceful accommodation between the parties to a controversy are the very rules that lead to peace for every-

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153 It is an error to look at the practices of states without considering the governing norms. For example, many governments engage in the torture of some of their political opponents. But they rarely if ever claim that a norm of international law permits their behaviour. Instead, they (a) deny that they have tortured anyone and (b) affirm that there is an international no-torture norm. On some rare and utterly regrettable occasions, governments have allowed the screams of tortured persons to be heard publicly yet 'unofficially.' See Anthony D'Amato, Torture as Raison d'État, 10 Criminal Justice Ethics, 40 (1991).
one. And peace, in turn, is credited to the ILS – an accreditation that furthers the stability and persistence of the ILS over time.¹⁵⁴

Thus it is no accident that norms of customary international law reflect the successful practices of states. Conversely, it is no accident that, as Louis Henkin famously observed, “Almost all nations observe almost all principles of international law and almost all of their obligations almost all of the time.”¹⁵⁵ The reason why most states are law-abiding is a logical consequence of the fact that the rules they observe are those that describe their successful behaviour. Another way of looking at this would be to state the contrapositive of Henkin’s point: most states cannot be held to be lawbreakers most of the time. Law-violation, to make any sense, must be a minority phenomenon. Suppose there was a legal system that coded the vast majority of actions as ‘illegal.’ The cure for this anomaly would not be to change anyone’s behaviour, but simply to reverse the internal coding of the legal system.¹⁵⁶ Thus customary law is just a description of successful majority practices over time.¹⁵⁷ These majority practices, whatever they might be, are normatized by the legal system as if they were sprinkled with holy water. Once blessed, further practices along the same lines are stimulated.¹⁵⁸ Thus the process of customary international law is self-reinforcing.

¹⁵⁴ Gunther Teubner’s rather different perspective on this same point is valuable: that legal systems ‘externalize’ their foundations so as to link their validity to a more fundamental or stable concept. Gunther Teubner, Breaking Frames: The Global Interplay of Legal and Social Systems, 45 Am. J. Comp. L. 149 (1997).


¹⁵⁶ Prohibition (of intoxicating liquors) failed in the United States because of widespread violation. The response of the legal system was to pass the Twenty-First Amendment repealing prohibition.

¹⁵⁷ The implied premise in this argument, of course, is that majority practices over time must be peacetime practices.

¹⁵⁸ In this respect, customary law is very much like the law merchant. For a discussion, see Anthony D’Amato, The Central Point of Custom, in International Law Anthology, 86 (A. D’Amato, ed. 1994). Interestingly, lex mercatoria now may be making an impact on international custom. See Hans-Joachim Mertens, Lex Mercatoria: A Self-Applying System Beyond National Law? in Global Law Without a State, 31 (G. Teubner, ed. 1997).
However, non-conforming behaviour, if it 'catches on,' can become majority behaviour.\textsuperscript{159} This is one of the ways that norms of customary law change over time. Another way – far more unusual – is that the ILS may choose a non-conforming behaviour because it has a greater propensity to promote the self-perpetuation of the ILS than the existing customary behaviour. For example, in the early 1910s, the prevailing view among international publicists was that the airspace was a free zone analogous to the freedom of the seas.\textsuperscript{160} Balloonists drifted across national boundaries in Europe without incident. Nor were there any complaints when pilots drove the new double-winged airplanes across borders. A customary norm, or at least a strong presumptive customary norm, had been established by these uncontested actions of balloonists and pilots. Then war broke out in 1914. It was rapidly realized that hot-air balloons and airplanes could drop bombs on the towns and cities below. And just as quickly, the international legal community perceived that the better analogy to the airspace was not the high seas but the territorial zone. The three-mile limit of the territorial zone – at least as legend has it – was the maximum distance that a cannon shot could carry from a vessel to the shore. Thus every nation claimed an exclusive jurisdiction over its airspace similar to the jurisdiction it enjoyed over its territorial waters. To put this development in systemic terms, the ILS realized that all its norms, and hence its own existence, would be jeopardized if it insisted on a norm of freedom of the airspace; such a norm would be tolerated by no state and no person, given the fear of bombardment from the sky. Hence the ILS was predisposed to accept the next event – the shooting down of a balloon or an airplane by a nation over its superjacent airspace (even if it turned out that it contained no bomb) – as one that would not be coded as illegal. Whether or not such an event ever happened (the historical record is unclear), the ILS was prepared to accept its positioning as a sufficiently concrete and realizable event\textsuperscript{161} to justify coding it as legal.

\textsuperscript{159} This assertion is admittedly vague. An attempt to spell out the detailed mechanism involved in changing an established customary norm can be found in \textit{D'Amato}, Concept of Custom, 73-102.

\textsuperscript{160} \textit{Bijan Kukmar Mukherjea}, The Problem of Aerial Law, 37 (1925), quoting the Continental jurists Meili and Merignac.

\textsuperscript{161} In the same manner that courts will accept a probable concrete event as the basis for an injunction.
The norm that governs the settlement of a controversy is often made explicit in an agreement or treaty between the parties. But treaties are also a primary mechanism for the avoidance of future controversies. Thus one can hardly read the works of 'positivist' writers such as Vattel, Oppenheim, Hall, and Lawrence, without noticing that the vast majority of the rules of customary law that they discuss in fact had their origin in treaties. A treaty is the easiest way to effect a change or modification in an international norm without the need to violate the norm. Since the ILS adopts the norms that have worked in practice, the norms it adopts are not just those that grow out of controversies but also those treaty rules that either resolve past controversies or avoid future ones.

c. General Principles

"General principles of law" is listed in Article 38 of the Statute of the International Court of Justice, after treaty and custom, as a source of rules for the Court to apply in disputes. Nevertheless, the ILS model predicts that 'general principles' cannot be given the status of a third-level rule even though it can at times function like a third-level rule. The reason is logical: a rule that has its origin in the domestic law of many states – even if the same rule is found in the domestic law of every state in the world – cannot automatically be lifted up to the plane of international law without risking the possibility of systemic dysfunction. The rule has not been tested in an international controversy, and therefore it would be purely speculative to designate it as stability-producing or an-

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162 If states M and N achieve a resolution of their conflicting claims in the absence of a treaty, that resolution becomes part of customary law. If instead they memorialize the resolution of their claims in a treaty, they have no power to prohibit other states from using the memorialization simply as a statement of the resolution of the dispute that forms part of the customary practice of states. The argument is spelled out in Anthony D'Amato, Treaties as a Source of General Rules of International Law, 3, Harvard Int'l L. J. 1 (1962).

163 To be sure, the reader has to be acquainted with the texts of the old treaties in order to notice this fact, because the classic writers typically did not cite sources for their propositions of law. For further discussion, see Anthony D'Amato, Custom and Treaty: A Response to Professor Weisburd, 21 Vanderbilt J. Int'l L., 459 (1988).

164 The proposition that treaties are a source of custom is spelled out in D'Amato, Concept of Custom, 103-66.
archy-producing. A domestic rule may have great utility domestically, but that is no guarantee that it will be usefully adaptive if elevated to the quite different realm of regulating the external relations of states.  

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d. *Jus Cogens*

It is uncontroversial that some norms of international law have a higher status than other norms. For example, the prohibition of slavery trumps the right to work. The Vienna Convention on the Law of Treaties provides that a treaty that conflicts with a peremptory norm (commonly called a norm of *jus cogens*) is void.  \[166\] A peremptory norm is defined as one "from which no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character."  \[167\] However, this formulation raises fundamental and unsolved questions: how does such a norm arise, and if it has arisen, how can it be modified or replaced?  \[168\] If on the one hand it is simply a norm of customary law, then its ascertainment or modification would no longer be mysterious, but at the cost of vacuity. Thus, in the slavery example, since we already know that the prohibition on slavery is hierarchically superior to the right to work, nothing would be added to the force of the prohibition on slavery if it were denominated a norm of customary international law. On the other hand, if *jus cogens* is on a *higher* plane than customary law and has any substantive content at all, then it would have to be taken as a superior imperative to the self-perpetuation of the system. Thus, in possible contexts, the application of *jus cogens* could destabilize the entire structure of international law. A general system's ability to survive could be jeopardized if such a rigid

\[165\] "General principles" has probably made its most useful and noticeable appearances when applied to procedural and jurisdictional rules of international tribunals. Two prominent examples are the subject-matter jurisdiction ruling in the South West Africa Cases, 1966 ICJ Rep. 6, which was based on the general principle of domestic subject-matter jurisdiction, and the informed-consent rule to indictment pleading in the Erdemovic Case, ICTY, 7 Oct. 1997, Separate Opinion of Judges McDonald & Vohrah. So long as general principles of law are applied to court procedures, they pose no threat to the equilibrium of the international system.


\[167\] *Id.*

substantive requirement covering all contingencies were to be hard-wired into the system. (But even if that happened, the ILS would probably figure out a way to overcome it and save itself.)  

The ILS is a long way from working out a hierarchy of norms. Yet a hierarchy is necessary when one human-rights norm conflicts with another. The concept of *jus cogens* is at least a rough cut in this general direction. It calls for two categories: important and very important. A card-carrying VIN norm is a proud member of the latter category.

V. Virtual Rules

Swirls and eddies of communications, like winds of atomic particles, permeate the legal noosphere. But there are even more numerous virtual communications which, like their quantum mechanical counterparts, dance in and out of reality. Since they occupy a critical space between law and no-law, they might be called 'virtual law.'

Virtual law is indicated in the lower part of the decision tree which, now fully assembled, is as follows:

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169 For example, a kind of *jus cogens* clause is contained in Article 5 of the US Constitution which specifies how amendments to the Constitution may be made but specifically denies any amendment that would deprive a state of its equal suffrage in the Senate. But in the event of an emergency where the continued viability of the Constitution is at stake, lawyers would argue that there is nothing to prevent Article 5 itself from being amended so as to delete the equal-suffrage exception.


171 Such a hierarchy could be mapped out on a fitness landscape, with the higher peaks representing the more important norms in the hierarchy.

Figure 5. Fully assembled Decision tree for autopoietic legal systems

Real-world environment

<table>
<thead>
<tr>
<th>claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>no objection</td>
</tr>
<tr>
<td>counter-claim</td>
</tr>
</tbody>
</table>
settlement (if any)

INPUT

Illegal?

self-preservation filter

equality filter

reciprocity filter

interdependence filter

Search database

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Code Legal?

Store Yes No

OUTPUT Code Virtual Law

| Assimilate Code |
| Store |
Recall that there is no need, for reasons previously stated, for the ILS to
tell the world that something is 'legal.' However, the code 'legal' is im-
portant for its internal purposes. As the decision tree indicates, a deci-
son reached by the ILS that an inputted claim is 'legal' is assimilated
into its database. There the approved claim becomes another node in
the increasingly tightly-meshed network of international norms.

Let us now consider claim $S$ and follow its path through the system:

Claim $S$: State A is entitled to sovereign immunity in the courts of state
B.

Assuming that Claim $S$ is inputted into the ILS,\textsuperscript{173} the first question is
whether the claimed entitlement is contrary to international law. It pro-
cceeds rather smoothly through the first three filters – self-perpetuation,
equality, and reciprocity. However, the fourth filter tags Claim $S$ with a
weak presumption of non-interdependence because the norm of sover-
eign immunity lessens the opportunities for international connectivity.
To be sure, a national court might not satisfactorily resolve a particular
dispute. Or the foreign nation that loses the suit may simply refuse to
accept the court's judgment. Nevertheless, the sovereign-immunity en-
titlement removes national courts wholesale as forums for resolving
some or many disputes.

With the 'tag' of the fourth filter, Claim $S$ now proceeds downward
through the ILS database. The database reveals that a number of state
courts grant sovereign immunity to foreign states with perhaps a major-
ity allowing exceptions when the foreign state's act is of a purely com-
mercial nature. But the data are too mixed to exhibit a clear rule one
way or the other. As a result, despite the influence of the 'tag' pulling in
the opposite direction, the ILS predictably will not answer 'yes' to the
question of illegality. As a result, there will be no output as to Claim $S$.
The ILS will remain silent on the matter.

However, the internal mechanism of the ILS is still at work. Having re-
ceived an answer of 'no' to the primary question of illegality, the claim
now proceeds downward and encounters the internal question whether
the claim is 'legal.' Here, for reasons that mirror the previous reasons –
that the database does not point unambiguously either in the direction
of illegality or legality – the ILS must again answer 'no.'

\textsuperscript{173} For example, it arises out of a controversy between A and B, or else a
judge in a national court of B wants to know whether to grant sovereign immu-
nity to A.
The ‘no’ answer leads to the categorization of ‘virtual law.’ Indeed, claim S belongs to a wide range of claims well understood by international-law professionals as ‘comity.’ Thus Claim S will go into storage in the ILS’s databank under the category ‘virtual law’ and the sub-category ‘comity.’

The number of pre-norms filling virtual space, other than norms of comity, is vastly greater than the number of existing norms accepted as law by the ILS. But it is important to remember that a virtual norm is not equivalent to a non-existent norm, just as a virtual elementary particle is not equivalent to no particle at all. Indeed, the most forward-looking aspect of international law today is the creation of myriads of virtual norms by non-state actors. Many interest groups and non-governmental organizations articulate on an almost daily basis new virtual norms. New draft multilateral treaties contain careful articulations of norms. The mere verbal expression of these norms brings them into virtual existence in the legal noosphere.

Once they enter the discourse space, the virtual norms change that space. They occupy niches that might otherwise have been occupied by virtual norms having a different content. They hover in the space, waiting to be born. Most of these new virtual norms are human-rights norms, and most of the new human-rights norms seem to line up with one another like iron filings in a magnetic field. Even unborn, they make the space they occupy more receptive to international-law norms like themselves – that is, real norms with similar content. The ILS, on the lookout for its own self-preservation, ‘knows which way the wind

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174 Comity appeals to the leisure-maximizing judge – described with apparent approval by Judge Richard Posner – who strives to reduce his docket of cases so that he can watch television or go fishing. See Richard A. Posner, Overcoming Law, 109-44 (1995). However, in domestic legal systems there seems to be no undersupply of litigation, and judges – paid a fixed annual salary – have little incentive to expand the scope of the law and thus encourage more litigation. Domestic-court judges could not be expected to care very much whether international norms become more interdependence-producing. Thus when faced with a choice of removing a case from the docket on grounds of comity, or proceeding with it and possibly helping the system of international law, the former alternative tends to win. (However, as domestic-court judges become more international-minded, we may begin to see an erosion in comity rules respecting sovereign immunity.)

is blowing.' Human-rights norms may be nudging the entire ILS onto a new fitness level.

Conclusion

This Article has attempted to extend autopoietic systems theory to the construction of a moderately complex model of the international legal system. It needs improvements and refinements. In its present form within the dialectics of legal discourse its best hope is to stimulate further research.