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Coordination without Command: Stretching the Scope of Spontaneous Order

PETER T. LEESON*

Abstract

How far can we stretch the scope of spontaneous order? Gordon Tullock's important work on the economics of non-human societies shows how these societies are able to coordinate without command despite features economists typically see as limiting the scope of spontaneous order. Using Tullock's insights, I search for the "human ant nest"— spontaneous institutional arrangements that create human cooperation despite the presence of these obstacles. I find two significant examples of this, both in precolonial Africa. The first demonstrates the effectiveness of spontaneous order in the face of threats of violent theft. The second shows the effectiveness of spontaneous order in the face of social heterogeneity. These cases suggest a broader scope for spontaneous order than conventional wisdom permits.

1 Introduction

How far can we stretch the scope of spontaneous order? A sizeable and growing literature points to the successful operation of spontaneous institutional arrangements of cooperation within at least limited bounds. For instance, multilateral punishment in conjunction with the shadow of the future can secure honest behavior despite the absence of government, provided agents are sufficiently patient. Research by Landa (1994), Bernstein (1992), Ellickson (1991), Greif (1993), and others provide evidence of this.

However, this same literature points to serious limitations on spontaneously-ordered institutional arrangements (see, for instance, Greif 2002; Landa 1994). At least two factors constrain the scope of their application, violence and social heterogeneity.[1] Violence poses a problem because threats of ostracism, for example, do not prevent physically stronger individuals from using their strength superiority to overwhelm weaker ones. A weaker agent may announce his intention never to deal again with anyone who cheats him, but this does not prevent physically stronger agents from using force to take what they want from weaker ones when government is absent.

Social heterogeneity is also problematic. Although multilateral punishment, for instance, functions effectively in small homogeneous groups, it does not for social interactions involving members from different groups. Heterogeneity raises the cost of communication with outsiders, making it more difficult to convey information about individuals' histories throughout the relevant population. Further, where agents have different norms, beliefs, and practices, it is difficult to coordinate on mutual

[1] Some economists would point to many more limitations. However, these are the two I have encountered most commonly and are also the most sensible.

understandings of what constitutes dishonest behavior and how such behavior should be punished. This leads self-enforcing cooperation to break down.

Given these impediments to the effectiveness of spontaneous institutional arrangements, it would seem that spontaneous order has rather limited applications. The spontaneous order of the marketplace is effective, but only in the context of government-enforced property rights. Society requires hierarchical command to overcome the obstacles described above.

The idea of spontaneous order is most famously associated with Friedrich Hayek, but also plays an important role in the work of one of Public Choice's founding fathers, Gordon Tullock.[2] There is a tension in Tullock's research that deals with spontaneous order. On the one hand, he is a great admirer of the market, and like many of those influenced by his work, sees it along with Hayek as perhaps the greatest coordinating device known to man, yet one which does so without central direction.

On the other hand, Tullock is no anarchist. Like nearly all other economists, he explicitly rejects the arguments of some political economists who would substitute the coercive hierarchy of the state with the spontaneous order of purely private institutional arrangements (Tullock 1972, 1974, 2005).[3] In his view, spontaneously ordered institutional arrangements are limited along the lines discussed above.

One would get a very different sense of the scope of spontaneous order, however, if he read only Tullock's (1994) work on *The Economics of Non-Human Societies*. In this book, Tullock seeks to explain how it is that a great part of the non-human world, from

[2] Actually, Adam Ferguson was the first to apply the concept of "spontaneous order" (though not these words) to human institutions. But it is commonplace to ignore this and attribute the idea to Hayek, which I will do as well.

[3] See, for instance, Anderson and Hill (2004), Benson (1990), Coyne (2003), Friedman (1973), Leeson (2003, 2007a, 2007b, 2006), Leeson and Stringham (2005), and Rothbard (1973).

the mole rat to amoeba, engages in intricate cooperative arrangements without anything that resembles central direction. In fact, Tullock's original manuscript for this book was entitled, "Coordination without Command," which I have shamelessly appropriated for my paper.

In this work, Tullock emphasizes that he "is not suggesting that human society is something which we can understand by animal societies" (1994: 3). Recognition of the fact that ant societies, for instance, facilitate widespread cooperation without the use of coercive institutions does not imply the workability of anarchy for humans. Perhaps this claim is humility on Tullock's part. More likely, however, it is recognition of the fact that although human and non-human societies share much in common at the broadest level, beyond this, they seem to share very little.

This paper uses Tullock's insights in *The Economics of Non-Human Societies* to address the scope of spontaneous order for human societies. I challenge his claim that human organization has nothing but the broadest lessons to learn from its non-human counterpart. The application of spontaneous order in the non-human social world may have more in common with the human social world than Tullock admits.

Tullock's insightful work points to coordination without command in non-human societies despite the presence of features like those discussed above, which economists typically see as limiting the scope of spontaneous order. Using his insights, I search for the "human ant nest"—spontaneous institutional arrangements that create human cooperation in the face of these features. I find two significant examples of this, both in precolonial Africa. The first demonstrates the effectiveness of spontaneous order in the face of threats of violent theft. The second shows the effectiveness of spontaneous order

in the face of social heterogeneity. These cases suggest a broader scope for spontaneous order than conventional wisdom permits.

Tullock's discussion starts by taking concepts devised to investigate human interactions, such as the division of labor, games of conflict, and the idea of coordination itself, and applying them somewhat anthropomorphically to the world of insects, animals, and cells. My method here is to reverse Tullock's path of inquiry, or perhaps more correctly, to pick up where he leaves off and in doing so come full circle. He generates insights about spontaneous order in non-human societies by applying concepts of human societies to non-human ones. I apply these insights to the case of human societies with the hope that doing so will improve our understanding of spontaneous order for mankind.

The remainder of this paper proceeds as follows. Section 2 considers the social dilemma faced by humans and non-humans alike. Section 3 examines the operation of spontaneous order in non-human societies. Section 4 searches for analogs in the societies of humans. It focuses on the operation of spontaneous orders under conditions present in non-human societies, which are believed to cause human spontaneous orders to collapse. Section 5 concludes.

2 The Social Dilemma

The problem of social organization is fundamentally one of transforming situations of potential conflict into situations of coordination. This, in fact, is the source of the economic justification for government. In the state of nature as Hobbes famously described it and virtually all political economists since him, including Tullock, have conceived it, individuals face the dilemma depicted in Figure 1:

	Cooperate	Defect
Cooperate	α α	θ γ
Defect	γ θ	$\boldsymbol{\beta}$ $\boldsymbol{\beta}$

Figure 1. The Social Dilemma

Individuals may follow one of two basic strategies when dealing with others, cooperate or defect. Cooperation refers to any individual behavior consistent with the ends of the other members of society. This includes, for instance, peacefully trading, contributing to a 'public good,' and generally respecting the property rights of others. Defection refers to the opposite form of behavior. Here, an individual acts in a way that benefits him at the expense of others. Fraud, theft, free riding, and physical violence are examples of this.

When both individuals cooperate, they both receive α. If one cooperates and the other does not, the cooperative individual who is taken advantage of receives θ, while the defector receives γ. If neither individual cooperates, they both earn less than they could by cooperating and each receives only β. In this game, $\gamma > \alpha > \beta > \theta$, where $2\alpha > (\gamma + \theta) > 2\beta$, which is to say that mutual cooperation is socially efficient.

The unique equilibrium of the one-shot version of this game is for both individuals to defect. Strictly speaking, the logic of the game suggests that in the state of

nature individuals will never cooperate.[4] This situation—the game's pure strategy Nash equilibrium—is clearly Pareto dominated by that in which both agents behave peacefully towards one another.

If the game is infinitely repeated, or what is equivalent, terminates with some constant unknown probability, cooperation is possible. This is what traditional spontaneous institutional arrangements of self-enforcement, such as multilateral punishment, are concerned with. To see how multilateral punishment can sustain cooperation, consider an infinitely-repeated, *n*-player version of the game in Figure 1. Let agents' common discount factor be δ, where $\delta \in (0, 1)$. Using the payoffs from before, players cooperate if an only if $n\sum_{t=0}^{\infty}\alpha_t\delta^t \geq \gamma$. Rewriting this expression gives $\frac{\delta n\alpha}{1-\delta} \geq \gamma$, and solving this for δ yields, $\delta \geq \frac{\gamma}{n\alpha+\gamma}$. Provided agents are patient enough to satisfy this inequality, they cooperate under the spontaneous institutional arrangement of multilateral punishment.

However, a number of conditions must be satisfied for this solution to the social dilemma to work. As the Folk Theorem suggests, if cooperation is sustainable at all there will normally be an infinite number of equilibria. These include defection as a possible outcome. In the infinitely-iterated game involving multiple players, cooperation requires: 1. sufficiently patient individuals; 2. low information-sharing costs; 3. equally strong agents; 4. shared ideas about "defection" and how it should be punished.[5]

[4] Tullock (1999) has an excellent piece on the "non-prisoners' dilemma" in which he points out that if communication, which is prohibited in the strict model, is in fact permitted (which more closely corresponds with real world prisoners' dilemma type situations) cooperation is easy to sustain.

[5] On the role of focal points and the evolution of cooperation without government in the presence of multiple equilibria see, Leeson, Coyne and Boettke (2006).

Condition (1) is usually assumed away because it also poses a problem for government as a solution to the social dilemma. If agents have unusually high discount rates, society is doomed to conflict whether government exists or not. To see this clearly, imagine the limiting case in which we all only cared about our future five minutes from now and completely discounted our futures beyond this point. If we were strictly self-interested payoff maximizers, as this game assumes, we would all try and plunder our neighbors right now, consequences be damned, including incarceration or even the death penalty.

With the other three conditions, however, things are different. If the *n* members of society are socially heterogeneous, for instance they have different languages, their ability to communicate the identity of defectors and thus to punish cheaters through this mechanism can become quite difficult. This violates condition (2), preventing cooperation.

If some members of *n* are substantially stronger than other members, so that their aggression is met with little resistance, the threat of community boycott is worthless. The stronger agents can simply seize what they want by force. This violates condition (3) and cooperation again breaks down.

Finally, if the *n* members of society are socially diverse, they are likely to have several different notions about what it means to defect or about how they respond to defection. In this event, multilateral punishment cannot be sustained. This violates condition (4), preventing the cooperative equilibrium.

Introducing government ostensibly overcomes all of this. By providing formal enforcement for our interactions with others, centralized coercion both prevents stronger

individuals from plundering us and reduces the risk of interacting with diverse strangers. We can be confident stronger agents and outsiders will not take advantage of us because if they do government will punish them and compel them to pay restitution. State enforcement means that conditions (2)-(4) need not be satisfied for individuals to capture the gains from cooperation. Thus, we get the argument that the scope of spontaneous order is necessarily limited and some authority of command is needed for social coordination.

3 Coordination without Command in Non-Human Societies

Tullock notes that the social dilemma depicted in Figure 1 is not unique to humans. Consider, for example, an ant nest. "The individual ant that just did not do anything, except eat, would also be a free rider. Also the ant that carried out whatever from the ant's standpoint are aesthetic preferences and, let us say, produce things in the nest that it liked, which were not useful for the nest, would be another" (Tullock 1994: 30). In other words, each individual member of an ant society faces the same social dilemma as each individual member of human society. Their dominant "strategy" is to "defect" rather than "cooperate."

Unlike humans, ants and other social non-humans do not have governments to facilitate cooperation. They do not appeal to centralized command to overcome the social dilemma. Remarkably, despite this, each ant left to his own "devices" is somehow able to coordinate his activities into part of a seamless whole that promotes the existence of his ant city.

For example, ant societies use a refined division of labor whereby some ants are "employed" in the collection of food, others the discovery of new avenues of city growth, some specialize in taking care of the young, others are soldiers who guard the city from potential predators, some build and maintain roads between their city and food sources, others yet are porters who carry the food discovered by foragers back to the city. Among the ants engaged in food collection, labor is subdivided further. Some foragers specialize in the procurement of nectar, others "meat" from insects, and still others search for other kinds of food.

Within the ant nest this elaborate division of labor continues. Some "citizens" of the ant city specialize in caring for the eggs and "callows"—new born ants, not yet fully developed. This involves cleaning and feeding the young and moving the eggs around the nest throughout the day to make sure they are kept in the right temperature and humidity so that the embryonic ants they contain do not die. Food production also occurs in the nest. Some ants even "raise livestock (root aphids, if they are kept permanently in the nest), engage in fungus farming, or simply build up large supplies of foodstuffs for the off seasons of the year" (Tullock 1994: 39).

To facilitate the prosperity of their cities, ants "invest" in substantial capital. To farm fungus, for example, ants must collect leaves and grass and convert this into a form of mulch. Once this is done their fungus farms require continual attention to produce. There is also the considerable capital tied up in their nests, which require continual care and greatly increase the efficiency of ant organization. Again, all of this goes on without any central direction from other ants, or any other living thing for that matter.

Surprisingly (or perhaps not in light of ants' incredible coordination under the division of labor), ants have created quite a high "standard of living" cooperating without the direction of authority (Tullock 1994: 32). The average wood ant, for instance, lives more than two years—a stunning achievement in light of its tiny size, which renders it effectively defenseless against predators when outside the nest.

Ant cities can grow to be quite populous. A city might have half a million adult ants, all of whom the city supports on a daily basis. Equally stunning, ant cities do not exist in isolation. They are frequently part or larger ant "nations" composed of multiple cities. When these nations grow too large one or several cities may even secede.

Of course, as Tullock points out, much of the language he uses and I use above attributes purpose to ants, which at least at this stage of our knowledge about them there is no reason to think they actually have. Ants do have small brains, but it seems unlikely they are sufficiently complex to consciously coordinate all of this behavior. Nevertheless, this tremendous coordination occurs without central or hierarchical direction of any kind; ant civilizations are spontaneous orders.

Significantly, these non-human spontaneous orders overcome the very circumstances believed to cause problems for human ones. First, ant societies are populated by members with substantial strength disparities, yet violence is rare. Within ant societies, for example, substantially physically stronger and larger ants engaged in tasks like "protection" do not use their strength superiority to "extort" other nest members only a fraction of their size who are engaged in mold farming (Tullock 1994: 25). Second, members of non-human societies can be significantly heterogeneous—often from different species—creating a variant of the problem of social heterogeneity

discussed above. Despite this, multi-species interaction and coordination is commonplace (Tullock 1994: 2).

Obviously, these obstacles to the application of human spontaneous orders take on a rather different character here. Recall that in the human case, for example, spontaneous order broke down in the presence of social heterogeneity because of communication costs related to conveying the history of cheaters and an inability to coordinate on common understandings/punishment of cheating. For non-human societies, in contrast, the problem of social heterogeneity must be of a somewhat different nature. In the first place, non-humans, such as ants, presumably do not "gossip" to one another like humans or tell one another about who the "good" ants are versus the "bad" ones.

But this does not mean that communication plays no role in their cooperation. For example, Tullock describes an "antler tapping" mode of communication between ants and display of "excitement" to indicate that they have found a new source of food. Ants also leave behind distinct scents that enable them to identify one another. If different species become involved in the ant society, both of these forms of "communication" may become more difficult. Thus, in ant societies too, member heterogeneity should in principle also lead to problems coordinating without command.

Things are similar with the ant version of the threat of violence. In the human case this refers to using one's strength superiority to seize the goods of another. In the case of ants, the problem strength disparities could pose for social cooperation without command is quite similar. Although it is highly unlikely that ants "think" about taking "what they want" from others, there remains the possibility that substantially stronger ants, such as

the "guards," might use their strength to appropriate the food share of the smaller members of their society, such as the fungus farmers.

Although the problems of violence and heterogeneity that are supposed to limit the scope of human spontaneous orders take on a somewhat different flavor for ant societies, it stands to reason that they pose their own "ant versions" of these problems that erect obstacles to non-human spontaneous orders. Evidently, however, these potential obstacles do no cause problems for spontaneous order in the non-human social world. Social cooperation is achieved without command despite the presence of both these allegedly insuperable obstacles to spontaneous order.

4 In Search of the "Human Ant Nest"

Tullock's discussion of spontaneous order's effectiveness in non-human societies despite the threat of violence and problem of heterogeneity presents us with cause to rethink the conventional wisdom about human spontaneous order's ineffectiveness in the face of these obstacles. If ants can surmount these problems and thus come to rely purely on spontaneous orders to coordinate social cooperation, why can't humans?

Tullock suggests a reason. Ants are genetically programmed for cooperation; presumably, humans are not.[6] In non-human social species, natural selection has genetically endowed "agents" with what amounts to a cooperative gene. This genetic inheritance enables them to overcome the social dilemma by biologically directing them to perpetually cooperate.

[6] Although, on this issue see Seabright (2005) and Field (2003), both of whom suggest that at least part of humans' "hardwiring" does pre-program us for cooperation.

Humans, in contrast, are rational and therefore can use their calculative abilities to tabulate the payoffs in Figure 1. This ability is what leads them to defect in this game. Using reason, humans discover that no matter what others do, they maximize their own payoff by shirking cooperation. Further, humans are able to determine that the payoff-maximizing strategy is defection even if spontaneous institutional arrangements, such as multilateral punishment, are present, so long as they are stronger than others or society is socially diverse.

Humans' capacity to reason, however, is a double-edged sword. While it can be the source of conflict identified in the social dilemma, it can also be used as a powerful weapon to overcome obstacles that stand in the way of our ability to cooperate and solve the social dilemma. It stands to reason that something like the "human ant nest"—spontaneous institutional arrangements that promote cooperation in the face of obstacles to these arrangements—might also exist.

Importantly, our search for the "human ant nest" is of more than mere hypothetic interest. If government truly worked as most economists seem to think it does, the state alone could be relied upon as a sufficient solution to the social dilemma in all cases. However, government may not be an effective solution to the social dilemma for at least three reasons.

First, government may be highly predatory and fail to provide the punishment required to coordinate individuals. This is the case, for example, in much of the developing world. Second, it may be prohibitively costly to use government for this purpose. If, for instance, the cost of government, G, exceeds the gains from mutual cooperation, 2α, society will not find it profitable to introduce government for this

purpose, leaving individuals in the Defect-Defect equilibrium (Leeson 2007b). Third, and perhaps most importantly, the state's eye cannot be everywhere all the time. Even where the first two problems are overcome, there remains the simple fact that most of our interactions on a daily basis occur outside the state's shadow. You could, for instance, shoplift in many cases and clearly get away with it. There are not policemen on every corner to prevent this even if they were cost effective and perfectly benevolent. In fact, most parts of the world for most of their history had no governments at all, at least that we would recognize as such.

These three features of "real world" governments mean that our search for the "human ant nest" has practical importance. Since even today, in many parts of the world individuals cannot rely upon government to solve the social dilemma, they must rely on spontaneously-ordered institutional arrangements for this purpose instead (Boettke and Leeson 2006). Further, if these arrangements are to have sufficient scope to support cooperation beyond small homogeneous networks of roughly equally strong people, they must somehow overcome the problems of violent theft and social heterogeneity believed to prevent spontaneous institutional arrangements from working.

4.1 Spontaneous Order in the Presence of Violent Threats

The potential for violent theft results from a strength disparity between individuals. Some individuals are substantially stronger than others, and where this gap is sufficiently large, find it cheaper to forcibly take what they want from others rather than trading for what they desire. This is in large part what has led everyone from Adam Smith to Gordon Tullock to declare the necessity of government. As Adam Smith put it, "It is only under

the shelter of the civil magistrate that the owner of . . . property . . . can sleep a single night in security. He is at all times surrounded by unknown enemies, whom, though he never provoked, he can never appease, and from whose injustice he can be protected only by the powerful arm of the civil magistrate continually held up to chastise it" (1965 [1776]: 670). Spontaneous order alone is insufficient to prevent the strong from plundering the weak.

As noted above, however, Tullock's insightful work on ant nests describes a commandless society in which agents with massive strength disparities are able to cooperate for mutual benefit just fine. Is there anything like this in human affairs?

One needs to look no further than precolonial Africa to find cooperation between individuals of significantly different physical strengths despite the absence of government (Leeson 2007a). In late-19th century Angola there was a flourishing export trade consisting of slaves (before this trade was outlawed in 1836), beeswax, ivory, and wild rubber, for which there was a large foreign (European) demand. These goods were produced by indigenous Africans in the remote interior of west-central Africa.

There were two sides to this export-related trade. On the one side were middlemen and the European agents who employed them to obtain ivory and the rest from interior producers. On the other side of this trade network were the producers themselves. Middlemen were highly mobile, usually armed, and traveled in large caravans. Producers, in contrast, were stationary, typically unarmed, and lived in small villages.

From looking at the records left by producers and middlemen from this period, there is no doubt that middlemen constituted the substantially stronger force in the

interactions between members of these two groups. Indeed, when they could, caravans of middlemen violently plundered interior producers—stealing instead of trading for the goods they desired. However, peaceful trade rather than violent theft characterized the preponderance of these interactions. In fact, the export trade based on producer-middlemen exchange flourished during this time. Angola was one of the largest exporters in the world.

This occurred despite the absence of government in this society. Most of the interior communities of producers were stateless. Even the African "kingdoms" that had more formal rulers were hardly formal from a modern Western perspective. The Europeans (mostly Portuguese) had outposts closer to the coast, but these outposts had no official authority over indigenous communities in the interior. Furthermore, since there was no overarching formal authority to oversee the interactions of individuals from different indigenous or European communities, there existed large ungoverned interstices for the interactions between members of these different groups.

In the face of the threat of violent theft that middlemen's strength superiority presented, producers developed a practice that through expanding use over time was institutionalized without central command to facilitate cooperation with middlemen. Producers had a strong incentive to find a solution to this obstacle to exchange since, largely stationary and cut off from global markets, by themselves they could earn very little. Interactions with middlemen presented an opportunity for greater profits, but also made them vulnerable to violent plunder.

The institution producers employed for this purpose was credit. Normally we think of credit agreements as the cause of potential opportunism. The separation of

payment and provision makes the creditor vulnerable to debtor default. However, in the context of producer-middleman relations it had quite the opposite effect.

The way that credit supported cooperation without command is straightforward. In time *t*, producers would produce effectively nothing. They would leave wax, rubber, and ivory unharvested. When caravans of middlemen looking for goods to steal would travel to outlying interior producers and come upon a village, they would find little to forcibly take. This was problematic from middlemen's perspective, as traveling to the interior tended to be quite costly.

Producers would then offer middlemen the goods they were seeking on credit. Middlemen would pay up front and producers would harvest the goods after the middlemen departed. Middlemen would later return in time $t + 1$ to collect what they were owed. By indebting themselves to stronger middlemen, producers created an incentive for middlemen to avoid physically abusing them and to ensure that other middlemen did not use violence against them. The reason for this is simple. In order to repay what they owed, producers needed to be in alive and in good health. The financial health of the middlemen who provided producers goods on credit became linked to the physical health of producers who were their debtors.

When middlemen returned to collect on the agreement, all that was on hand to plunder was what they were owed. If they wanted more they could either contract a new round of the credit exchange or leave knowing that the next time they returned there would again be nothing to take back to their employers for export. Since visits to the interior were costly, middlemen frequently chose to renew their credit relationships. In this way, credit emerged as a spontaneous institutional arrangement that prevented

violence and enabled both sides to realize the gains from trade despite the absence of government and strength superiority of some members of society.

Notably, these credit arrangements did not create the problem of *ex post* opportunism on the part of producers, which normally attends credit agreements. Given the strength superiority of their creditors, producers knew that if they failed to deliver, middlemen could easily punish them through their greater strength. This spontaneous order solved multiple commitment problems that emerge under the social dilemma at once and in each case substituted cooperation for conflict.

4.2 Spontaneous Order in the Presence of Social Heterogeneity

Contrary to conventional wisdom, socially distant individuals frequently cooperate on a regular basis even where state enforcement is absent (Leeson 2006, 2007c). As Fearon and Laitin (1996) point out, for example, in most of the world where a functioning legal system does not exist or is extremely weak, societies are highly diverse and cooperation is the rule instead of the exception. This constellation of facts suggests that spontaneous institutional arrangements are in fact capable of succeeding in the presence of social heterogeneity. Unfortunately, this has escaped the attention of most economists who continue to argue that social distance poses insuperable obstacles to the operation of these arrangements.

To delve deeper into the effectiveness of spontaneous order in the face of a socially diverse population, the case of precolonial Africa is again instructive. While forms of governance differed widely across the continent and time during this period, a substantial portion of the continent encompassing large numbers of people was

effectively stateless. As much as 25 percent of West Africa, for example, was entirely stateless on the eve of colonization. The Tiv system of Nigeria extended to nearly a million people (Curtin 1995: 71); the Nuer system of the southern Sudan extended to over a quarter million people (Evans-Pritchard 1940); and the Bedouin Arabs throughout Northern Africa were all more or less effectively stateless too (Bohannan 1968: 172). So were areas in Northern Uganda, Karamoja, and the East African River Valley. Many more regions were "quasi-stateless" in that while more formal rulers did exist, they were so weak as to constitute near anarchy.

To benefit from widespread trade the members of diverse communities needed to venture beyond their community networks and interact with outsiders from other tribes. However, in the absence of government, this could be risky since the uncertainty of interacting with others increased as one went outside these bounds. Socially distant outsiders might be honest and thus no problem. But they also might be dishonest.

Given their physical separation and social distance, individuals could not rely upon *ex post* mechanisms of enforcement along the lines discussed in Section 2 to secure cooperation. However, this did not prevent social cooperation and exchange. On the contrary, long before Europeans appeared on the scene in Africa there were extensive domestic trade routes cutting across the continent and exchange relations involved individuals from different tribes who were often complete strangers (Cohen 1969). This directly contradicts the "problem of social heterogeneity" hypothesis as it relates to the effectiveness of spontaneous institutional arrangements.

How did these socially distant strangers overcome the uncertainty of interacting with one another for trade? Instead of using *ex post* punishment to ensure honest conduct,

which would not work in this context for the reasons discussed in Section 2, they used *ex ante* screening that accomplished the same end. In particular, precolonial Africans used social distance-reducing signals to communicate their credibility to outsiders, which in turn enabled inter-group trade (Leeson 2005a, 2005b, 2007c).

Individuals adopted the customs and practices of outsiders they desired to interact with, such as gift giving, ritual taboos related to land, and other such behaviors. They also adopted others' religious practices or converted to their religion, and agreed to follow an outside group's internal mechanisms of governance, such as dispute settlement.

Each of these signals was costly to invest in. Converting to an outsider's religion, for instance, sometimes involved a financial payment. But even when it did not it could involve costly sacrifices of one's personal belongings as part of rituals, restrictions on behavior, such as diet, and continually investing time in religious ceremonies. Similarly, gift giving involved sacrificing a part of one's wealth, the value of which agents could only recoup over time through repeated cooperative interaction with outsiders.

Because the investment cost of these signals could be substantial and was only recoverable through repeated play over time, only those individuals who intended to "be in it for the long haul" with a group of outsiders found it profitable to invest in them. In order to remain in the group's good graces, however, outsiders had to behave cooperatively. If they did not, they could be booted from the group.

As a result, the agents who found these investments worthwhile tended to be those who planned to behave cooperatively. Cheaters, who would be kicked out of the community when they cheated, did not find investing in these signals worthwhile. Their dishonest conduct would result in their removal from the group before they had a chance

to recover the value of their signal investment. In this way, social distance-reducing signals could be used to screen outsiders and ensure that only honest ones were permitted to interact with in-group members. Thus, *ex ante* screening accomplished what *ex post* punishment alone could not. Through this process, social distance-reducing signaling emerged as a spontaneous institutional arrangement that facilitated cooperation in the absence of government and in the face of socially diverse individuals.

5 Concluding Remarks

Gordon Tullock's (1994), *Economics of Non-Human Societies*, is an important contribution not only to economists' understanding of the general features uniting social organization between humans and non-humans, but also to our understanding of the role of spontaneous order in human society, per se. Although Tullock does not see this work as providing lessons regarding human social organization, and certainly does not see it as contributing to an understanding of the workability of anarchy for humans, it points us to instances of human cooperation without command under circumstances in which command is normally thought to be required. In doing so, even if he did not intend it to, Tullock's work on non-human societies encourages us to rethink the scope of spontaneous order in the human world. I have argued that engaging in this enterprise is a fruitful one and have indicated a few instances where I believe the productivity of this enterprise is apparent.

Although the cases I discussed are surely insufficient to change most economists' minds (including Tullock's) about the effective scope of spontaneous order, it should provide some at least a little pause to reconsider their insistence that only command will

work in the contexts described. At the very least, it should shed some additional illumination on the prospect of coordination without command in the human social context. If this is in fact the case, then Tullock's project of examining social organization among non-humans has benefited our appreciation of spontaneous order in the human context despite his claim that it could not do so.

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