

Complexity and the Law¹

Pierre Garello

Aix-Marseille University, GREQAM

pierre.garello@univ-amu.fr

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Abstract: The present contribution bears on the relationship between the complexity of social phenomena and the rules that frame the dynamics of those phenomena. Its starting point is the Hayekian distinction between organizations and spontaneous orders to which we add the suggestion of Epstein that we should choose simple rules for a complex world. We offer a critical appraisal of that statement, looking in particular to Epstein's analysis of liability rule, and argue that a rule of negligence, albeit more complex than a rule of strict liability, fits better the dynamics of a complex order. We conclude that *the nature of the process* through which the rule emerges is more important than the degree of simplicity of that rule. We close the paper with some general reflections on the challenges presented by new researches in adaptive complex orders.

¹ Earlier drafts have benefited from comments received at the Austrian Colloquium at New York University, at the Italian Association for Law and Economics' meeting that took place in Torino (2011), the Law & Economics Seminar of Aix-Marseille University (May 2012) and the Paris conference on hetetodx economics (July 2012).

1. Why an Austrian approach to law should be different

Many presentations of what came to be known in economics as the Austrian paradigm have been made available.² It is not the purpose of this paper to offer a new one and we will take it as granted that the core elements of this paradigm include:

- The subjectivity of resources: each economic actor develops his/her own vision of what can be done to reach his/her goals. Hence, resources are not “given” and decision-making involves a creative dimension; entrepreneurship.
- As a consequence, the world we are trying to understand is “open”. Surprises and mistakes are necessary elements of learning. In particular, the market is best seen as a discovery process.
- Despite those tensions the world is not in a permanent state of chaos. Human actions display some sort of coordination. Sources for this coordination are to be found in the price system, entrepreneurial alertness and the institutions that empowered the price system and give a specific direction to entrepreneurship.
- This dynamics is globally a dynamics of progress although it can bear here and there some sour fruits. However, because this progress is tight with a complexification of interactions, attempts to regulate that social dynamics is bound to bring unintended, and most often worse consequences.

Without denying that those elements might play some role in competing paradigms as well, combining them is likely to give an economic analysis of law different from the ones developed from the main stream neoclassical or the behaviorist paradigms. As a matter of fact, an application of Austrians insights to the field of law and economics is often seen as one of the most promising development of that paradigm.³

The present contribution bears on the relationship between the complexity of social phenomena and the rules that frame the dynamics of those phenomena. Its starting point is the Hayekian distinction between organizations and spontaneous orders.⁴ To this distinction is often associated another distinction between rules that issue commands and rules that define and protect spheres of freedom for each member of the group, with the

² See for instance, Rizzo 2011 or Rizzo 2010.

³ *Ibidem*

⁴ See Hayek (1976).

proposition that only rules of the latter group—those defining and protecting spheres of freedom—can give rise to a spontaneous order, that is, to a complex, adaptive and self-organizing system of interaction. From there it follows that, if one wishes to take full advantage from what a complex system can bring, one must favor rules that “simply” define spheres of freedom (‘keep-off rules’). As Epstein so nicely put it, we need “simple rules for a complex world”. As a corollary, any attempt to design rules with a level of complexity that matches or pretend to match the level of complexity of our modern societies is a sure way to chaos (in the common sense of the term).

This understanding of the articulation between rules and spontaneous orders is heavily loaded with policy implications. When writing the above-mentioned book for instance, Epstein is trying to reverse a trend that has led, as he likes to put it, to a situation with “too many lawyers and too many laws”. More generally, such understanding of the emergence and working of spontaneous orders can be found at the center of most arguments—starting with Adam Smith’s—in favor of limited government and minimal market interferences.

Although the understanding outlined here of the dynamics of an order and the normative corollaries of that understanding can claim many supporters, they are far from uncontroversial. Doubts, among economists as well as public decision makers, crystallize around two questions:

- a/ A positive one: Do complex (sophisticated) systems really develop around (necessitate) simple rules?
- b/ A normative one: What’s so good about such spontaneously emerging systems?

This paper deals with both questions. To address the first question, it starts with a critical presentation of Richard Epstein’s basic principle—Simple rules for a complex world. Having found his arguments to be rather complicated and even, at times, unconvincing, it then suggests that the core virtue of a rule fitted for a complex order is not its simplicity but rather its “spontaneity” (that is, how the rule originated). A rule that develops from interactions between the actors of the spontaneous order is, almost by definition, common knowledge and, for that reason, proper to guide the formation of expectations and sustain the order. As for the degree of complexity of the rule *per se* it might very well vary with the context of its emergence.

This being said, *in fine*, scholars and decision makers are not so much interested in identifying what type of rules is more likely to bring about the development of a complex, adaptive and self-regulated system. Instead, they wish to identify the best policies, the right attitude to adopt regarding rules, and this requires that a judgment be made on those complex, adaptive and self-regulated systems. For if those orders have more defects than virtues, why should we protect the rules that allow them to develop in the first place.

Hence, the second half of the paper points more in the direction of normative economics. The, admittedly modest, step taking here consists in listing some controversial issues related to theories of spontaneous orders, and in particular to the market. For one thing, since the market order co-exists with many orders and organizations, what do we know about tensions between those systems (think about big corporations and the market, or the environment and the market)? How are those various orders interlocked? Also, since there exists parallel orders, are they dependent on values that could be understood as meta-rules? Finally, how is it possible that the community of scholars of emergent complex systems is split in two camps; some arguing that governments can't improve on the market order while others hold the opposite belief? Clearly making explicit those "points of frictions" should help us decide whether the development of spontaneous orders deserves to be protected and/or can be consciously improved on.

2. The "classical" story about spontaneous social orders as complex adaptive systems relying on simple rules

The story, at least in its modern version, starts with Hayek's contribution. To synthesize Hayek's ideas (as developed in particular in *Law, Legislation and Liberty*) it might be useful to refer to the simple table below.

Spontaneous orders compared to organized orders (organizations)

	Designed and purposeful	Nature	Degree of complexity	Type of rule
Spontaneous order	No	Abstract	High	“Negative” and general
Organized order	Yes	Concrete	Low	Individualized commands

The first implicit proposition leading to that table is that social life is sometimes, but not always, orderly. What is meant here by order is of course crucial. Hayek put it that way:

“By order we shall throughout describe a state of affairs in which a multiplicity of elements of various kinds are so related to each other that we may learn from our acquaintance with some spatial or temporal part of the whole *to form correct expectations* concerning the rest, or at least expectations which have a good chance of proving correct”. (LLL, Vol. I, p.35)

Order prevails, therefore, where individuals can with reasonable chances of success find their way in their social environment thanks to their knowledge of a small number of elements. If I decide to go shopping this afternoon, I know where to start (although I don’t know necessarily what I will find and buy). If I work for the library, I (usually) know each morning what to do and where to start. In both cases, the individual has enough understanding of what is going on to plan his/her action, to project himself/herself in the future. By contrast, where there is no order the individual reacts more than he/she acts. For instance, a stock exchange or a monetary system is in a state of chaos when market participants do not understand what is going on. This can lead to panic, although panic can arise even in the absence of chaos.

The second proposition presented in that table is obviously that, contrary to what our intuition suggests, there exist not one but two types of order in social life. Orders of the first type are concrete, in the sense that any member of the society can easily identify them, they also serve a clear purpose. Firms and governments are the classic examples of such orders. Spontaneous orders, at the opposite, are abstract in the sense that actors involved in those orderly systems are not necessarily aware of their contribution to the system, or even that they are part of a complex system. Also important is the fact that those abstract orders have not been designed; they emerge and develop, so to speak,

spontaneously. The market and the law—at least for part of it—would belong to that second category. This is of course a key point in the Austrian understanding of law.

That a system of interaction can work to the satisfaction of everyone—or at least to the satisfaction of most—without having been designed and without being controlled by anyone in particular comes surely as a puzzle. The puzzle is partly resolved as soon as it is pointed out that agents interacting in those spontaneous orders *do follow some rules*, just as in an organization. The fact that those rules can be, and to a large extent are, themselves the fruits of a spontaneous evolution changes nothing. The rules exist and are known to all individuals who, consciously or not, are hence guided through the complex system.

So far, the “story” told by the table is nothing more than an interesting curiosity. The distinction between the two types of order becomes, however, crucial once it is recognized that spontaneous orders can develop to reach degrees of complexity that far exceed the degree of complexity one can expect from a system entirely human-designed.⁵ Two precisions are necessary at that point. First, complexity is here measured more or less by the number of elements of the system that directly or indirectly interact with each other (in the classroom this is often illustrated by asking students to think of all the efforts, technology, research, ingenuity and so on that went into the making of their laptop or even of a simple pencil; or to try to draw the organization chart corresponding to the feeding of a city such as New York).⁶ Second, complexity is understood here as a quality: A complex system is a sophisticated system that can perform tasks impossible to a regular organization.

⁵ Another remarkable property—identified when economic science was still in its infancy—is the fact that, although the spontaneous order is devoid of specific purpose and design, and despite the fact that each participant sets his/her own goals, the order brings satisfactory results to most of them. We will come back to this later.

⁶ To be precise, the simple fact that it involves many elements is not sufficient to describe a system as being complex. Hayek (1974) says (page 26, emphasis original): « ..social sciences... have to deal with structures of *essential* complexity, i.e., with structures whose characteristic properties can be exhibited only by models made up of relatively large numbers of variables.” Interestingly, in the *Wealth of Nations* Smith takes an example similar to the one taken in the classroom when he describes the clothes and furniture belonging to a simple worker: “Observe the accommodation of the most common artificer or day-labourer in a civilized and thriving country, and you will perceive that the number of people of whose industry a part, though but a small part, has been employed in procuring him this accommodation, exceeds all computation.” (Book 1, Chap. 1, *Wealth of Nations*)

The last episode of that “classic story” about spontaneous orders describes how the degree of complexity reached by the system is linked with the nature of rules that frame the system. The rules governing a complex order are not “ambitious”, they don’t attempt to gear the all system towards a specific direction (otherwise the order would not be purposeless). On the contrary, they bear *on the process* of interactions, telling essentially to all the members which behaviors are forbidden. Hence, as long as actors do not violate those “negative” rules, they are free to do whatever they want.⁷ Therefore, it is said, such rules allow for the flourishing of human ingenuity and, in a very natural way, for innovative uses of local, dispersed and tacit knowledge.⁸

It is this understanding of the working of complex orders that is, in our opinion, well captured in the title of Epstein’s book: Simple rule for a complex world. The spontaneous order of interactions that we enjoy today has developed around and together with simple rules (property, contract, tort, first possession). The increase of regulation that took an exponential trend in the course of the last hundred years (and make it necessary to hire so many more lawyers) is endangering that order.⁹

3. Problems with the “simplicity” argument

The precise claim made by Epstein is that “the proper response to more complex societies should be an even greater reliance on simple legal rules, including older rules too often and too easily dismissed as curious relics of some bygone horse-and-buggy age” (21). He then goes on listing and discussing the, mostly negative, rules that could do the job: “self-ownership, first possession, voluntary exchange, protection against aggression, limited

⁷ The term “negative” should here be given the same meaning as in the well-known distinction between negative and positive *rights*.

⁸ For a definition of what is meant here by tacit and dispersed knowledge, see Hayek 1945.

⁹ More lawyers might be required as the number and complexity of interactions increase. Still Epstein’s feeling is that the number of lawyers has increased much beyond what was necessary. Applying this logic to the recent crisis of the financial market, it says that, as those markets are becoming more complex, it would be a serious mistake to try to control those interactions by means of complex regulation. Instead, what should be done to avoid future crisis is to make sure that few basic rules (in particular liability rules) are properly enforced.

privilege for cases of necessity and takings of property for public use on payment of just compensation” (53).

Simplicity, as usual, is best defined through a description of its opposite: complexity.

When considering a system of legal rules, complexity increases:

- with increased density (more rules),
- with technicality (you need some expertise to understand the rules),
- with differentiation (rules come from many, potentially conflicting, sources—e.g., federal, state, local) and
- with uncertainty (there is no clear cut way to know whether you abide by the rule),

Because all of those characteristics make compliance more difficult, we can also expect a positive correlation between the complexity of the system of rules and the cost of compliance with those prevailing rules. Indeed, this should even serve as a definition of simplicity.¹⁰

If low cost of compliance is indeed an indubitable advantage for a rule—or a system of rules—and is more likely to materialize with simple rules than with complex ones (keeping in mind the definition of complexity given above), simplicity has, *a priori*, many other bright sides. One of them, may be the brightest, is that simplicity brings with it *predictability*. Indeed, where rules are simple it will be easier to form expectations that have good chances to be correct, if only because it makes sense to assume that everyone knows and remember those simple rules. In other words, the assumption that rules are common knowledge makes *a priori* more sense where rules are simple.

Also, it must be stressed that simplicity of the rule does not mean simplicity of arrangements between individuals. Given a set of rules (especially when those rules are “negative”), actors are free to design fairly complex deals if they wish. If we think of the market, organizations such as firms can be created that are fairly more complex than the basic rules of the market, although still much less complex than the market itself. In the firm, the complexity of the arrangement is chosen by the parties rather than imposed on them by the rules. In short, a simple rule is also more flexible and allows for behaviors adapted to the prevailing circumstances and perceptions.

¹⁰ Obviously complexity here is a bad thing. But note that it concerns the system of rules, not the system of interactions taking place within the sphere of actions admitted by the rules.

Despite all those virtues, however, simplicity is clearly *not* the universal panacea. The obvious reason is that rules are set to create incentives and a simple rule could perform very poorly in terms of incentives given to “actors” of the spontaneous order. Hence, beyond the indubitable advantages of simplicity, we cannot avoid the question of exactly how simple the rules need to be? In other words, we must figure out where the cursor should be set between the simplest rule (which could simply be the absence of rule!) and a very complex rule that attempts to take into account the many details of the system in its present as well as in its expected future states. To do so, Epstein suggests that we adopt a utilitarian stand, minimizing social costs and/or maximizing social benefits. In particular, *whenever two rules are identical in terms of incentives*, the utilitarian position clearly requires that the rule having the lowest compliance cost, that is, the simplest of the two rules, be preferred.¹¹

The chapter on tort law and liability rules gives him the opportunity to apply that principle and it is interesting to follow him in his argument. Hence, he argues that in those cases where the rule of strict liability (whoever harms someone else should compensate for the harm done) and the rule of negligence (you should compensate the victim only if you are found negligent) generate the same incentives,¹² strict liability should be preferred to negligence since it is less costly to comply with it. In particular, the strict liability rule gets rid of the cumbersome task of assessing whether the defendant was negligent.¹³

There is no reason to quarrel that a strict liability rule is in some instances simpler to use than a negligence rule, but does it address properly the needs of the actors of *a complex*

¹¹ Note that, if the simplicity of the rule is defined in terms of compliance costs then a rule with a simple formulation does not necessarily qualify as a simple rule. The rule that states « You are free to write the contract you wish as long as it does not violate public order » has a simple formulation, but compliance costs can be high if it is costly to find out what « public order » means and what it requires.

¹² Such equivalence of the two rules in terms of incentives occurs in particular where the harm is not jointly caused.

¹³ Standard economic analysis of law, at least as a first approach, tends to neglect such cost of compliance. Judge Learned Hand’s formula is supposed to provide a sure and costless guide to decide whether the defendant (and in some cases the victim) was negligent. Interestingly, the cost benefit analysis embedded in Hand’s formula is usually considered to be much more precise and less problematic way to define negligence than references to the behavior of a « reasonable person taking reasonable care » (*bonus pater familias*, the man on the Clapham Omnibus and the like). See Cooter and Ulen’s chapter on Contract in their *Law and Economics* textbook, or Epstein (93-94). We will shortly return to the concept of “reasonable man”.

adaptive and open-ended system? Is it really the case that both rules create the same incentives? To make his point, Epstein relies on a standard approach using cost benefit calculus based on probability assessments (94-95). But again, is this the proper description of the way we behave? In a world of radical uncertainty, that is, in a world where we expect some surprise, knowing that we will have to compensate for *any* harm we could cause and being unable or unwilling to rely on probability assessment, isn't the rule of strict liability murmuring into our ear that we better do nothing, stay quiet or opt for an unreasonably high level of care.¹⁴

I would like to suggest here that the notion of *fault* is indeed very suited to guide behaviors in a complex, evolving system. This is especially true where fault is defined using a concept that is sometime the object of mockery: a departure from the “behavior of a reasonable person”.¹⁵ Surely, this definition of negligence is far from simple; some would even qualify it as being fuzzy. But economists should appreciate some interesting similitude between the concept of fault hence defined and the formation of prices. Like prices synthesize in a very interesting way relevant knowledge about the subjective value judgments of millions of persons at one point in time; the perception of what deserves to be called negligence synthesizes much relevant knowledge available at one point in time on subjective costs and benefits attached to various lines of action. Like the level of prices, the precise definition of negligence will change with time. The rule of negligence hence pushes every one—drivers, employers, surgeons, teachers, producers—towards the best use of available knowledge, that is, as close as possible to the “state of the art”. And everyone is aware of that. What more can we expect in a changing world? Sure, like prices, we would like those standards to be more predictable. But, as any serious economist will agree, fixing prices is never a good a solution; we have to accept some fuzziness in the standard.

¹⁴ The possibility to insure will be of no help where probability assessments are not available or are unreliable. Also, it is interesting to recall here that such eminent decision theorists as Leonard Savage or G.L.S. Shackle kept warning us that probability is neither a good description of what we do in a context of uncertainty, nor of what we should do.

¹⁵ For the mockery, see Cooter and Ulen. Carbonnier, a venerated law scholar from France, insists on the distinction between a rational behavior and a reasonable behavior very much as we do here. According to him, the law should be concerned with reasonable behavior (reference to Carbonnier). Also, whenever probability assessments are prohibited by the circumstances, the Hand's formula becomes problematic.

Epstein actually admits that a negligence rule should be preferred in some areas such as medical malpractice because, he says, it provides better incentives there. He writes (104-105): “The medical custom functions like the boundary conditions that can be observed in trespass cases. Those harms that result from compliance with the practice lies with the patient; those that result from noncompliance lie with the physician”. And he adds: “That simple rule is not so simple as it sounds, but it is far simpler than any open-ended cost/benefit analysis.”¹⁶

4. From simplicity to spontaneity

A negligence rule carries with it a very useful piece of knowledge: Where it is enforced, every actor in the complex system knows that, to the extent that he/she behaves “reasonably”, he/she should not have to bear unexpected liability. This precious property is not shared by the strict liability rule that, however, possesses another similar property: In a regime of strict liability every actor knows that, if he/she is harmed, whether voluntarily or involuntarily, whether out of negligence or not, he/she will be compensated. Inversely, if he/she ever harms someone, whether voluntarily or involuntarily and even if he/she has been extremely careful, he/she will have to compensate the victim for the harm. Consequently, in a context of radical uncertainty, the actor will not know whether he/she will have to compensate someone in the near future.

Seen from this angle, the choice between the two rules is far from obvious and I suggest that which one of them will be selected depends on their respective capacity to promote a complex social order and, as we will discuss below, of the general desire among participants to promote the development of a complex social order.

My understanding is that the negligence rule favors entrepreneurship and discovery while at the same time protecting the expectation that everyone will behave “reasonably”. It is therefore a good rule for an adaptive complex order. And because the negligence rule is

¹⁶ He maintains that strict liability is best to manage interactions *between strangers* because, he explains, « most accidents between strangers... are avoidable by the exercise of reasonable care » (104). But, if such is the case, then a negligence rule would be only slightly more costly to implement than a strict liability rule since there would be few cases brought to court anyway. In other words, there would be little to be saved by moving from negligence to strict liability.

more complex than its competitor—at least at the implementation stage that requires that the judges (eventually with the help of experts) evaluate the “reasonableness” of the defendant’s behavior, we must conclude that simplicity should not be the yardstick to evaluate whether a rule is suited for a complex world. What counts is to preserve and promote the complex order and, in that undertaking, simplicity, which let us emphasize once again brings with it many positive consequences, does not necessarily plays the central role.

As an aside, a parallel can be made between the skepticism expressed here regarding a systematic simplification of the possible institutional arrangements or rules and the findings of Elinor Ostrom and the Bloomington school. One of the first findings of that group of scholars was indeed that arrangements that appear at first glance unnecessarily complex and inefficient do in fact deliver better services than simpler (and often centralized) arrangements. Also interesting is the observation that those arrangements (polycentric governance as they call them) are developed “from the bottom” by the agents themselves.¹⁷

Putting things together it would seem that *what matters for the development of a complex adaptive order is not the simplicity of the rules, but the process through which the rules are molded*. A rule developed through interactions, first, is more likely to be known and accepted by everyone hence facilitating the formation of expectations, and second, is more likely to strike the right balance between simplicity and incentives, at least the balance that satisfies members of the group. It is also more likely to be “flexible” in the sense that it can be adapted—eventually through its implementation stage—to the evolution of the complex system. We are back to the Hayekian understanding and defense of the Law, with a capital L. The Law must support the order of interactions, where, to repeat ourselves, “By order we shall throughout describe a state of affairs in which a multiplicity of elements of various kinds are so related to each other that we may learn from our acquaintance with some spatial or temporal part of the whole *to form correct expectations*

¹⁷ See Ostrom (2010) and Alegica et ali (2010) for a perspective on their contributions. For concrete examples of the development of polycentric governance see Ostrom (2009) or Ostrom et ali. (1995). Buchanan (1963) or Coase (1974) are, in my opinion, sending similar messages.

concerning the rest, or at least expectations which have a good chance of proving correct”. (LLL, Vol. I, p.35)

Respect for rules that have been molded through interactions between actors of the complex system creating and adjusting to new circumstances requires that we give up on the idea of an optimal rule. Epstein’s position on this is not always clear but he certainly perceives what is at stake when he writes (39) “The only question for the legal system is how it will make its errors, not whether it will make them. Simple rules are adopted by people who acknowledge that possibility of error up front, and then seek to minimize it in practice. Complex rules are for those who have unattainable vision of perfection.” Indeed, perfection is a misleading target, but what matters is not so much to stick to simplicity than to preserve and promote the order: and the latter does not necessarily implies the first. This is much in the spirit of one of the oldest guiding principle of law: to secure legitimate expectations.

5. The merits of a spontaneous order. What’s so nice about complexity?

Although I have been so far critical of some of Epstein’s arguments—or may be just of his way of framing them—let me insist that his efforts to go beyond the “classical” story told at the beginning of this paper and to look more closely at the actual working of a spontaneous order are praiseworthy. For indeed there are many weak links in that story that call for further investigations. Looking at the nature of the rules, as we have done so far, is one way to move forward, but the two tasks of understanding the rules and understanding the complex system that develop from those rules are complementary and one must therefore move back and forth from one to the other. For that reason, I will end this brief excursus on the rules of spontaneous orders by pointing out to few other weak links in our understanding of complex orders asking you to forgive me for being unable at that point to have little more to offer than a list of points.

First, the “classic story” often insists that spontaneous orders are much more complex than organizations. This is sometimes taken to run against casual observation.¹⁸ I don’t subscribe to this point of view (unless you define complexity differently from Hayek), but those judgments rely on a confusion between, on one hand, complexity of the *order* and, on the other hand, complexity of the *rules* sustaining the order (let that order be an organization or an emergent system). As noted by Epstein (but we could as well go all the way back to the *Theory of Moral Sentiments* for the same observation), family rules can afford to be more complex than rules prevailing among strangers, and often *are* more complex. And I believe the same can be said of rules prevailing inside some organizations. This, in turn, raises the question of a possible correlation between the size of a group and the complexity of the rule. **Could it be that, as “the size” of the order grows (from the family, to the firm, to the market), rules systematically get simpler? If we are tempted to give a clear positive answer, we should also consider that a complex system develops somehow by “absorbing” other, less complex systems.** Such interlocking of systems would make it difficult to disentangle the rules of the respective systems. Or, to put it differently, the rules of the different orders must be compatible (otherwise there would be no possible cohabitation) and this requirement creates feedbacks from one order to the other, the rules of an organization having, for instance, to evolve following an evolution of the rules of the market. Such feedbacks make it difficult to speak of a clean evolution from complex to simple rules as the size of the group increases.

More generally, feedbacks between different orders prevailing at one point in time seem to deserve greater attention. For instance, as pointed out by diZerega (2008), it appears that organizations often work *against* the emergent order that nourishes them. DiZerega has in mind phenomena well known to public choice scholars: large corporations collude with governments in order to stop or at least slow down competition associated with the market order. Such feedbacks, although well documented, have not received, to our knowledge, many systematic treatments.¹⁹ Again, the compatibility between various

¹⁸ For such a recent criticism, directed mainly towards Hayek’s understanding of spontaneous orders, see Bouraoui (2009).

¹⁹ See, however, Ikeda (1997)

orders, how they are connected, whether they reinforce each other or destroy each other, deserve further attention.²⁰

Still regarding the cohabitation between various orders, many have expressed concern over the possibility that the market order is incompatible with the complex order of nature. Besides the recent debate over climate change, one finds many instances of this in history of economic thought, from Malthus to the Club of Rome passing through Jevons. Those worries are usually addressed by referring precisely to the adaptive dimension of the market order: if we run short of land, coal or oil, the complex system has the capacities to adapt to the new situation, therefore we don't care so much about destroying the "natural order." Although it is relatively easy to pile up historical examples that support the discourse of those who see no possible conflict between the two orders (market and "nature")—just look at the predictions of Malthus, Jevons and the Club of Rome!—this should not exempt us from being more explicit about the mechanisms (if any) that make the two orders compatible. To use Hayek's language, we should be more explicit about how the pattern prediction (that the social order will adapt without causing irreversible damage to the natural order that could endangered the social order) is reached, especially where the price system is not in place.

As is well known, the study of emergent orders has attracted the attention of many scholars, especially during the last thirty years.²¹ And equally known is the fact that those scholars, who admittedly use different "brands" of complexity theory, have sometimes reached opposite conclusions, in particular when it comes to the key question of the ability of the government to improve on the working of the market order. Hence we strangely found ourselves in a situation very much similar to the one encountered in the 1920s during the economic calculation debate: economists sharing most of their analytical tools were nonetheless reaching opposite conclusions. What we need is the equivalent of a "Hayek 1945" that could explain where and why the various approaches take different routes. I see entrepreneurship as a crucial crossroad; some approaches totally ignoring this fundamental trait found in any order involving human beings.

²⁰ In the same vein, it is often argued that the development of the State (an organized order) was detrimental to such orders as families or civil society. Is it so? Can this be avoided and how? DiZerega also insists that the market order and the financial order should not be confused. Is it so?

²¹ See, for instance, Rosser (2009), Collander (2008), Arthur (1997).

Still another field for exploration is the role of “values” in the development of an adaptive complex order. Comparing scientific research and the market, diZerega notes (4, emphasis original) “In principle any voluntary agreement could be made within the context of any of these rules. Nevertheless, particular rules encourage some kinds of goals more than others. In doing so these rules establish what I term a *systemic bias*, even if they do not specify which among a large number of mutually exclusive possibilities the system will at any time manifest.» This, let us underline, amounts to downplay (or contradicts) the hypothesis that spontaneous orders are without purpose. If so, what would account for such systemic bias?

May be we can illustrate what I believe is at stake here with the discussion developed in the first part of this paper. Why does society tend to prefer today strict liability to negligence? Is it just because our world is more complex and such increased complexity requires a change in rule²² or is it because the general attitude towards “accidents” has changed and the desire to compensate all victims has become irresistible? And if the latter is the case, what can account for such evolution? Is it endogenous or exogenous to the system?

Last but not least in the list of new problems arising from a shift from the study of closed-system to the study of open, un-designed and purposeless systems is the normative question. On this thorny topic, Epstein chooses to side with utilitarianism. He writes (30):

Within professional philosophical and economic circles, “utility” has become the all-purpose placeholder for those goods and consequences that are desired, either by individuals or by collectives. Accordingly, the maximization of social utility becomes the objective of a sound system of legal rules. Although I have from time to time been of different minds on this proposition, I have now made peace with myself and believe that this consequentialist theories—that is, those which look to human happiness—offer the best justificatory apparatus for demarcating the scope of state power from the area of individual choice.

²² Keeping in mind that in even earlier times strict liability was dominant. Hence the historic would have been: from strict liability to negligence and then back to strict liability. It is sometimes argued that new risks (machines, cars, etc.) called for new sources of liability.

The reason why, contrarily to Epstein, we can't make peace with ourselves is simply that we can't see what maximization of utility (and even less social utility) has to do with the choice of rules that frame a *discovery process*. How do you know whether you are maximizing discovery? Actually, if we are right, the rules suited to the emergence of a complex and adaptive order are not "chosen". They themselves emerge from a multitude of interactions and could be inspired primarily by a desire to establish justice among members of the group (such as the protection of legitimate expectations). They would then survive and develop further because of their ability to bring about an order open to progress.

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