Modeling the Evolution of Bureaucracy: Political-Economic Reach and Administrative Complexity

Charles S. Spencer
American Museum of Natural History

ABSTRACT

It is argued that bureaucracy originated when primary (first-generation) states emerged in a context of interacting chiefdoms, without contact with pre-existing states. A model of the transition from chiefdom to primary state highlights the importance of territorial expansion in this evolutionary process. A related issue is how peoples who successfully resist incorporation can help shape the developmental trajectory of an expanding state. A model of the dynamic between an expanding polity and its neighbors suggests that the effectiveness of incorporation is positively related not simply to the size of the expanding polity, but rather to a positive rate of change in the expanding polity's growth relative to that of resisting polities. Variable relationships of incorporation and resistance will cause the shape of the expanding state's growth trajectory to be not regular and symmetric, but instead asymmetric and non-uniform. Empirical data from several cases of primary state formation are consistent with the expectations of the territorial-expansion model. Some practical implications of this model for contemporary considerations of international relations and global sustainability are considered.

The topic of this paper is something that everyone complains about, but nobody seems able to fix. With apologies to Mark Twain, I refer not to the weather, but to bureaucracy. One can hardly deny that we live out our lives in a web of multiple overlapping bureaucracies. Federal, state, local governments – all are bureaucratic. The corporations (both for-profit and non-profit) that

sell us things, entertain us, educate us, insure us, finance our homes, pay our salaries – and sometimes fire us – are bureaucratic as well. Bureaucracy is such a part of our daily existence that it is easy to forget that people have not lived in bureaucratic systems for most of humanity's time on earth.

How can we define bureaucracy? Where and when did it first appear? Might a better understanding of the conditions and processes that gave birth to the first bureaucratic societies provide insight into the nature of bureaucracy itself? Do some inherent features of bureaucracy present special challenges as we strive to formulate strategies of sustainable development in the face of a worrisome future? I will attempt here to take some steps toward answering these questions.

A MODEL OF THE EVOLUTION OF BUREAUCRACY

Notable among early theorists of government was Max Weber (1947), who defined three fundamental types of authority: charismatic, traditional, and rational, the last of which he associated with the bureaucratic state. For Weber, the essence of bureaucratic governance was a hierarchy of administrative offices occupied by full-time specialists with differentiated functions (Albrow 1970). In the latter half of the twentieth century, several evolutionary anthropologists promoted a general framework that was reminiscent of Weber's. Such scholars as Service (1971), Fried (1967), and Flannery (1972) asserted that sociopolitical evolution had tended to proceed through a series of general stages: egalitarian society, chiefdom (or rank society), and state. Flannery (1972) argued that a salient trend in this evolutionary process has been an increase in the complexity of information processing and decision making – in short, regulation. The cultural evolution of chiefdoms and states is a topic that has long attracted – and continues to attract – the active attention of researchers (Bondarenko 2004; Carneiro 1970, 1981, 2010; Claessen 2010, 2011; Claessen and Skalník 1978; Cohen and Service 1978; Drennan and Peterson 2006; Earle 1978, 1987, 1991, 1997, 2011; Feinman and Marcus 1998; Flannery 1999; Flannery and Marcus 2000; Grinin 2011; Grinin and Korotayev 2011; Grinin *et al.* 2004; Johnson 1973; Marcus 1992; Redmond 1994, 1998; Spencer 1987, 1990, 1998, 2010; Spencer and Redmond 2004a; Wright 1977, 1984, 1998, 2006; Wright and Johnson 1975).

Using Weber as a springboard, I propose a framework for the evolution of administrative complexity (Fig. 1). My intention in doing so is not to present a series of static sociopolitical types, but rather to suggest a way of modeling fundamental shifts in regulatory strategies, keeping in mind that simplification is unavoidable in an exercise like this.
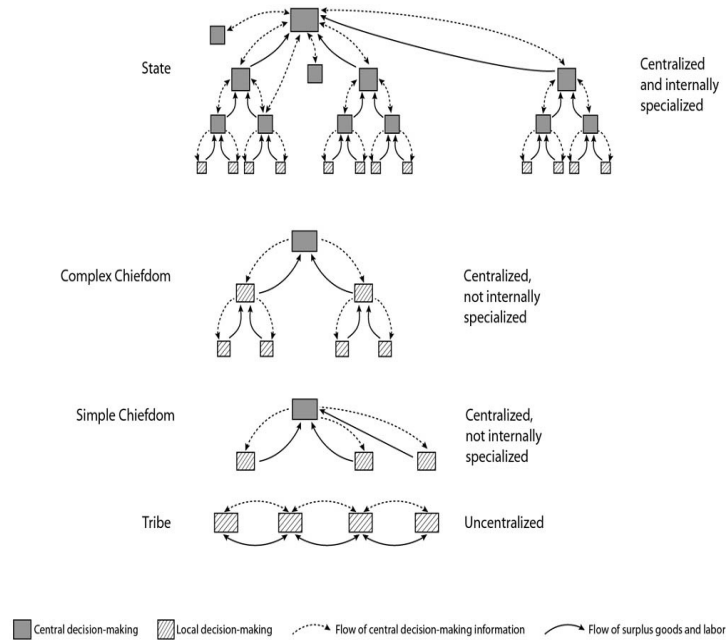

Fig. 1

First, let us envision a situation where political authority is uncentralized and there is no permanent, institutionalized inequality among fundamental social units such as families and villages; this kind of leadership is common in what anthropologists have labeled egalitarian or uncentralized societies. Central authority in these situations is not absent, but it tends to be ephemeral, and the individual leaders that emerge do so because they exhibit unusual personal characteristics like intelligence or bravery that attract followers, along the lines of Weber's charismatic mode of authority. Leadership status is achieved, not ascribed at birth (Fried 1967). Effective decision making often requires key members of constituent social units to come together in periodic aggregations that take

the form of communal feasts, dance societies, village festivals, war parties, ritual fraternities, and the like (Adler and Wilshusen 1990; Drennan 1983; Ford 1968; Marcus and Flannery 1996: 58–59).

Now envision a different kind of administrative strategy, in which authority is permanently centralized in a named office, which exists apart from the person who occupies it and upon his death must be filled by someone of similarly elite descent – leadership in this case is ascribed, often through inheritance, as in Weber's traditional form of authority. At the same time, there is little proliferation of bureaucratic specialists aside from the central leadership office. This kind of leadership strategy is characteristic of the societies that anthropologists have long called chiefdoms or rank societies (Carneiro 1981; Flannery 1972; Fried 1967; Service 1971). Decisions can be made more quickly in chiefdom than they can in uncentralized societies, although chiefly authority is usually much more expensive to maintain. Chiefs support themselves and their retinues through the mobilization of surplus resources within their domain and the management of this political economy is a key touchstone of chiefly success (Earle 1978, 1997; Kirch 1984; Peebles and Kus 1977; Steponaitis 1978). Separate chiefdoms often interact with one another through raiding and/or exchange, but it is uncommon for chiefdoms to engage in the conquest and long-term control of distant territories. Chiefs are known to participate in networks of prestige-good exchange with elites in distant polities, obtaining exotic items that symbolize and reinforce their higher status (Helms 1979; Spencer 1982; Welch 1991).

In a seminal paper, Wright (1977) highlighted some key differences between the administrative strategies that predominate in chiefdoms as opposed to those that are more characteristic of states. He argued that, while chiefdoms tend to pursue administrative strategies that emphasize centralized but not internally specialized authority, states are usually associated with administrative strategies that operate according to a rather different set of rules: centralized and also internally specialized decision-making. Such a design is consistent with the Weberian concept of the rational bureaucracy. In short, chiefly authority is centralized but non-bureaucratic, a design that sees linguistic expression in the relatively few terms employed to designate elite decision-makers in ethnographically and ethnohistorically documented chiefdoms. By contrast, even rela-

tively small states tend to exhibit a plethora of named administrative posts (Spencer 1987, 1990).

From Wright's (1977, 1984, 2006) perspective, the origins of bureaucracy can be found in those cases where chiefdoms evolved into the first pristine states through the process of primary state formation, whereby a first-generation state emerges without contact with preexisting states. There have been few examples of primary state formation worldwide, perhaps no more than six: in Meso-america, Peru, Egypt, Mesopotamia, the Indus River Valley, and China (Service 1975). These cases are an exceptionally valuable resource for comparative analysis and the testing of general models of primary state formation, including the territorial-expansion model that I have previously introduced (Spencer 1998, 2010). I do not wish to imply that the study of second-, third-, or fourth-generation states is a lesser enterprise, but I do think that the empirical record of such states is important for the testing of a different set of theoretical models, ones pertinent to those descendant forms and not to the origination of the state from pre-state antecedents. When a primary state emerges, it does so without any prior examples of state or-ganization to use as a blueprint. So, it is of profound empirical, analytical, and theoretical significance when scholars discover de-velopmental parallels among several independent cases of primary state formation. I therefore disagree with Claessen and Hagesteijn (2012: 13) when they express 'doubt whether the whole concept of primary states (pristine states) has any use at all in the analysis of the emergence of the state'. It seems clear to me that the con-cept – and the empirical record – of primary states must figure importantly in the scientific study of the origin of the state.

Wright (1977) has argued that the different administrative principles that define chiefdoms and states are necessarily associ-ated with correspondingly distinct optimal regulatory strategies. Since central authority in a chiefdom is not permanently divided into multiple specialized parcels, any delegation of chiefly author-ity approaches total delegation, a situation ripe with potential for insubordination, insurrection, or fission. Thus, the optimal strategy for a chief is to avoid delegating authority, which means he has to rule his entire domain from the center. As a consequence, there is a spatial limit to the territory size that a chief can effectively control. In a preindustrial context, this limit seems to lie about one-half day

of travel from the chiefly center, some 25–30 km by foot; a chief, or a chief's representative, could go from the center to the periphery of the domain and back in one day (Hally 1993; Helms 1979; Menzies and Haller 2012; Spencer 1987).

In a state, the central decision-making process is divisible into separate functions that are performed by a variety of administrative specialists usually organized into a hierarchy of at least four tiers, the upper echelons of which set policy while the lower are assigned specific tasks (Wright 1977, 1984). Consequently, the state is able to engage in the effective delegation of partial authority. A state ruler can dispatch subordinates to locations near and far from the state capital to manage local affairs, and, if the authority of the dispatched official has been defined narrowly enough, this can be done with little risk of insurrection (Spencer 1990). The ability to delegate partial authority to subordinates gives a state the potential to intrude into local affairs and finance itself with a variety of extractive techniques. Moreover, the delegation of partial authority allows the state to expand its political-economic territory well beyond the spatial limits associated with chiefly decision-making principles. Wright (1977) has proposed that the optimal regulatory strategy for a state ruler is to engage wholeheartedly in such delegation, to divide and segment authority as much as possible so as to minimize the likelihood of insurrection by subordinates.

One important question concerns the tempo and mode of the shifts in administrative strategy that occur during political evolution. Elsewhere, I have argued that, if a chief tries to implement a new strategy of internal administrative specialization, the chances of success will be enhanced if the shift is made extensively and quickly (Spencer 1990, 1998). Ideally, the new parcels of authority should be defined narrowly enough so that no dispatched administrative assistant in the new order enjoys sufficiently broad authority to 'go rogue' and foment a successful insurrection. In my view, we should expect an evolutionary transition from chiefdom to state to be marked by a qualitative shift in administrative principles and associated optimal regulatory strategies, representing a profoundly transformational process of change. It is worth emphasizing that this perspective takes a processual view of 'bureaucratic governance', seeing it not as a static structure but as a *dynamic regulatory strategy*, the successful implementation of which will probably entail a process of growth and development, usually manifested in

a progression from nascent to fully-developed forms over time. We would expect this shift in regulatory strategy to entail fundamental changes not only in political-administrative principles and procedures, but also in religious ideology and ritual practice, new expressions of which could emerge to help legitimize and reinforce the new political order (Claessen and Hagesteijn 2012; Redmond and Spencer 2008, 2013). Detecting new regulatory strategies in the archaeological record can be challenging, but some researchers have argued that archaeologists might look for clues in certain changes in regional settlement hierarchies and public architecture (Flannery 1998; Flannery and Marcus 1976; Spencer and Redmond 2004a; Wright and Johnson 1975). An example of this approach appears below in my discussion of the early Zapotec state.

I do not maintain that chiefdoms will inevitably evolve into states. Nor do I see either political form as static or invariable. Rather, I join others in noting that chiefdoms exhibit considerable variability and are especially prone to repeated cycles of political growth, marked by an increase in the power and resources (both human and nonhuman) controlled by the chief, followed by a period of decline (Anderson 1994, 1996; Menzies and Haller 2012; Redmond *et al.* 1999). Sometimes this process of growth is associated with the development of a three-tier settlement hierarchy in what are often called complex chiefdoms; in such cases, however, the chiefs at second-tier centers in a complex chiefdom tend to be local leaders and not members of the paramount chief's retinue at the first-tier center (Wright 1984). The growth portion of this cycle is usually financed by increasing resource mobilization, which I have argued is ultimately limited by the territorial constraints on regulatory efficacy that result from the centralized but not internally specialized nature of chiefly decision making (Spencer 1987, 1990, 1998).

In Spencer (1998) I drew upon the work of Prigogine, Allen, and Herman (1977) – and particularly their adaptation of the Lotka-Volterra prey-predator equations in their discussion of dissipative structures – to construct a simple mathematical model of the political economy in a chiefdom. My application suggested that political-economic growth is a logistic (*S*-shaped) process, a consequence of the territorial limits on the regulatory efficacy of chiefdoms. When growth reaches these limits, the system will approach what Prigogine and his colleagues have called a 'bifurcation point'

in its trajectory, a point at which new regulatory strategies must be implemented for the growth trend to be sustained, or else undergo a decline. The latter alternative will produce the pattern of cyclical growth and decline that has been noted for many chiefdoms world-wide. However, a new strategy can lead to a different outcome. One of the most effective of these new strategies would be inter-polity expansion well beyond the limits of chiefly regulatory efficacy, coupled with resource extraction (Algaze 1993, 2004). Outright military conquest is one way this could be accomplished (Redmond and Spencer 2006; Spencer 2003, 2007; Stanish and Levine 2011; Turchin and Gavrilets 2009). Yet, effective subjugation could also be achieved through less violent strategies, including the establishment of exploitative, asymmetrical trade ties that disproportionately favor the expanding polity (Coquery-Vidrovich 2010; L'vova 2004). I use the concept of territorial expansion here in a broad sense, to include variable forms of political-economic domination. It is undeniable that military conquest can be an effective way to expand political-economic territory, but I do not see it as the only way (*cf.* Claessen and Hagesteijn 2012).

In Spencer (1998), I expressed this change in regulatory principles and strategies in mathematical form by adapting the model that Nicolis and Prigogine (1977) had proposed for the emergence of division of labor in ant societies. My approach attempts to model the development in the expanding polity of a specialized administrative branch, whose primary purpose is to collect resources from an adjacent polity. This strategy of expansion of course would be favored when adjacent polities are smaller and weaker than the aggressor. But, such an attempt at expansion would surely be highly experimental in nature and could fail; its success would require a major change in the regulatory principles and strategies of the expanding polity (Wright 2006). Among the most important of the new strategies would be the delegation of partial authority to subordinate administrators who would be stationed in the newly annexed territories to maintain control and manage the extraction and transfer of resources. The political viability of this strategy of delegation requires the implementation of a new principle of administrative organization, one emphasizing the internal specialization of the central decision-making process, as a way of narrowing the breadth of authority possessed by the dispatched administrative assistants, thus undermining their capac-

ity for independent action, such as insurrection or fissioning-off. The essence of this argument is that the success of the territorial-expansion strategy is linked to the onset of bureaucratic governance and the state. Although the nascent state will be more expensive to sustain than the antecedent chiefdom, the new resources gained through successful territorial expansion will do much to defray the costs of the administrative transformation. The growth and proliferation of bureaucratic governance will tend to continue as additional resources are harnessed, which can lead to further delegation of authority, more territorial expansion, and still more resource extraction, a positive-feedback process reinforcing the rise of a state government that is qualitatively and quantitatively more complex and powerful than the preceding chiefdom (see Spencer 2010: 7120). Underlying this statement is the concept of 'deviation-amplifying, mutual-causal processes' (Maruyama 1963), which is perhaps the most appropriate answer to the question recently posed by Claessen and Hagesteijn (2012: 3) in their review of my 2010 paper: 'It is not clear to us from his expose what comes first: the development of a state organization and then, as a consequence, conquests – or the other way around: was the formation of the state a consequence of territorial expansion?' In my model, these two factors co-evolve through a process of mutual causation.

When we apply the territorial-expansion model to the empirical record of primary state formation, we would expect to find a close correspondence in time between the appearance of state institutions and a dramatic expansion of political-economic territory. This expectation, it should be noted, runs counter to the conventional idea that the territorial expansion of state control is a phenomenon that typically occurs well after the initial formation of the state, during what is sometimes called an 'imperial' phase of development. In contrast, my model makes territorial expansion an essential, integral part of the process of primary state formation itself.

Within Mesoamerica, recent research indicates that one of the strongest candidates for a primary state was the Zapotec state, with its capital at Monte Albán in the Oaxaca Valley (Fig. 2) (Blanton 1978; Marcus 2008; Marcus and Flannery 1996; Spencer and Redmond 2004a). Several lines of evidence indicate that state formation occurred in Oaxaca by 300–100 BC (Fig. 3).

Fig. 2

A four-tiered regional settlement hierarchy appeared by the Late Monte Albán I phase (300–100 BC) in the core area of the Valley of Oaxaca, dominated by Monte Albán. Such a four-tiered hierarchy is generally viewed by archaeologists as an evidence of a regional state organization (Balkansky 1998; Marcus and Flannery 1996; Wright 1977). Also, excavations at the El Palenque site, an important sub-regional center near San Martín Tilcajete (Fig. 2), have found evidence of a royal palace (Area I palace) and a multi-room temple (Structure 16), both dated by radiocarbon analysis and ceramics to the Late Monte Albán I phase (300–100 BC) (Spencer and Redmond 2001a, 2004a, 2004b). Oaxaca archaeologists consider the royal palace to be evidence of a specialized ruling class and the multi-room temple to be evidence of a specialized priestly

class, both of which are highly characteristic of state organization (Flannery 1998). More recent excavations at El Palenque have documented additional temples and associated structures, all of which comprise a discrete temple precinct covering some 5,000 m^2 on the east side of the El Palenque plaza (Redmond and Spencer 2013). Like the Area I palace on the plaza's north side, the El Palenque temple precinct dates to the Late Monte Alban I phase (300–100 BC). As of this writing, the Area I palace and the temple precinct at El Palenque are the earliest examples of such institutional architecture excavated thus far in the Valley of Oaxaca (Redmond and Spencer 2008, 2013; Spencer and Redmond 2004a). At Monte Albán itself, buildings of this sort dating to the Late Monte Albán I phase have not yet been found. We have hypothesized that similar structures may lie beneath the massive public buildings that were built in the centuries following 100 BC, as Monte Albán continued to be the capital of the state, and we have suggested that future excavations in the plaza area of Monte Albán should be directed toward the testing of this hypothesis (Spencer 2003; Spencer and Redmond 2004b).

Phase	Tiers in Settlement Hierarchy	Palace	Multiroom Temple	Long Distance Conquests	Valley-wide Integration
MA II	4	Yes	Yes	Yes	Yes
Late MA I	4	Yes	Yes	Yes	No
Early MA I	3	No	No	No	No
Rosario	3	No	No	No	No

(Time scale at left: AD 200, 100 BC, 300 BC, 500 BC, 700 BC)

Fig. 3

Blanton's survey (1978) has shown that Monte Albán reached truly urban proportions by 300–100 BC, with a dense population of about 17,000. By 100 BC, it is clear that numerous and diverse institutional buildings were constructed on the Main Plaza of Monte Albán, providing evidence of an internally differentiated administration (including both secular and religious institutions) that used

the buildings (Flannery and Marcus 1976). One of them is Building J, a monumental construction that features numerous stone slabs with conquest inscriptions, including one that was interpreted by Marcus (1976, 1980) as referring to the Cañada de Cuicatlán, a canyon 80 km north of Monte Albán (Fig. 2). Spencer and Redmond (1997, 2001b) subsequently recovered multiple lines of evidence indicating that the Cañada was conquered around 300 BC and remained under Monte Albán's control until about AD 200. Other researchers (Balkansky 2002; Sherman *et al.* 2010) have since collected additional data on this topic. What has been learned is that Monte Albán expanded its territory first to the north, west, and southwest, while certain nearby polities, to the east and south of Monte Albán, developed into independent states and were able to resist subjugation until the first century BC (Spencer and Redmond 2003, 2006). The result was a pattern of territorial growth that was notably asymmetric (Fig. 4). By the Monte Albán II phase (100 BC – AD 200), Monte Albán had subjugated the resisting polities and reached its full territorial extent (Elson 2007; Marcus and Flannery 1996; Spencer and Redmond 2001a; Spencer *et al.* 2008). It is worth emphasizing that Monte Albán state engaged in some successful long-distance conquests *before* it managed to politically integrate all three branches of the Oaxaca valley itself.

Fig. 4

An interesting question is how peoples who successfully resist incorporation (such as those in the eastern and southern branches of the Oaxaca Valley) might help to shape the developmental trajectory of the expanding state. In Spencer (2006), I drew upon the work of Rashevsky (1968) to construct a simple model of the dynamic between an expanding polity and its neighbors. One outcome of the exercise was that it directed attention to the rate of change in the process of incorporation. In particular, the model implied that the effectiveness of incorporation is positively related not simply to the amount of gross membership in the expanding polity, but rather to a positive rate of change in the expanding polity's population size relative to that of other polities. Applying this model to the Oaxaca case, the graph in Fig. 5 compares relative population sizes in the expanding and resisting sectors of the valley, expressed in terms of the proportions of total valley population, which was growing overall. Effective resistance (which was achieved in the eastern and southern branches of the Oaxaca Valley during the Early Monte Albán I and Late Monte Albán I phases) did not require the recalcitrant polities (bottom line of graph) to grow their populations to an absolute size that exceeded or even closely approached that of the expansionistic polity. Rather, it appears that the expanding polity could be successfully resisted if the recalcitrant polities were able to match the rate of population increase in the expansionistic polity and, at the same time, combine that achievement with other strategies of resistance, which could include population aggregation, defensive construction, and the rapid development of bureaucratic decision-making strategies (Spencer and Redmond 2003, 2006). It appears that the choice faced by a resisting polity is either to get more complex, by developing into an independent state, or be summarily annexed. By Monte Albán II phase (100 BC – AD 200) Oaxaca scholars largely agree that all three branches of the valley were incorporated into the Monte Albán state (Elson 2007; Marcus and Flannery 1996; Spencer and Redmond 2001a).

Because some polities might succeed in mounting an effective resistance for a time while others will not, we would expect the shape of the expanding state's growth trajectory to be not regular and symmetric, but instead quite asymmetric and non-uniform, reflecting these variable relationships of resistance and incorpora-

tion (Fig. 4). At the same time, such a dynamic can be expected to trigger a chain-reaction of independent state development among nearby polities that do not fall directly under the control of the expanding primary state (Balkansky 1998; Spencer and Redmond 2004a). As a consequence, we would expect the bureaucratic form of governance to spread rapidly and widely.
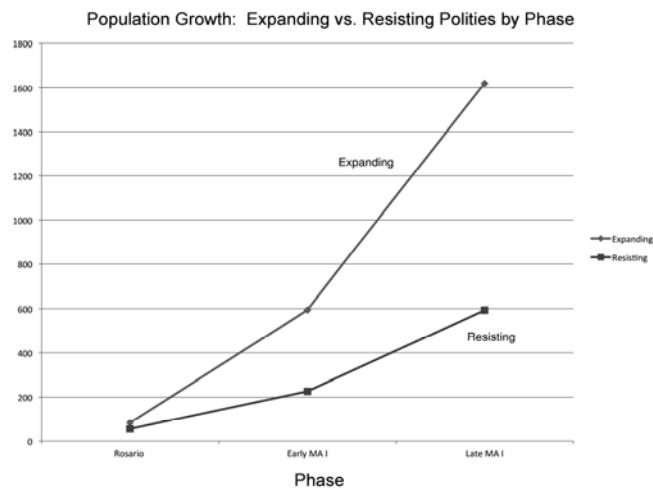

Fig. 5

In Spencer (2010) I examined Monte Albán and five other cases of primary state formation around the world. I concluded that the data from all six cases were consistent with the territorial-expansion model. In Peru, there is evidence that an outpost of the early Gallinazo state was established at Huaca Prieta, located 80 km north of the state capital at the Gallinazo Group, a concentration of large earthen constructions in the Virú Valley (Spencer 2010: fig. 5). A series of recently-obtained radiocarbon dates place the Virú-Gallinazo presence at Huaca Prieta in the first century BC, concurrent with the very early years of the Gallinazo state (Bird and Hyslop 1985; Millaire 2010; Willey 1953). In Egypt, Hierakonpolis emerged as an urban center and a state capital around 3400–3200 BC; at the same time, it expanded its control over much of Upper Egypt, to places like Naqada and Abydos, 80 km and 140 km away (Spencer 2010: fig. 6; Bard 1994; Hoffman *et al.* 1986). In Mesopotamia, the site of Uruk (or Warka) emerged around 3500 BC,

with large and diverse temples and administrative buildings. There is evidence of Uruk outposts in the Susiana plain, some 250 km away, and even farther to the north (Spencer 2010: fig. 7; Algaze 1993, 2004; Johnson 1973; Wright 1998). In the Indus Valley, the site of Mohenjo-daro emerged around 2500 BC as a state capital with diverse public buildings; this development was associated with evidence of the establishment of outposts as far as 400 km away, in the Kutch and Gujarat regions (Spencer 2010: fig. 8; Kenoyer 1991, 2008; Lawler 2008). China's first state was probably the Erlitou state, whose capital was the site of Erlitou, which grew by 1700 BC to urban proportions, with impressive institutional buildings, including at least two large palaces and specialized temple structures. There is contemporaneous evidence of Erlitou expansion to places as distant as Donglongshan, 250 km away (Spencer 2010: fig. 9; Liu 1996; Liu and Chen 2003). In each case, the emergence of the state was concurrent with the expansion of its political-economic territory to areas that lay well beyond a day's round trip from the home region. Moreover, the data indicate that the pattern of territorial growth in each case was notably asymmetric, probably because of variable relationships of acquiescence and resistance between the expanding polity and its neighbors (Spencer 2010).

SOME PRACTICAL MATTERS

In addition to its utility in studying the emergence of primary states, the territorial-expansion model can provide a useful cautionary note as we ponder international relations in our own times. If the bureaucratic state as a political form evolved originally through a process of predatory expansion, then we should not be surprised if states continue to have predatory tendencies, regardless of their particular ideologies. This might be taken as one reason to support the development of supra-national organizations, such as the United Nations, to serve as a check on the expansionistic proclivities of individual states. At the same time, the administration of such a supra-national organization itself is likely to be bureaucratic, so we need to be watchful for predatory behavior there as well. We all know that governments are capable of doing good – even great – things that benefit many, but we need to be mindful of the long-standing predisposition of the bureaucratic state toward

predatory expansion. If, for example, a government attempts to justify unilateral or unprovoked aggression against another country as a novel doctrine – the discredited 'Bush Doctrine' comes quickly to mind, but there are others – we should remember that this is one of the oldest doctrines of all in the long history of the state. I suggest, in short, that bureaucracies are effectively 'hard-wired' by cultural evolution to be predatory. When the bureaucratic decision-making design is adopted by any organization – whether governmental, for-profit, or non-profit entity – we should not be surprised if it engages in predatory behavior.

Another consequence of the territorial-expansion model is that we should expect the dynamic interaction between expanding and resisting polities to foster a positive-feedback loop for growth in both. Unlike the centralized but not bureaucratic chiefly decision-making mode – which I have argued has a built-in limiting factor – the state theoretically has the capacity to expand indefinitely, although the extent to which this capacity is realized will depend on a number of contextual factors, among which is the resistance exerted by recalcitrant polities. The Oaxaca data (Fig. 5) indicate that a resisting polity can withstand incorporation if its growth rate comes close to matching that of the expanding state, even if the latter is much larger in an absolute sense. The expanding polity must find a way to overcome the resisting polities' rate of growth (perhaps, by expanding in a different direction for a while) in order to triumph in the end. It seems clear that such a process would foster a ferocious growth dynamic.

We should expect such a growth imperative to obtain in bureaucratic states, bureaucratic corporations, and any other organizations that adopt the bureaucratic form of decision making. This merits our concern, I suggest, in a world of finite resources and in a time when humans are appropriating an increasingly greater share of those resources. Contemporary politicians often strive to win votes by promoting vigorous economic growth as an ultimate goal. Yet, Daly (1996) has argued that unfettered growth, encouraged by a mentality that he calls 'growthmania', is simply not sustainable in what he refers to as a 'full world', a world with finite resources but with growing human economic systems that are absorbing an ever-larger proportion of global net-primary production (NPP). The percentage of terrestrial NPP currently appropriated by

human beings is estimated to be about 40 per cent of the total (Daly 1996: 57). A bit more than a doubling of the human scale of appropriation would move us very near to 100 per cent – although ecological disaster would surely ensue before we get there. Over the long haul, says Daly, our common goal must be to move towards a steady-state economy on a global scale, the achievement of which will require qualitative development (*i.e.,* improvements in efficiency and quality of life, ideally to be widely shared among nations and social strata) but without overall quantitative growth in resource throughput. There are numerous policies that could contribute toward the goal of development without growth – such as birth control, income redistribution, alternative energy programs, and so forth – but I think the take-home message from this paper is relatively straightforward: *As bureaucrats in policy-making positions endeavor to promote sustainable development, they need to bear in mind that a significant obstacle to sustainability is bureaucracy itself.* The positive-feedback loop between bureaucracy and expansionistic growth must be taken into account along with other positive-feedback loops that promote unsustainable growth. Since my model suggests it is the need for additional resources that encourages bureaucracies to engage in territorial expansion, the obvious policy implication is that the overall costs of bureaucracy must be reduced – but where and how to begin?

In our own system today, a great portion of bureaucratic overhead consists of individual compensation, whether in the private or public sector. Although we hear frequent calls for a drastic reduction in the overall number of bureaucrats (especially in the public sector), an indiscriminate application of this approach would surely have unwelcome consequences, endangering the good outcomes that government and other organizations are capable of achieving, as well as threatening the economy by diminishing aggregate demand, as individuals are thrown out of work. Another way to cut bureaucratic overhead would proceed from the observation that functionaries in the higher levels of a bureaucracy tend to receive vastly higher salaries than those in the lower levels. We are told that this disparity has been increasing in recent years, especially in private-sector organizations, fostering an ever-more-voracious need for such (unevenly distributed) resources (Frank and Cook

1995). To take a step toward reversing this trend, it would be helpful if the compensation of high-level managers could be reduced – and the variance between their compensation and that of lower-level personnel diminished – which would not only reduce bureaucratic overhead, but also help reduce socioeconomic inequality, a related problem that bedevils contemporary society. Of course, such a remedy would require considerable sacrifice by those in positions of power, and would probably have to be initiated by enlightened leaders on the highest policy-making levels who are willing to set a good example and reduce their own compensation – as a noble gesture but, more importantly, as a contribution to the long-term sustainability of human society as a whole.

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