Critical Transitions from Pastoralism to Ranching in Central Africa

Nikolaus Schareika, Christopher Brown, and Mark Moritz

The goal of this paper is to explain why and how increasing commoditization and incorporation in the market economy are only now leading to a critical transition from pastoralism to ranching in Central Africa. While there are similarities between pastoralism and capitalism—in both systems, entrepreneurs are strategically maximizing their "stock"—there are also differences. We argue that these differences can be understood as two distinct types of logic that are embedded within larger sociocultural systems: cattle logic and capital logic. Understanding how these logics operate within different systems is critical for explaining the current shift from pastoralism to ranching in Central Africa. We outline a theoretical model that integrates concepts from practice theory and the literature on critical transitions in social-ecological systems to explain the shift. We illustrate the theoretical model using a case comparison of three different livestock husbandry systems: Woɗaaɓe pastoralists in southeastern Niger, peri-urban Fulani pastoralists in the Far North Region of Cameroon, and Fulani ranchers in the Adamawa Region of Cameroon. We then use these cases to explain the persistence of cattle logic among the Woɗaaɓe in Niger, as well as the shift from cattle logic to capital logic among Fulani in Cameroon. Studying the transition from pastoralism to ranching is important because it has major implications, including increasing economic inequality, weaker community relations, and potential degradation of grazing lands, for livestock husbandry systems in Central Africa.

Taking the train from the capital, Yaoundé, to the city of Ngaoundéré in Cameroon, one sees tens of kilometers of barbed wire along the tracks. What the traveler may let pass by unnoticed as the typical attribute of a rural landscape somewhere else in the world is an indicator of ongoing social and economic transformation in Central Africa. In Cameroon, barbed wire is a sign of a major shift in the management of land, labor, and livestock. Whereas a couple of decades ago, pastoralism was the common livestock husbandry system in the region, now ranching is quickly becoming the alternative toward which cattle owners move. This shift is more than a modification of existing livestock-keeping practices. It entails a reconfiguration of the pastoral social-ecological system. Expected consequences include increasing economic and social differentiation, increasingly individualistic and market-based property regimes, and changes in rangeland management.

Although there are relatively few studies of ranches in West and Central Africa (Boutrais 1983, 1990; Dunbar 1970; Gefu and Gilles 1990), there are many studies of ranches and how these have shaped pastoral ecosystems in East Africa (e.g., BurnSilver, Boone, and Galvin 2003; Galaty 1994) and southern Africa (e.g., Behnke 1984*a*; Bollig, Schnegg, and Wotzka 2013). While there are parallels in the transformation of pastoralism across these regions, their historical trajectories are distinct, particularly with regard to the development of ranches. In East Africa, many ranches were established by white settlers during the colonial period, whereas in Central Africa, the few ranches that developed were started by the colonial state. After independence, the regions continued to follow different trajectories. In Kenya, for example, the government imposed Maasai group ranches with the short-term goal of protecting Maasai landrights and the long-term goal of promoting individual ownership and the sale of land (Galaty 1992). In contrast, in Cameroon, the government did not intervene in pastoralists' landrights and supported open access to grazing resources on national lands (Moritz et al. 2013). However, a growing number of pastoralists have recently established ranches of their own and shifted to a more capitalist production system. It is this autonomous development toward ranching that we aim to explain here.

Despite long-term efforts by governments and development organizations to transform pastoralism into ranching and increasing incorporation into the national and global market economy, pastoralists have long resisted these modernization efforts and persisted in raising family herds by use of common-pool resources, staying at the periphery of markets. Nathan Sayre writes about the long-term efforts of pastoral development projects to modernize livestock husbandry:

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> The goal of such projects, broadly stated, was to transform pastoralists into ranchers: that is, to make both livestock and land into commoditized and exclusively held property (Ingold 1980) whose production and use, in theory, would thereby become (more) economically "optimal." The means of effecting this transformation included land tenure "rationalization," fencing, water development, "improved" breeds of animals, and the imposition of carrying capacities. Despite massive investments from multilateral donors and lenders such as the World Bank, these efforts were almost universally unsuccessful, whether viewed from an economic, environmental, or social perspective (Sandford 1983; Fratkin 1997). (Sayre 2009:705)

While many of those projects may have failed to transform pastoral systems in Africa in the past (Goldschmidt 1981), this is no longer the case in the Adamawa Region of Cameroon, where ranching is quickly becoming the norm. While there have been efforts by the Cameroonian government, the World Bank, and other donors to promote ranching in the region for the past five decades, until recently, these efforts have been mostly embraced by wealthy businessmen, not pastoralists (Boutrais 1983). However, now it is Fulani pastoralists themselves who are making the shift from pastoralism to ranching without support from the government or development organizations. We argue that, while the larger political economy and specifically the commoditization of land, labor, and livestock may be necessary conditions for the observed process, they are not sufficient to account for why the shift is happening right now—after all, commoditization has been around pastoral society for much longer. Rather, we focus our analysis on the process of the change of practical logic from cattle logic to capital logic within a changing sociocultural system to explain why and how increasing commoditization and incorporation in the market economy are only now leading to a critical transition from pastoralism to ranching in Central Africa.

To this end, we outline a theoretical model that integrates concepts from practice theory (Bourdieu 1977) and work on critical transitions in complex systems (Scheffer 2009). The paper builds on the economic anthropology literature on cattle and capitalism in Africa, which has shown that there are remarkable similarities between pastoralism and capitalism, insofar as entrepreneurs in both systems are strategically maximizing their "stock" (Goldschmidt 1974; Schneider 1979). Other studies, in contrast, have emphasized the difference between pastoralism and capitalism and shown how the two socioeconomic orders were connected to each other within hybrid forms by which pastoralists adapted elements from capitalism into their noncapitalist pastoral system (Ferguson 1985; Hutchinson 1996). What we have observed and are trying to explain here is a shift from a predominantly pastoral production system to a predominantly capitalist production system. We argue that pastoralism and capitalism are two distinct systems in which decision-making is guided by two distinct types of logic—cattle logic and capital logic—that are embedded within larger sociocultural systems. In pastoral systems, the everyday interactions and decisions of a cattle owner follow the logic of cattle and are aimed at ensuring the long-term continuity of the lineages of humans and animals. Evans-Pritchard (1940:19) had used the term "bovine idiom" to convey the idea that among the Nuer all social processes and relations are defined in terms of cattle. In capitalist ranching systems, by contrast, a cattle owner follows the logic of capital and makes decisions with the aim of increasing monetary returns on investments. Understanding these logics and how they operate within their respective sociocultural systems is critical for explaining the shift from pastoralism to ranching in Central Africa. While the two systems articulate with each other and merge into hybrid forms, we do note that in the respective systems, one logic is dominant and the other subservient.

We start with a review of the literature on pastoralism and its articulation with capitalism in Africa. Then we outline our theoretical model, which explains the transition from pastoralism to ranching. However, since pastoralism and ranching also continue to coexist in Central Africa, our model also explains the persistence of pastoralism, as well as the dynamic feedbacks between the two coupled systems. We illustrate the theoretical model with a case comparison of three contemporary production systems in Central Africa: Woɗaaɓe pastoralists in southeastern Niger, peri-urban Fulani pastoralists in the Far North Region of Cameroon, and Fulani ranchers in the Adamawa Region of Cameroon. We focus our analysis on Fulani pastoralists in Central Africa because there we have seen a dramatic shift from pastoralism to ranching. This is surprising because Fulani pastoralists in the region have been incorporated in the market economy for centuries (Kerven 1992).

Literature Review

The debate about the economic rationality of African pastoralists started long ago with Herskovits's (1926) paper on the cattle complex in East Africa and continued with the formalist-substantivist debate (e.g., Schneider 1979), Marxist analyses (e.g., Rigby 1985), and institutionalist analyses (e.g., Ensminger 1992). Rather than revisiting these debates, we will briefly review the anthropological literature on cattle and capitalism, which we have organized in three parts: pastoralists as capitalists, pastoralists as noncapitalists, and pastoralists as nascent capitalists.

Pastoralists as Capitalists

In the 1960s and 1970s, a period of intensive ethnographic work on pastoralists in East Africa coincided with the formalist-substantivist debate in economic anthropology. Scholars of pastoralism such as Harold Schneider (1979) and Walter Goldschmidt (1972) used their ethnographic material to portray East African pastoralists as capitalistic herd operators who exhibited a clear profit motive instead of a concern for mere subsistence. Schneider (1979) maintained that "the pastoralist

is not very different from the business speculator in America" (91) and emphasized the congruence between pastoral cattle keeping and entrepreneurial capital investment. Schneider focused his analysis on the exchange of values rather than on cattle as a means of subsistence or a ritual symbol. Cattle were seen as means to ends that realized their potential in various "markets," including the marriage market. Cattle functioned just as capital would, and their exchange followed principles of profit seeking and utility maximization. Schneider conceded that the value, volume, and velocity of trade in pastoralism were small compared with those in a modern capitalist economy but argued that the underlying logic in both systems was quite similar.

This became evident, according to formalist scholars of pastoralism, when a rather unusual trade good, namely, rights over women's labor and reproductive power, was put into the equation. The claim was substantiated with data that demonstrated how East African bridewealth payments followed the supply and demand of women and cattle, respectively (Goldschmidt 1974; Schneider 1979:82). The exchange of cattle for wives exhibited a number of features that emphasize the entrepreneurial and investment-oriented outlook of pastoralists. Moreover, marriage and family development were seen as a conversion of value: wealth in women could be expressed as wealth in cattle and vice versa (Spencer 1998:11). While it is true that relationships built through cattle, women, and children imply many layers of social meaning, morale, and shared history and cannot be reduced to an abstract quantity of cattle, ethnographies of East African pastoralists show that household heads continuously effected these conversions to generate growth in both herd and family. This orientation toward growth through the strategic use of wealth in exchanges and the harnessing of a surplus has led to a perception of pastoralists as people of entrepreneurial spirit who strategically calculate returns on investments made through livestock exchanges (Goldschmidt 1969).

Pastoralists as Noncapitalists

While the parallels between pastoral and capitalist entrepreneurs are striking, other ethnographic studies of pastoralists' incorporation into the market economy indicate that pastoralism and capitalism are very different systems (Hart and Sperling 1987). This becomes most clear in studies that use the concepts of regimes of value, alienation (Comaroff and Comaroff 1990; Ferguson 1985; Hutchinson 1992), and, going back to Bohannan (1955), spheres of exchange.

There are four characteristics of the pastoralist regime of value that suggest that it is not capitalist. First, personal and group identities are vested in cattle through ritual and discursive practice. An animal in pastoral society is "coming from" and "having belonged to" the pastoral family that raised it. Being the embodiment of wealth and social identity at the same time makes it a socially binding medium of exchange. Second, under these circumstances, pastoralists do not handle cattle as an abstract value that is able to enter all sorts of numerical equations (e.g., one cow does not equate to one motorbike). Third, similarly, within the pastoral community there are no or few situations when labor is abstracted from a person's identity and social status to be calculated against an item of commodity exchange. Herding labor is acquired through a "son" who belongs to one's family or kin group. This social fact of reciprocal dependency (as against the individual freedom considered by Simmel [1907]) is made through ceremonies that organize its public recognition by the entire group and involve the exchange of cattle. Fourth, in contrast to capitalism, pastoralists' economic power and creativity are unleashed by processes and institutions that converge reproduction, sociality, labor, means of production, and ownership within a single social configuration. Cattle are the core of this configuration and mediate the connection of its various constituents (cf. Comaroff and Comaroff 1990).

Nevertheless, it is possible that such a configuration can be modified and cattle put on new trajectories. This, however, needs opportunity and effort, as Hutchinson (1996) shows in *Nuer Dilemmas*. Her historical analysis depicts how the social meaning of cattle in Nuer society gradually changed under the influence of British colonial intervention. As the colonial administration auctioned highly requested heifers (collected as fines) only for cash, the Nuer made their entry into market relations and accepted the selling of bulls for exactly this purpose. As the colonial economy grew and diversified over time and increased the amount of cash circulating in the region, the Nuer first seized the opportunities to convert money from wages into cattle and gradually also to get money out of cattle to start businesses. The ease of exchange eventually was such that brides' families accepted cash payment for small parts of the bridewealth (Hutchinson 1996:63–72). However, the evolving commensurability of cattle and money did not undermine the Nuer social system and its underlying logic of exchange between cattle and humans. Rather, the Nuer kept the system intact by defining separate spheres of exchange and corresponding categories of cattle and money. One sphere of exchange was held in the idiom of "blood" and concerned the building of social relations through cattle. The other sphere concerned the partial connection of cattle to markets. Thus, there were the "cattle of girls," which were, as in the olden days, the cattle received by giving daughters as brides. These were difficult to sell because there were multiple and overlapping interests vested into them. Then, however, there were the "cattle of money," which were purchased animals and were less a family's than an individual's property. They could not so easily be claimed by some brother, father, or son as marriage cattle. Most interesting is the invention of the category of "money cattle," which is money that functions as cattle when being offered as part of bridewealth payments (Hutchinson 1996:87). Thus, rather than exercising its brutal work of making anything commensurable with everything else (Simmel 1907), money was tamed as a form of "cattle" and given some limited space in a social system that continued to build on the exchange of lineage animals.

Pastoralists as Nascent Capitalists

During the past three to four decades, globalization has increasingly incorporated African livestock keepers in the world system, with implications for how land, labor, and livestock are managed. The literature indicates that there has been a move of African pastoralism toward capitalism during this period (Bobrow-Strain 2009; Chang and Koster 1994; Rigby 1985; Zaal 1998).

The progressive enclosure of hitherto open pastoral space appears to be a crucial push factor in this direction. Because of land use competition—protected areas (Chatty and Colchester 2002; Neumann 1999), agricultural expansion (Djohy 2017; Mbih et al. 2017; Moritz 2006), land grabbing (Abbink et al. 2014), subdivision of group ranches (Mwangi 2007), and land fragmentation (Galvin 2009)—land has become scarce for pastoralists (Fratkin and Mearns 2003). Consequently, the pastoralist's relationship with land is increasingly taking the form of a tense competition with other users, and land has become an object of economic valuation. It is no longer a given but a cost factor that has to be calculated against its possible returns. The commodification, privatization, and titling of land for pastoral use in Africa (Lesorogol 2003) have become a major form of valuing and allocating land under these new conditions. These processes are pushed by national states and by global development agencies such as the World Bank (Bassett 2009).

Land scarcity facilitates not only the commodification but also the politicization of access to land. Mobile pastoralists, particularly when they are latecomers in relation to autochthons, are increasingly called to justify their claims to land, to recognition as citizens, and to public esteem by how efficiently and sustainably they manage natural resources and by what they contribute not simply to their own subsistence but to the national economy at large (Fratkin and Mearns 2003; Haller et al. 2016). This has led pastoralists to consider the private ownership of grazing land an important, if not quintessential, issue for them.

In conformity with these trends is the growing commoditization of inputs to pastoral production in Africa. Nonmonetized exchange relations between pastoralists offering cattle dung and milk and farmers providing crop residues and grain are well known in West Africa (Ramisch 2005). Monetary payments for services like veterinary care (McCorkle, Mathias, and Schillhorn van Veen 1996) or the building of wells have also been regular elements of the pastoral economy (Thébaud 1990). The situation that pastoralists are facing now, however, is reduced availability of grazing lands combined with the growing availability of commoditized feed on the basis of monetary market exchange (Moritz 2012*b*). Furthermore, the globalization and liberalization of African markets have made new productivity-raising technologies available for cash. These include improved pasture, exotic cattle breeds, pharmaceuticals, mobile communication, and artificial insemination. This means, as we argue below, that pastoralists are induced to calculate the market value of cattle as capital in relation to the market value of feed and other inputs as costs for production and possibly innovation.

Commoditization also concerns the outputs of pastoral production. While pastoralists had been integrated in cattle markets before the advent of colonialism (Kerven 1992), in the past decades, markets for livestock products have assumed a significantly greater importance. Livestock markets have proliferated because of growing demand, particularly from towns. Pastoralists continue to supply these markets, but they have also started to operate on them to make profit out of transport and trading (Hoag 2018; Quarles van Ufford 1999). There is also evidence that pastoralists are tentatively trying to get involved in value chains to increase the possible profit from livestock and their share of it. One strategy is keeping and fattening livestock for slaughter (Adriansen 2006). Another is involvement in the dairy business through cooperatives or contract relations with commercial dairy plants (Wane, Cadilhon, and Yauck 2017).

Market relations increasingly organize labor, too. Salaried herding labor has become a widespread phenomenon (Bassett 1994; Moritz et al. 2015) and an important basis of absentee ownership of livestock (Little 1985; Turner 2009). Pastoralists not only seek income through herding labor but also use wage labor opportunities to diversify their livelihoods and secure their herds by use of earnings in cash (Hampshire 2002).

As pastoralists have increasingly adopted sedentary and urban lifestyles, forms of consumption and social practice have facilitated greater integration in the wider society and in the market. Pastoralists, therefore, strive to make money out of pastoral production to pay for school fees, housing, vehicles, health care, religious duties (e.g., pilgrimage to Mecca), and phones (Casciarri 2009).

Pastoralists respond to the push toward a capitalist livestock economy in different ways. While some actively oppose increasing market integration and seek to keep their pastoral system going (Schareika 2003), others allow for a shift away from pastoralism toward ranching to seize the opportunities of markets and capital investment (Lesorogol 2008). Our theoretical model outlined below explains why and how the shift is taking place now at this pace and scale but also why it is not simply replacing pastoralism.

Theoretical Model

In our theoretical model, we conceptualize pastoralism and ranching as complex systems and make a distinction between two levels at which the shift from pastoralism to ranching occurs. First, at the level of the individual, there is a shift in practical logic from cattle logic to capital logic. Second, at the system level, there is a shift in the management of land, labor, and livestock. There are dynamic feedbacks between these two levels; changes in one level lead to changes in the other level. In addition, there are dynamic feedbacks between the two systems of pastoralism and ranching.

Our theoretical model builds on practice theory (Bourdieu 1977) and complexity theory (Mitchell 2009), in particular the literature on critical transitions (Scheffer 2009), to examine change and continuity in livestock husbandry systems. We use Bourdieu's (1977) theory of practice to explain how individuals pursue livestock husbandry and how this shapes and is shaped by the larger structures within which they are embedded. Key concepts in Bourdieu's theory of practice are habitus and practice. Habitus can be described as an individual's system of acquired dispositions, which work as a generative scheme of action (but do not determine action). Individuals acquire these dispositions, which are embodied and mostly learned through experience, as they are socialized within families, communities, and institutions. Habitus produces practice, which is best described as what people do in everyday life. Practical logic is often described as "the feel for the game," in which the game can stand for social life but also other fields, including economic behavior.

We complement this perspective on the individual actor by using the concept of regime shift to examine system-level dynamics. In the literature on complex systems, regime shift denotes the change from one state or regime to another within an ecosystem or any other system (Scheffer 2009). A classic example of regime shift is when small lakes change from a clear to a turbid state as a result of the runoff of nutrients from nearby agricultural fields. What characterizes these shifts is that they are sudden, often without a major change in the amount of nutrients that enters the lake, and that it is difficult to reverse the process and turn the lake clear again. This type of regime shift is called a critical transition. What makes a critical transition distinct from other kinds of regime shifts is that it is a sudden and dramatic change that is difficult to reverse. Scheffer (2009) also applies the framework of critical transitions to human societies, relying mainly on research in psychology and behavioral economics to explain cultural continuity in terms of sunk cost effects and peer pressure, which promote inertia at the level of the individual and the group, respectively. However, when a critical number of people change their attitude, the result is an "avalanche of individual attitude shifts" (247). In our model, individual practical logic changes when a critical number of an individual's social relations follow the new logic. When a critical number of individuals follow the new logic, there is a tipping point at which change happens abruptly at the system level at an unprecedented pace and scale.

In our model, we see two shifts: one at the level of individual practical logic and another at the level of livestock husbandry systems. The shift in practical logic occurs when, in everyday interactions and decisions, a cattle owner no longer aims at ensuring the long-term continuity of lineages of humans and animals but conceives of cattle as market exchange value, calculates production costs against revenue, acquires production inputs as commodities through markets, and makes decisions with the aim of increasing monetary returns on investments. In figure 1*a* (on the left), this is shown as follows: the system state is the type of logic (on the vertical *Y*-axis), and the conditions are the quality and quantity of the economic interactions that people have every day (on the horizontal *X*-axis). As people increasingly depend on market relations for their livelihoods, they adopt the practical logic that fits the situation: calculating and economizing value by means of money. Pastoralists extend this practical logic to their dealings with the family herd for two reasons. Either animal husbandry has, in a significant way, to be organized through market participation, or individuals start to experiment with production inputs and outputs as commodities. At some point, most of an individual's everyday interactions and decisions follow the logic of capital, and the cattle are managed as capital. The transformation is complete when the individual treats pastures as a commodity and has exclusive access to privately owned rangelands.

At the system level, there will be a sudden and dramatic shift when land, labor, and livestock have become capital for

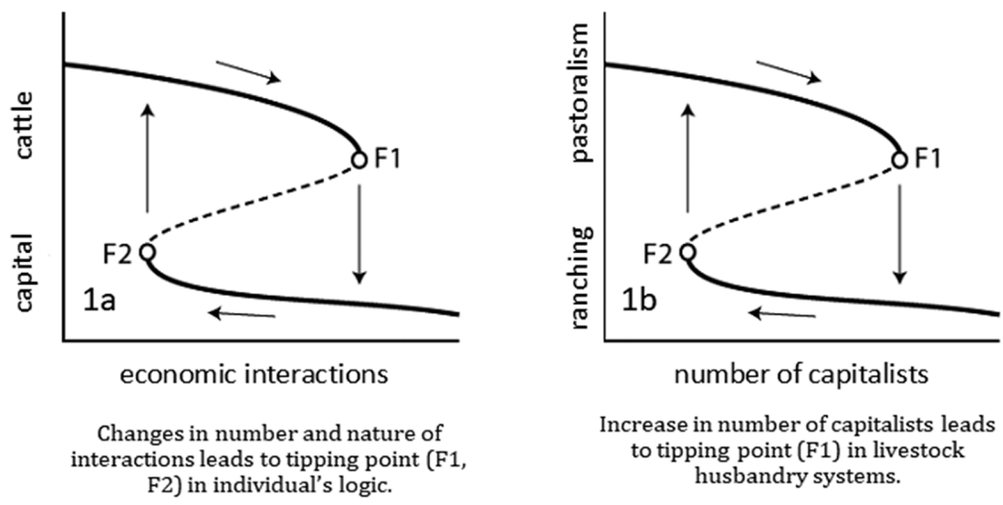

Figure 1. Regime shifts at the individual and system levels.

a critical number of pastoralists. This shift at the system level spurs a reconfiguration of the livestock husbandry system from pastoralism to ranching (cf. Behnke 1984*a*). It occurs when two interrelated processes work together: First, the number of individuals using cattle logic falls below the point where pastoralism as a social and economic system is able to provide a viable environment for a livestock-based livelihood. Second, the number of individuals with capital logic increases to the point where ranching constitutes an effective social and economic environment for any livestock-related activity (see fig. 1*b*, on the right).

Our theoretical model not only explains the shift from pastoralism to ranching but also makes clear why pastoralism continues to persist across Central Africa, even when it is highly integrated in the market economy. Pastoralism and ranching are not simply techniques of managing livestock; they are both highly integrated sociocultural systems. This means that a change in management practices also involves a major change in social values and relations. Because relations within the community are maintained through the livestock husbandry practices of loaning, giving, and inheriting cattle, that is, economic interactions that are not guided by the logic of the market, a change in livestock husbandry practices has direct consequences for community relations. There is thus considerable commitment and social pressure to continue to operate according to the principles of cattle logic within pastoral communities. Similarly, it is difficult for individuals using capital logic on the ranches to return to cattle logic and pastoralism. Their production system constantly creates costs that have to be covered by income subtracted from the herd. Hence, the two system states—cattle logic in pastoralism and capital logic in ranching—are two stable states that are resistant to change. Because individuals are unlikely to make the shift from cattle logic to capital logic when they are embedded in their pastoral community, we suggest that this shift happens more easily when individuals are outside this community, for example, when they move from the bush to the city.

Thus, the first pathway from pastoralism to ranching passes through the city, where the logic of capital prevails (see fig. 2). In the city, the prevailing economic logic is that of the market, and people living in the city engage in multiple economic activities and interactions that are governed by the logic of capital. Individuals who have moved from the bush to the city are more likely drawn into the practical logic of dealing with things as commodities and capital. This explains why we do not see wealthy pastoralists in the bush with 1,000 head of cattle start ranches but do see individuals from a pastoral background who are living in the city start ranches. This explanation is supported by historical evidence that shows that the first private ranches in Cameroon were started by businessmen from the city of Ngaoundéré (Boutrais 1990) as well as by Lesorogol's (2008) study of privatization among the Samburu in Kenya. While these businessmen were from pastoral families, they were no longer embedded in the sociocultural system of pastoralism and used capital logic in their other businesses.

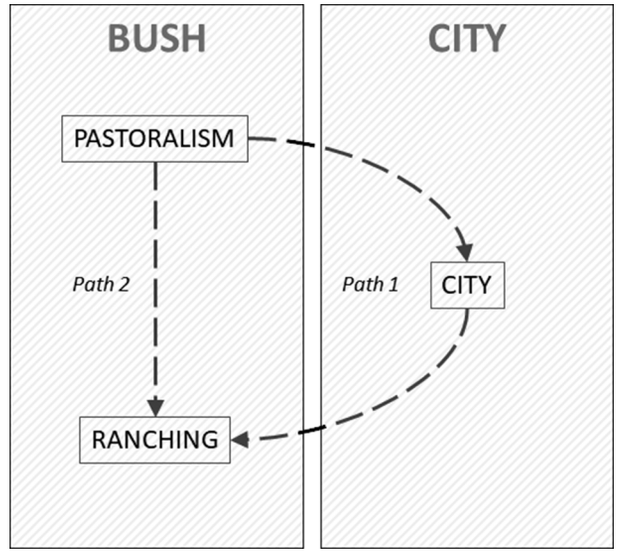

Figure 2. Two pathways from pastoralism to ranching.

For these first ranchers, using the logic of capital in animal husbandry was an obvious next step. Businessmen with pastoral backgrounds use the competitive advantage of being connected to cattle husbandry through nonmarket relations to make business where other, nonpastoralist competitors lack knowledge and networks. That is exactly the advantage of pastoralists turning to capitalism but contradicts, of course, orthodox market ideology. They keep potential competitors at bay because some factors of the livestock husbandry system are not available through markets; they are available through community relations that Fulani ranchers use.

The second pathway from pastoralism to ranching occurs in the bush. As the number of ranches continues to increase in the bush and more and more land, labor, and livestock are managed under the logic of capital, a new pathway from pastoralism to ranching opens up. No longer are economic interactions guided by capital logic limited to the city. The animal husbandry system in the bush is increasingly dominated by the logic of capital: pastures become a commodity and are held as private property by ranchers, herders are hired as employees on the ranches, and animals are bought, raised, and sold as commodities. Pastoralists in the bush thus increasingly become part of a web of economic interactions that are guided by capital logic, and this drives a shift within individuals in the bush from cattle logic to capital logic. These two pathways are associated with two phases in the shift from pastoralism to ranching: a slow and gradual phase when a small number of pastoralists shift to capital logic and a critical transition when the number of ranches in the bush reaches a critical threshold or tipping point.

In summary, our model posits that pastoralists depend on the use of cattle according to cattle logic to build and maintain the institutions quintessential for the management of land, labor, and livestock. It is when pastoralists step out of this

system and increasingly depend on markets for their livelihood, as typically happens in the city, that the facilitating conditions for their shift in practical logic from cattle to capital logic are set. Having pastoral backgrounds but depending on market relations for their livelihood, such people are in the position to start ranching in the bush and managing cattle as capital. As ranches proliferate in the bush, they interfere with the pastoral system there. First, by privatizing and fencing pastures for exclusive use, they push pastoralists out of pastureland and impose their logic of managing land as capital. Pastoralists are then compelled to compete for individual land titles to secure access to land in the future. Second, the management of labor and livestock increasingly follows the logic of capital investment. This changes the economic environment of pastoralists, who are increasingly confronted with the power of capital accumulation on the side of their ranching neighbors.

Case Comparison

We use a case comparison of three livestock husbandry systems in Central Africa to establish the three ideal types of socioeconomic organization discussed within our theoretical model, as follows: (1) Woɗaaɓe pastoralists in southeastern Niger exemplify the cattle logic ideal type, (2) peri-urban Fulani pastoralists in Far North Region, Cameroon, exemplify the cusp of transition from the cattle logic to the capital logic ideal type, and (3) Fulani ranchers in the Adamawa Region, Cameroon, exemplify the capital logic ideal type (see fig. 3). The first two cases have been extensively described elsewhere (Moritz 2008, 2010, 2012*a*, 2012*b*; Schareika 2001, 2003, 2004), while the third case draws from the work of Jean Boutrais (1990, 1991) as well as from our own recent explorations of ranching in the Adamawa and Northwest Regions of Cameroon.

Figure 3. Location of the three case studies.

The cases illustrate the concepts of different forms of practical logic (cattle, capital), the different states of livestock husbandry systems (pastoralism, ranching), and the processes that lead to the shift from one logic and system to another. These processes neither are linear nor necessarily lead to stable states; we caution against seeing this as an evolutionary model.

In using these cases for conceptual work, we do not claim that empirical cases of livestock husbandry are congruent with these ideal types. In real life, one will find different combinations of logics and hybrid systems. For example, capitalist ranching in Nevada builds on nonpaid family labor and cultural meanings of cattle (Derby 1988), just as Woɗaaɓe pastoralists in Niger integrate salaried work in the city into their pastoral system (Loftsdóttir 2008). Moreover, the logics are not always apparent: some ranches in the western United States operate in ways similar to those of the family herds in pastoral systems in that the continuity of the family ranch is the main goal, whereas some cattle herds on transhumance in Central Africa are really managed as capital for profit by wealthy businessmen. Appearances may be deceiving, but we argue that the fundamental difference is the logic of cattle versus the logic of capital, which shape how land, labor, and livestock are managed, and that there are distinct tipping points at which livestock husbandry systems take on entirely new social and economic dynamics.

Woɗaaɓe Pastoralists in Southeastern Niger

The Woɗaaɓe sociocultural system is predicated on the fact that single households have minimal control and no private ownership of the spacious savannah land they depend on for pastoral resources, particularly grass. Families enjoy access to grassland because they are part of a lineage community that for them constitutes a protective and caring net of intimately related supporters in an ecologically variable and politically competitive environment. The lineage community means legal recognition, representation, and right of residence granted by neighboring firstcomer communities and the state. When the state's rule of law is weak or opposes nomads' interests, as often occurs in remote savannah lands, the lineage offers strength through numbers and solidarity (Schareika 2010). Moreover, the sophisticated information needed to drive one's herd over the extensive pastoral landscape is provided through the distributed knowledge and communication system of the lineage (Schareika 2014).

The lineage system had two corollaries to the Woɗaaɓe livestock husbandry system. First, herders had to use wealth, that is, cattle, to build and maintain their position within the social and political network of a lineage community. This usage thoroughly conditioned the economic management of cattle. Second, herders did not use wealth to acquire ownership of grassland as the primary production factor. Looked at from the household level, land lay outside the social world of a

family and its herd (like the ocean surrounding a ship), remaining separate from it. Land was not incorporated into the household unit as property or as a socially meaningful entity.

The opposite was true for the relation between the Woɗaaɓe and cattle. Cattle were intimately and pervasively bound into the organization of human life (Ingold 1986:168). Conceptualizing cattle as capital in the conventional sense of the term suggests procedures of disentanglement and value abstraction that were not discernible in the Woɗaaɓe pastoral system. Cattle were treated here as naturally feeding, reproducing, and behaving herd animals. Human productive intervention was focused on selecting animals (in breeding) and guiding them (in daily and seasonal movements) toward fodder resources. The generation of wealth and income amounted to applying care and taking in as property the output of herd animal metabolism and reproduction, that is, milk and calves.

A calf born to the herd would incorporate the genetic makeup of its parents and ideally continue a line of female cattle coming from a deep past, being handed over to the herder from fathers and forefathers and embodying their pastoral choices and breeding success within the family. The physical and mental characteristics of these cattle (e.g., their beauty, robustness, wildness) would be talked about and remembered in the wider lineage and thus become part of a human family's identity and reputation. A newborn calf, therefore, carried with it the historically formed identity of the herd and family it joined and was not reduced to an abstract unit of value.

As a unit of socially connected, highly mobile herd animals, the family herd constituted a well-trained and ordered collectivity. Woɗaaɓe herding techniques principally built on the fact that the herd was a long-term community of animals (the concept of animals' being habituated to themselves, their particular environment, and "their" human family was here very important).

Crucial to the Woɗaaɓe pastoral system was the intertwining of labor and property. Pastoral labor was predicated on the chance to acquire ownership of cattle in the future. The boys and young men in a family who would drive their father's cattle to pasture or draw water from a well did so knowing that some of the animals had been given to them and that the rest of the herd would be distributed among the brothers after the father's death. Therefore, the allocation of the herd to its herders (i.e., the sons) was what made it grow by thus motivating the sons' work and effort. Since labor was bound to the herd through family relations, it was not flexibly adjusted to its needs and potentials. Rather, endurance (e.g., exhaustingly long working hours), suffering (e.g., hunger), and patience (waiting for better times) cushioned imbalances between herd and family size (Harris [2005:429] on Chayanov's argument for peasant households).

Specialization on cattle as productive wealth and pastoral mobility as an animal production strategy meant that the Woɗaaɓe depended on markets, where through cash they converted animal value into all sorts of goods and services, particularly grain, condiments, clothing, household gear, and equipment. The herders restricted their use of markets to a platform for the conversion of animals into use values. There was no orientation toward the market as an arena of price competition and profit making against other livestock keepers or as a hub for trading. For the Woɗaaɓe, the dominant function of money was therefore that of a simple means of exchange. A typical scenario was as follows: In the morning, a herder would arrive with a bull and no cash in his pocket at the marketplace. The value of the bull would match the planned expenditures. After receiving cash for the sale (which could sometimes last until late in the afternoon), the herder would start shopping and return to his camp with his acquisitions but little or no cash (cf. Braudel [1992] for the distinction between markets as platforms for the exchange of goods and for the generation of monetary profit).

As indicated already with regard to herding labor, cattle were particularly important as a social currency that bound people together by two mechanisms (Dupire 1962; Schareika 2010). The first was the ceremonial act (e.g., ritual slaughter and consumption), by which social facts were publicly established and added to a lineage community's shared knowledge, for example, the fact that a person was another person's wife or son. The second mechanism was the sharing of rights and interests in the same animal among several people. An example is the wife's entitlement to the milk of cows from her husband's herd allotted to her and her (future) children. The people making a lineage community were thus connected through animals in multiple and diverse ways.

Peri-urban Pastoralists in the Far North Region, Cameroon

The case study of a peri-urban pastoral system in the Far North Region of Cameroon illustrates a larger trend of pastoral intensification in Central Africa (Moritz 2010, 2012*b*, 2013). It shows how Fulani pastoralists have intensified their pastoral production system through an increased use of capital inputs bought at the market. Proximity to the urban center of Maroua has driven this intensification process.

The peri-urban village of Wuro Badaberniwol is located in the Diamaré Plains about 10 km east of Maroua, the capital of the Far North Region. The region has one of the highest population densities in Cameroon and is characterized by a great diversity in ethnolinguistic groups and a mosaic of different agricultural and pastoral systems that have been integrated at the household, community, and regional levels for centuries. Most of the Fulani, Riimayɓe, and Kanuri families have lived in the peri-urban village for more than 100 years. The pastoral Fulani households pursued diverse livelihood strategies, including animal husbandry (cattle, sheep, goats, chickens), subsistence agriculture (sorghum, millet, maize), cash crops (cotton), and off-farm income (mainly livestock trade, some retail). They lived in extended households that consisted of multiple nuclear monogamous and polygamous families related through patrilineal kinship ties that shared sorghum and in which the married women took turns preparing meals for the household.

The pastoral households were relatively wealthy; they owned most of their agricultural fields and relied heavily on hired labor for pastoral and agricultural activities.

The intensification of the pastoral production system started only in the past two decades. Increasing urbanization of the city's periphery was accompanied by an expansion of agriculture. Consequently, there were practically no grazing lands in the immediate surroundings of the village, and cattle could not survive on the natural forage alone. Pastoralists adapted to the lack of natural forage in the peri-urban area in two ways. First, they entrusted part of their animals to mobile pastoralists or hired herders who were permanently on transhumance in the extensive grazing lands between the Logone floodplain and the Mindif-Moulvoudaye region. Second, in the dry season they fed the animals remaining in the village (the "village herd") cottonseed cakes, cottonseed hulls, and sorghum stalks that were purchased at the market to compensate for the lack of natural forage. Animals were continually exchanged between the bush and the village herds, depending on the milk and cash needs of the household, labor availability, and the physical state of the animals in the bush herd. This form of peri-urban pastoralism thus involves a combination of intensive and extensive strategies that are fully integrated.

The majority of the pastoral households pursued activities, in particular trade and Koranic scholarship, that took them away from the village. Both of these activities were highly valued within the community. The pastoral households were large extended households that consisted of multiple nuclear families of a father and his sons or brothers. These families were interdependent in some ways (they ate and lived together) and independent in others (each household head pursued his own livelihood strategies). In some cases, these strategies were complementary—one would farm, another would herd, and yet another would trade. In other cases, each household head would farm, herd, and trade—or, better, manage a farm and a herd—as they relied on wage laborers to grow crops and raise livestock. The trade activities consisted mainly of buying and selling livestock or other agricultural commodities. Household heads would buy cattle at a livestock market in the east of the region near Chad, where prices were lower, and sell them across the border in Nigeria, where prices were higher. All these economic activities required considerable money capital, which mostly came from livestock sales and, to a lesser extent, from crop sales. The contrast with the poorer nonpastoral households in the village was stark. They had no access to capital and had limited options for investment in livelihood strategies: they had smaller farms, had no or a few small stock, and were engaged in petty trade.

While cattle provided the capital for investment into other livelihood strategies, the herds were not managed as a commercial business with the goal of maximizing returns on investment. Instead, they were managed as a family endowment destined to be transmitted (as cattle and capital) to the next generation, similar to other pastoralists. Nevertheless, the integration of commodities into the production process, in particular the use of cottonseed cakes and the consequent increase in production costs, led to major changes in property relations within and between households. Traditionally, family herds were amalgamations of animals over which the members of the household and outsiders had a variety of property rights and obligations, but they were managed as a collective good by the household head (Moritz 2012*a*). However, as individual owners of animals were asserting their rights of disposal over their animals in the family herd, that is, the right to sell them and keep the revenues, herd managers started redistributing the costs of cottonseed cakes to individual owners. For individual owners with a sufficient number of animals or other sources of income, this redistribution of costs was not a problem. However, for owners with a few animals and without other sources of income, this posed serious problems; they were forced to sell animals to cover the costs and so endanger their capital. Intensification was an economically viable strategy for someone with 30 cattle but not for someone with only three cattle. The economy of scale thus led to greater differentiation within and between households. The individualization of livestock ownership in the peri-urban community resulted in more exclusive property rights and the concentration of livestock in the hands of one person, namely, the household head.

As a consequence of pastoral intensification, increases in production costs, and the individualization of livestock ownership, livestock exchanges between households disappeared. Pastoralists were more concerned about their immediate family in their extended households than with the larger community of pastoralists in the village. They were competitors rather than collaborators, and this was visible in the everyday life of the small village.

Fulani Ranchers in the Adamawa Region, Cameroon

Ranches in Cameroon are characterized by large pastures, large numbers of animals, private ownership or long-term leases of pastures, clear and demarcated boundaries of the ranch, often with fences, use of salaried personnel, and specialization on one type of livestock. Ranching has changed considerably in the past 100 years (Boutrais 1990, 1991). The first ranches in the Adamawa Region have not evolved out of the pastoral system of Cameroon. The ranches were initiatives of the colonial state and aimed at making profit by modernizing traditional systems of livestock breeding (Boutrais 1990). The ranch was a Western model of animal production to be adapted to West and Central African realities. The Compagnie Pastorale Africaine was the first colonial ranch in Cameroon (Boutrais 1990). The company did not start as a ranch but at first transported cattle from producers in the north to consumers in the south. Then it raised cattle through herding contracts in the Adamawa in the 1920s before establishing a ranch at Goumdjel in the east of the Adamawa Region. The ranch started with 9,000 animals in 1933 and quickly became highly profitable. Later, the company started two other large

ranches and owned between 30,000 and 50,000 animals in total.

The state and, later, businessmen from outside pastoral Fulani society dominated the adaptation of the ranching model in Cameroon. After independence, the Compagnie Pastorale Africaine continued under European ownership and invested in fences, haymaking, and small dams. Supplementary feed was used to increase the weight of animals that were sent to the market. The ranch continued to buy animals from pastoralists in the area and had a large network of buyers who traveled the larger livestock markets in the region to buy animals. In the 1970s, a time when West African countries were importing meat, the Cameroonian government started a number of state ranches, including the Société de Développement et d'Exploitation des Productions Animales, to meet the growing demand for animal products. These so-called industrial ranches specialized in breeding and milk or meat production. However, the production was mostly extensive, although there were more capital inputs than in traditional pastoral systems. An evaluation from the World Bank suggests that the production model of the state ranches was a losing proposition: the costs for feeding the animals exceeded the revenues. The World Bank financially supported the state ranches, but it initiated their privatization when they were not profitable. While the official goal of the privatization was to create family ranches for pastoralists, it set in motion a land grab in which wealthier businessmen were able to gain property rights over rangelands.

Although there are no quantitative data on changes in the size and number of ranches, our observations and accounts from our informants indicate that the development of ranching continues in the Adamawa Region and that the number of ranches has increased substantially in the past decades. In the immediate surroundings of the city of Ngaoundéré, there are now multiple smaller ranches with a few hundred animals and larger ranches with tens of thousands of animals. The ranches, small or large, have a number of characteristics in common that set them apart from pastoral systems. First, the individually owned ranches are commercial investments for making money. There is a systematic effort to increase the productivity of labor and livestock driven by a return on investment logic. Second, ranches own as private capital pastureland and infrastructure such as corrals, watering points, and deticking baths. However, some of the privately owned pastures are very small, and the ranches continue to use communal village pastures as well. Third, the production process is organized through the market: labor is acquired through payments of wages, inputs and technology are bought in specialized markets, and cattle are conceptualized as commodities. Fourth, the livestock husbandry system is "modernized" by the use of improved cattle breeds, intensive use of veterinary care, and the rationalization of herd management (e.g., through objectifying methods of measurement and documentation of animal performance). The production is primarily aimed at increasing production through fattening and reducing the calving interval. Herds are managed with meat production in mind (although there are also a few small ranches aimed at dairy production). Finally, most owners are Fulani and have a pastoral background.

The ranching system articulates with the pastoral system in multiple ways. First, ranches are located next to villages with pastoralists. Second, ranches use village pastures when the privately owned pastures are not sufficient to support their animals. Third, ranches buy many of their cattle from pastoralists or local livestock markets and only fatten them for sale. Fourth, hired herders grew up and learned their herding skills as children in the pastoral system. Fifth, because of the reliance on traditional herding skills, the ranches integrate knowledge of animal keeping derived from pastoral tradition and experience with that derived from animal science and ranch management. Hence, it is the articulation with the pastoral production system that supports ranching through the provision of land, livestock, labor, and knowledge and allows it to externalize a lot of its costs.

Discussion

We illustrated our theoretical model and concepts with cases that were drawn from our respective research projects with pastoralists. However, there is much greater diversity in pastoral systems in Central Africa, and the dynamics of practical logic and livestock husbandry systems are far more complex. In the discussion, we will go beyond the ideal types and explore the implications of our model for understanding current and future trends in livestock husbandry systems in the region.

Beyond Ideal Types

While we argue that our theoretical model explains the shift from pastoralism to ranching, even a quick survey of livestock husbandry systems shows that there is considerable variation in both pastoral and ranching systems beyond the cases described above. Most importantly, pastoral and ranching systems articulate with each other, creating situations of hybridity and contradiction that our theoretical model aims to explain. The scenario is one of a slowly intensifying crisis in which cattle logic and capitalist conditions of livestock production contradict each other up to a transition point where capital logic takes over from cattle logic. The situation after this transition, however, is equally muddled because livestock owners using capital logic find themselves again caught in contradictions.

A key issue is access to and ownership of land. As competition and land privatization make access to pastureland increasingly difficult, pastoralists strive for private ownership and fencing of land to secure access to pasture. Thus, as we explain in our model, pastoralists in the bush are drawn toward ranching and, consequently, capitalist cattle production, as they have to cover the costs of land and related investments from the production of their herd. Already established ranchers, on the other hand, are not able to provide the pastureland

that they need for their livestock year-round. In such situations, they put their herds on communal rangelands and therefore depend on the well-tested system of kinship ties, lineage relations, and networking for access, security, cooperation, and information. Thus, empirically, we do not see neatly divided systems of this or that type but transitory states where either cattle or capital logic dominate.

We should make clear at this point, though, that the use of grazing lands that are not privately owned is a crucial and economically rational strategy of real-world ranching and a deviation only from its ideal type (just as any other externalization of costs scenario in private profit seeking). Sayre (2002), for example, has shown how much ranching in the United States depended on free public range before cattlemen sought legal titles and secured them by fencing (Sheridan 2007). The privatization of pastureland, as he explains, followed from the desire to secure privileged access under conditions of competition among users of the range.

When formerly pastoral livestock owners want to establish private property in land, they realize that the acquisition of rangeland is not simply governed by the laws of the market but rather is a highly politicized issue. Livestock owners are therefore under pressure to organize themselves politically—often in opposition to farmers claiming firstcomer status and a prerogative to land. Unsurprisingly, livestock owners striving for private land titles invoke ethnic identity, shared traditions of living in the bush, common values as people of the cattle, and core symbols of a pastoral culture to organize group solidarity and political impact. This is particularly observable in the pastoral associations such as MBOSCUDA in Cameroon that celebrate Fulani pastoral traditions in order to constitute themselves as a political player and bureaucratic structure. Thus, the very moment cattle logic is abandoned as a guide to pastoral practice, it experiences its renaissance as a decoration to the rancher's enterprise.

The issue of labor also reflects the continuing entanglement of cattle and capital logic. The kind of herding labor that is needed in the open range is neither developed through formal programs of apprenticeship nor made available as conventional wage labor. It is in the context of everyday pastoral practice that children acquire the knowledge and physical endurance of herding under conditions of pastoral resource management. Moreover, they are socialized into a value system in which herding animals are most intimately connected to the aim of building property for the family, the lineage, and, ultimately, oneself. When stock owners recruit herders from this background, they face major problems of trust and motivation. They partly try to overcome this problem by merging cattle and capital logic. Thus, the herder is preferably recruited not from the free market but from the wider family network. The payment is not necessarily in money but can be in animals so that good care for the herd becomes the herder's own interest. By giving food, housing, medical treatment, and sometimes even a wife, the stock owner turns the herder into a dependent and family member rather than a conventional employee, thus forgoing the advantage of market freedom for an enduring relationship of dependency.

Paradoxically, cattle logic is an essential element in the reconfiguration of the pastoral way of life into the wage labor of herding. This is so because owners and herders of cattle are inhabiting two fundamentally different sociocultural worlds. The Fulani ranchers have come to see landed property in the form of the fenced ranch as the foundation of a livestock husbandry system. This is what they need to control first as a stable property, while the animals will come and go. The impoverished Fulani herders without cattle, by contrast, do not see themselves as lacking landed property in the first place. They try to attain a worthy life by getting hold of a little animal property to start a pastoral family herd. Just as "from rags to riches" speeds up the short dreams of hardworking Americans, "from cattle work to cattle wealth" drives countless Fulani, young and old, around Central Africa to find a herd owner in need of their skills. Thus, even though they enter the economic and social world of the land and capital owners who hire them as wage laborers, it is the skills and ideology related to cattle logic that lead them there. When the human career of becoming a herd owner and consequently a socially active person is not fulfilled, cattle logic still helps to uphold a minimum of self-esteem since one is, if not an owner, at least a servant of cattle. The owners of land and cattle capital are of course virtuosic in the parody of cattle logic. In front of their hired herders, they will praise them as Fulani culture heroes who have preserved a real love for the bush and cattle, following the path of the great scouts who had been their fathers and grandfathers. Such short moments of suspended hierarchy in a patron-client relationship can help sustain the hierarchy.

Jean Boutrais's (1999) observations of big ranches run by the state or private investors suggest that the nature of livestock-related labor becomes less pastoral the closer a cattle husbandry system moves toward realizing the ideal model of a ranch. Pastoral activities of humans closely engaging with animals and giving them guidance within an open space are replaced by tasks of handling cattle as objects within an enclosure, such as putting them into deticking baths or counting them. Work on the ranch, while at first embracing pastoral people, activities, and knowledge, may eventually be in contradiction with the type of human-animal relations pastoralism stands for.

The Future of Pastoralism and Ranching in Central Africa

What are the implications of the transition from cattle to capital logic for the future of livestock husbandry, including pastoralism, in Central Africa? Our theoretical model and empirical data point to a number of trends.

At the most general level, one can say that there is a complete shift of the arenas that actors have to enter to compete for the possession of cattle. In our ideal typical case of Woɗaaɓe herding, this arena takes the form of an epic beauty contest.

Beauty is a key concept in the Wodaaɓe approach to the world and the universal currency by which value is measured. Physical male beauty is celebrated during interclan dance festivals as a means of seduction and therefore of bringing wealth in people. The physical beauty of cattle is celebrated as the expression of herding skill and the superb pedigree of inherited cows in endless talks at the campfire; therefore, it is seen as bringing wealth in animals. The beauty of uninhabited bushland is celebrated in migration stories as an achievement of intelligent leadership that has given the community the chance to prosper under the watchful eyes of its migration heroes.

In our ideal typical case of Fulani ranchers, one has to establish control within an entirely different arena to successfully compete for wealth in or through cattle. Private ownership of land is a quintessential prerequisite for a ranch. Hence, livestock owners will shift emphasis from demands for freedom of pastoral movement to ownership of land. This will increasingly take the form of political claim making on the one hand and the exploitation of positions of political influence on the other. The lineage dimension of cattle ownership will become less important, as it is no longer the skills of herding and migration, the inherited pedigree of cows, and the network of lineage mates but the exclusive control of landed property that is of decisive competitive advantage in animal husbandry.

As cattle are integrated as capital into large and complex economies, knowledge, access, control, and creative as well as speculative use of markets will become more and more important to livestock husbandry in West and Central Africa. It may well be that we see something along the lines of John D. Rockefeller's story here. Rockefeller had his company Standard Oil stay out of the risky part of the industry: the production of crude oil. Instead, he concentrated on the refining, transporting, and marketing of oil and thus established firm control over the market and the primary producers (Yergin 2008:35). While on an entirely different scale, the principles of Rockefeller's approach are tentatively appearing in the African livestock economy. Once cattle can be used as capital and commodity, long-term ownership of animal assets per se is no longer an entrepreneurial priority. Cattle capital indeed goes for profit and not for ranching as a goal in itself. What becomes important is control of the most profitable segments of the value chain and then the increase of the turnover there. As the value of cattle products can be manipulated by regulations, standards, nutrition campaigns, and marketing, the future holds considerable potential for mutually colluding politicians, big investors, and entrepreneurs to restructure the African livestock sector such that the primary producers continue to shoulder most of the risks for little income while the big gains are realized between transport and labeling. Thus, once cattle have been disentangled from the pastoral sociocultural system that they hold together through cattle logic and once they have become capital, a scenario resonating with Anna Tsing's (2009) analysis of supply chain capitalism becomes well imaginable. The capitalist in that chain (not necessarily a rancher anymore) would exploit, at little to no cost and for profit, the sociocultural ingenuity of age-old African pastoralism and the risks and strains of African pastoralists by integrating them into the web of commodity and finance flows.

The striking social effect of cattle's becoming capital is the increasing socioeconomic differentiation between wealthy herd owners and poor hired herders. In many ways, the social structure may become more like the patron-client relations in Near Eastern pastoral societies than the egalitarian social structure of African pastoral societies (Barfield 1993; Bradburd 1990). As noted above, among the Fulani, the adaptation of cattle logic serves to bridge the divide between the capital-owning and working classes by providing the latter the dream of a pastoral life in the future or at least pride from work with cattle and a Fulani identity.

However, capital logic is also making a deep impression on Fulani society in Cameroon. Far from simply merging with a putatively universal form of global capitalism, Fulani express the new value they place in individual achievement and in social networks beyond lineage and clan in a number of cultural forms. This would be a topic of its own, but we note here that opulence in housing, educational attainment, and Islamic piety are easy-to-see priorities among the Fulani.

While the ranch is instrumental in bringing about the shift from cattle to capital logic, it is difficult to assess whether it will ultimately be the most cost-efficient form of providing pastureland to livestock. The fact that Cameroonian ranchers rely on open range too extensive for them to own as private property, at least for certain seasons of the year, indicates that pastoralism has some advantages that are hard to match (Niamir-Fuller 1999). Therefore, it is imaginable that capital not simply pushes pastoralism aside through ranching but encapsulates it in the form of peasant pastoralism (Salzman 2004).

Another possibility is that when the number of ranches reaches a critical threshold, the ranch will begin to resemble pastoralism in the way that land, labor, and livestock are managed. One can imagine a scenario in which all pastoralists have become ranchers with their own private rangelands in the Adamawa Region and there are no longer any pastoral communities left to supply the labor and livestock for the ranches or open or common rangelands for ranchers to graze their cattle (because, currently, the privatization and enclosure of grazing lands work only because ranchers also use communal grazing lands). In that scenario, ranchers might have to remove the barbed wire and return to mobile pastoralism on the open range. Lesorogol (2008) has observed a similar process from private to communal ownership among the Samburu in Kenya. The management of labor and livestock would then still be guided by the logic of capital and aimed at profit making, but the system would resemble a traditional extensive rather than a modern intensive system. It remains an empirical question whether the shift from intensive to extensive strategies will lead to changes in the practical logic of Fulani ranchers from capital logic back to cattle logic again.

Conclusion

The critical transition from pastoralism to ranching in the Adamawa Region of Cameroon is unprecedented in terms of its pace and scale, and it raises the question of why Fulani, who persisted for so long in their pastoral practice, are now changing the way that they manage land, labor, and livestock. Our theoretical model draws on practice theory (Bourdieu 1977) and theories of regime shifts in complex systems (Scheffer 2009) and examines the interaction between economic logic at the level of the individual and the larger sociocultural systems in which they are embedded. We used the case studies to show how the embeddedness of cattle logic and capital logic in pastoralism and ranching results in the persistence of these respective livestock husbandry systems. The key to explaining the transition from one logic and system to another is an examination of the everyday practices and social interactions in the different fields of livestock husbandry. We argue that the transition from pastoralism to ranching happens when a critical number of social interactions in everyday husbandry practices follow the logic of capital instead of the logic of cattle. In other words, the critical transition from pastoralism to ranching is driven by shifts in practical logic at the individual level, which are sped up by dynamic feedbacks from the system level. While we focus here on pastoralism, we think that the model is also useful for examining critical transitions in other sociocultural systems.

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Comments

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The task of explaining the origins of capitalism has a lustrous history, from Marx, Durkheim, and Weber to Braudel, Wallerstein, and Polanyi and up to Douglass North. In anthropology, Eric Wolf was well aware of how closely that project is tied to theorizing the nature of precapitalist or "traditional" societies, many of which now seem tenaciously postcapitalist and neither more nor less traditional than anyone else in our globalized world. Schareika, Brown, and Moritz have addressed this great question by focusing on the transition from pastoralism to ranching among diverse Fulfulde-speaking peoples from Niger through Cameroon. They compare three actual societies of livestock keepers, the pastoral Woɗaaɓe, peri-urban herders of northern Cameroon, and Fulani ranchers from Adamawa, demonstrating an impressive command of their economic strategies and motivations and contemporary opportunities and pressures herders experience today. But their real subject of analysis is a theoretical model that purports to explain how these societies in fact represent stages in an evolution from pastoralism to capitalism characterized by "cattle logic" and "capital logic." They combine "practice theory" and "critical transition theory" to explain this transition, the first emphasizing how institutions underlie dispositions to engage in practices that change over time, the second that (often sudden) system-level qualitative transitions can occur as a result of gradual quantitative changes that "tip" the system from one state to another when a threshold is exceeded.

The authors, however, leave undefined what the "logic" in cattle logic and capital logic represents: a central principle of a pastoral or ranching eco-economic system or a defining structure of cognition and perception that underlies human knowledge, motivations, and practices. Pastoralism and ranching are depicted as ideal types contrasting livestock having subsistence and cultural value or exchange and commodity value in market systems. But describing capitalism strictly in terms of commodification and profit orientation ignores that societies with market economies are cultures where kin relations underpin education and jobs, purchases signify prestige, friendship and generosity characterize economic relations, fancy cars function like Nuer cattle, and so on. The authors review intriguing analyses of how pastoralists behave like small-scale capitalists in accumulating capital (livestock), in seeking economic growth (of livestock), and in using diligence and hard work to strengthen the family firm to minimize the dispersion of accumulated capital (livestock), reminiscent of Weber.

The paper emphasizes how market relations distinguish pastoralists producing cattle use values and ranchers producing marketable (cattle) commodities. The two sorts of exchange used to characterize cattle logic and capital logic are noteworthy in anthropology; these are gifts versus commodities, that is, objects of cultural value that establish enduring social ties and are signs of transactors' identities versus objects defined by monetary value wholly transferable by market exchange. But these ideal types blend in practice since symbolic gift things can also serve as commodities and commodities can serve as gift values. But pastoralists are not strangers to markets and, despite colonialist accusations, ignored markets only when prices were controlled at noneconomic levels, an

eminently rational response. Arguably, pastoralists weigh sales against their cash needs, like Chayanov's peasants, but this is mainly a strategy for (cattle) capital accumulation!

Though they are discussed, the paper does not distinguish between three different dynamics influencing pastoral societies: (1) pastoral "development" involving often-subsidized shifts to more productive livestock breeds, veterinary medicine, improved market access, fodder availability, and so on, (2) broader currents of social change or "modernization," including schools, clinics, communications, weaponry, and trade, and (3) the creation of "ranches." The implications of their argument are that ranches represent a destination for pastoralists who are experiencing parameter shifts in population numbers, labor availability, land holding, and market integration through a type of "critical transition" as thresholds are reached in rural societies seen as complex systems. But development and modernization, not ranching, are more pervasive processes defining livestock keepers as small-scale capitalists.

In their account, ranches are privately owned entities aimed at higher returns on investments given their higher productivity, derived from innovations in strategies of infrastructural development, production, and labor use. They observe but do not emphasize that the "large pastures" held by ranches are outcomes of land grabbing by elites, an advantage that cannot be extended to all pastoralists. The economic record of large ranches in Africa, from the colonial period forward, has not been impressive; indeed, if land costs were not discounted, most prove deeply unprofitable. The paper usefully shows that ranches deeply rely on pastoralists for access to common grazing lands (like Western ranchers using public lands), for flows of calves for finishing, and for skilled herders. So the two systems cannot represent stages in a transition from pastoralism to ranching but are part of a larger rangeland system in which ranches serve as part of a value chain in mediating between smaller entrepreneurial pastoralists and major markets.

I am doubtful that "owners and herders of cattle are inhabiting two fundamentally different sociocultural worlds" but recognize the significance of class formation in Africa's drylands and the role of cities and towns for aspirant elites who use political leverage to appropriate pasturelands and market opportunities from common pastoralists. But does the emergence of class-based knowledge, values, and tastes define fundamentally different "sociocultural worlds" when pastoralists and ranchers are usually kinsmen who speak the same languages, often grew up together, and share knowledge of the cattle economy? The paper is especially insightful in sketching out possible futures for Africa's drylands; clearly, livestock and especially cattle are and will be incorporated into complex regional markets and economies influenced by major population centers. If the origin of the notion of "capital" lay in the use of a head (*caput*) of livestock, the nature of cattle as capital will undoubtedly evolve further from small-scale domestic value to large-scale forms of wealth. Whether we will see an interesting reversal from private to commonly held lands remains to be seen, but their final argument usefully sees the fate of small- and large-scale livestock keepers bound together rather than representing stages of a unilinear transition.

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23 IX 19

In this thought-provoking essay, the authors ponder a longstanding question in anthropology—though not explicitly in these terms: What is the relationship between social structure, function, and change? Given that important moments in anthropology's historical debates about structural functionalism were focused on pastoralist peoples on the African continent, the paper is anchored in familiar waters. Direct engagement with that literature might have opened up the essay to additional lines of inquiry, in fact, even if there was little room for doing so in a paper with such an ambitious scope as this.

Focused on Central Africa, the authors propose a model for envisioning how one system of livestock production might become dominant over another. Why, they ask, have some livestock owners been opting for a ranching system that accommodates capitalist production, while others prefer a pastoralist system that resists it? Describing two "practical logics"—capital logic and cattle logic—that structure the decisions of livestock owners, they suggest that these competing and incompatible logics flourish under specific social conditions, eventually leading to a critical transition from one system to another. In a historical moment when social and ecological formations across the globe seem to be teetering on the verge of sudden change, I am grateful for anthropological work that might teach us about the textures and atmospheres of such transitions.

Like any model, the ideal types they develop are not high-fidelity images of a complex social world but abstractions that help organize a messy reality and generate sharpened questions about it. Of course, decades upon decades of social evolutionist discourse about Africa from the North complicate talk about social change on the African continent, even absent any inherent directionality in this particular model. One powerful antidote to evolutionism is descriptive historicism, and in this way those details of the messy reality can come to matter quite a bit. I could not help but wonder, for example, about the shifting structures of power and production or distribution that might operate within the authors' three cases but that are situated outside the two practical logics. What role have federal, local, or foreign governments played in hastening or halting these critical transitions, particularly with regard to changes in land tenure? What of customary authorities? In commonly held rangelands, a transition to ranching would presumably require an erosion of customary authority. Also, what of environmental conditions? Might one practical logic be more sensible under certain environmental regimes—rhythms of rainfall, temperature, phenology, fire, flood, or

drought—in which different livestock traits like heat tolerance, drought tolerance, pest resistance, weight, or milk production are favored? No doubt, there are countless factors that could determine the stability of a given system, not all of which could be addressed in a single model or article.

A second set of questions for me emanates from my substantivist sensibilities in thinking about commodity production and exchange. What kinds of cultural work are required of capital logic? How might old or new ideals of "beauty," status, or exchange morality organize a ranching system that appears at face value to be concerned only with profit? On this point, the voices of herders and livestock owners themselves are vital, and their absence is felt. How do they theorize relationships between what the authors call the "individual level" and the "system level"? What do pastoralists turned ranchers say about their decisions to make such an "autonomous" transition? The most striking aspect of the situation the authors describe, perhaps underemphasized in the paper, is the extent to which a transition from cattle logic to capital logic depends on the existing networks, abilities, and knowledges of cattle logic. It appears that capitalist production through ranching does not structure labor and property regimes in Central Africa as though it were anywhere. Rather, it leverages nonalienated local knowledges in the production of profit much in the way that Anna Tsing (2009) has described the operation of supply chain capitalism. Among the many fascinating questions this raises is what happens if (or when) this parasitic relationship results in the death of the host. Fulani herding knowledge that derives from a pastoralist system surely would not endure under ranching production merely by the circulation of images celebrating herding as a cultural point of reference. Perhaps this represents an important limit of capital logic and one that encourages hysteresis, preventing a complete transition away from cattle logic? A system dominated by capital logic might not displace cattle logic, then, but rather internalize and mobilize it.

At many moments in this essay, I desired a sharper sense of the geography and the rate of change toward ranching, including through quantitative data on land use change, enclosure, the sale of certain livestock commodities, or other indicators. The authors describe it as "unprecedented" in its pace and scale, but they decline to provide a clear account of the rate or extent of this transformation. Understanding this in relation to transitions away from common rangelands toward private land tenure elsewhere, such as in the United Kingdom (Polanyi 1944) or Botswana (Peters 1994), might shed light on the utility of Schareika, Brown, and Moritz's model, the various pathways that transitions between these two systems might take, and the conditions that favor those transitions. This seems like one important avenue for future research. Equally important would be a consideration of the environmental impacts of these changes on livestock production. What might Central African rangelands dominated by capital logic look like?

That the article generates so many questions is a testament to its value. I am grateful to the authors for this provocative essay.

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28 X 19

The Comparison of Cattle-Based Livelihoods

Foundational cultural anthropology research focused on the central role that cattle play in the social and economic life of African pastoralists (e.g., Evans-Pritchard 1940; Herskovits 1926). More recent works examine the lives of pastoralists navigating dramatic changes (Hutchinson 1996; McCabe 2000). This article, through a focus on changing livestock systems in three Central African settings, updates the record with a valuable comparison of cases and sheds light on the transition to capitalist ranching. The authors analyze the structural features (e.g., communal pasture or private property) associated with traditional pastoralism and capitalist ranching, arguing that the spark of transition occurs through the decisions of actors who are guided by cattle- or capital-oriented logics.

I commend the authors for taking on the challenging task of comparing changing livelihoods to better understand regional trends and variations and to engage theoretical questions surrounding livelihood shifts and the effects of capitalism. I learned the value of comparative analysis through my own research in which I drew on Africanist pastoralism literature to better understand the varied forms of cattle raising and associated cultural constructions in a very different context—the Brazilian Amazon (Hoelle 2015). Now, inspired by Schareika, Brown, and Moritz's article, I want to use this commentary to think about a conceptual framework for analyzing shifting cattle-based livelihoods in Africa but also in other parts of the world such as the Americas.

Ingold's (1980) classic *Hunters, Pastoralists and Ranchers* provides a particularly useful starting point. The value of the book stems from his insistence on "precise, theoretically rigorous concepts," which can serve as the foundation for "significant cross-cultural or cross-regional generalizations regarding the similarities and contrasts between specialized animal-based economies" (10). Framed in this way, how could the conceptual framework of this article be adapted and refined so that it could be expanded for broader comparison?

First, what are pastoralism and ranching as conceptual and analytical categories? In this article, these are described as "sociocultural systems," "livestock husbandry systems," "types of socioeconomic organization," and "production systems." For the sake of clarity, it is preferable to stick with one label and to define the attributes of the two types that are being compared. In cultural ecology, adaptive strategy and similar concepts explain how ways of making a living with broadly similar techniques and resources result in similar social and economic patterns across contexts. For now, let us refer to pastoralism and ranching as "modes of livelihood."

Modes of livelihood are often linked with but are not synonymous with modes of production. Pastoralism, for example,

is often associated with subsistence, domestic, or kin-based modes of production, in which social mandates and priorities often organize features of the economic system such as exchange and consumption. However, as the authors show, pastoral systems rarely exist in these pure forms, and many are shifting to something entirely different. These new systems have attributes associated with ranching, a mode of livelihood, and capitalism, a mode of production. At some places in the article, the authors indicate that they are studying the transition from "pastoralism to capitalism," but these are two different analytical categories. And while ranching is often linked with capitalism, there are examples of noncapitalist ranching (Rivière 1972). The more precise framing of the focus is written in different parts but could be combined as the transition from a "noncapitalist pastoral system" to a "capitalist ranching system." As the authors show in this article, typologies are insufficient for explaining the complex and dynamic cases in Central Africa. However, a conceptual framework that distinguishes the mode of livelihood and mode of production can help organize the comparison to better explain real-world transitions from one type to another and overlapping systems.

Overall, this article demonstrates the promise of comparative research as well as the importance of long-term fieldwork in rapidly changing settings where livestock-based livelihoods are shifting. The authors' analysis works for understanding their cases and in the context of a long-standing research tradition on cattle in Africa. The framework could be adapted to other contexts with some modifications to help generate new insights on shifting livelihoods and economic transitions occurring around the world.

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Schareika, Brown, and Moritz address a critical shift that is ongoing throughout many pastoral areas of Africa, as well as in Central Asia and elsewhere. This shift is as old as colonialism but is still very incomplete despite the efforts of many international development agencies and national governments. The article does a thorough and helpful job of describing how raising livestock fits into the larger socioeconomic context of individual pastoralists or ranchers, as well as how the two systems can and do interact. What the article does not do as well—and what has not yet been done satisfactorily—is explain what drives a systemic shift from pastoralism to ranching. The failing is perhaps due to the authors' rather narrow focus on meaning and logic, whether of cattle or capital, while they exclude the thing that is usually used to distinguish pastoralism from ranching: land and who controls it.

In this article, the authors never define either pastoralism or ranching, and this leads to confusion. The most commonly accepted definition of ranching, perhaps best explained by Tim Ingold (1980), is that ranchers own land privately, while pastoralists maintain land as common property or as open access. But rather than focus on how land control—whether de facto or de jure—transitions from common or open access to private, the authors focus on the transition from cattle logic to capital logic. This notion of land as the crux of the pastoralism and ranching divide is not mentioned in the article until the "Discussion," where land shortage is discussed as a driver of the cattle logic to capital logic transition and an explanation for why ranching is being adopted more widely in Africa now. This conclusion is theoretically related to a recent article by one of the same authors that found common property regimes to be correlated with circumscribed land access, while open access regimes are more prevalent where circumscription is absent (Moritz et al. 2019). But because land tenure and access are not the main focus of this article and are largely omitted from the three case studies, it remains unclear how, exactly, pastoralism becomes replaced by ranching. There is thus more work to be done.

The partitioning of commonly held or open access pastures into private ranches is a far more complex process—socially, economically, and legally—than can be explained by a shift to capital logic alone. Private land control is a concept as much as it is a set of legal statutes, and it must be either widely accepted or severely enforced, or else the first fences to be put up will simply be torn down again (e.g., Fortmann 1995). The state and other power brokers clearly play a role here, one that is not adequately acknowledged in the paper. In China, for example, the shift toward private land tenure and the ranching model was driven by state efforts to privatize all land and restrict mobile herding (Gongbuzeren, Li, and Li 2015; Williams 2002), and practices like supplemental feeding occurred only afterward (Li et al. 2019). It is quite relevant that the first ranches created in the Adamawa Region of Cameroon, as described by Schareika, Brown, and Moritz, were created by colonial authorities with the ability to enforce their arbitrary land claims over the preexisting property regime.

Additionally, it is not at all clear to me why capital logic should lead to ranching. The authors associate the adoption of capital logic with the commoditization of land, labor, and livestock, but the three are not necessarily well connected. As the authors acknowledge, it is common practice in some parts of Africa (and in Asia, e.g., Li et al. 2019) for wealthy, often urban businessmen to invest in mobile livestock herds tended by pastoralists. In these cases, livestock and labor have been commoditized, but land has not. It is notable that these businessmen invest in pastoral herds rather than start ranches—buying cattle and paying herders require far less investment than acquiring a ranch, which may not even be possible depending on the regional land tenure system. In eastern Central African Republic, for example, where population density is low, militia activity is high, and property is unstable at best, money is more easily invested in mobile herds (de Vries 2020). In the United States, where private and state property regimes

dominate, livestock investments take the form of ranches or feedlots by default because no pastoral option exists.

I want to acknowledge that the cattle logic versus capital logic distinction does clearly influence how livestock is managed, even if it does not fully explain the emergence of ranches. One way to highlight that transition is to add another livestock system to pastoralism and ranching: the feedlot. I would argue that Schareika, Brown, and Moritz somewhat overestimate the degree to which capital logic dominates among ranchers. Numerous studies have shown that a majority of ranchers in the United States are motivated to ranch for reasons other than money and that many ranches are maintained for cultural, lifestyle, and familial reasons, despite the fact that they generate few profits (e.g., Gentner and Tanaka 2002; Smith and Martin 1972). On ranches, time spent on the land and with the cattle is valued more dearly than economic returns. In contrast, feedlots much more completely embody the capital logic model of raising livestock, in which efficiency and profitability are maximized in the face of unpleasant conditions for both the workers and the animals.

Finally, Schareika, Brown, and Moritz rightfully point to the social harms that a shift from pastoralism to ranching entails, as follows: increasing inequality, loss of access to livestock-based livelihoods, and erosion of social support systems. However, these outcomes also result from increasing commercialization and the adoption of capital logic whether or not ranches are established (e.g., Behnke 1984*b*; Catley and Aklilu 2013). It would be helpful to know how the adoption of ranching—as a land tenure model—compares with the increasing incorporation of pastoral production into market economics when it comes to social well-being and rural livelihoods so that the effects of capitalism can be more clearly separated from those of a shift in the land tenure regime.

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Schareika, Brown, and Moritz have made an important contribution to our understanding of the mechanisms by which pastoralist socioecological systems are transforming into ranching systems in Central Africa. By attending to both (macro) structural conditions and individual (micro) decision-making and agency, the authors move beyond long-standing debates that frame "pastoral development" as a failed top-down modernist project pitting external forces against recalcitrant locals—which indeed it was, over and over again, until by the 1980s even the World Bank had to reconsider. But at least in some places, under some circumstances, the ranching model is now ascendant, despite all of its previous failures and well-known flaws, and even without the prodding or coercion of governments and lending agencies. How? And why now?

While grounded firmly in the authors' empirical research in Niger and Cameroon, the paper addresses theoretical questions of broad and urgent importance in both pastoralist and ranching contexts around the world. The core concepts employed are those of Tim Ingold (1980) in his brilliant if now often overlooked book *Hunters, Pastoralists and Ranchers*: both pastoralists and ranchers possess their animals as private property (unlike hunters), but they differ in their relation to land (held in common among pastoralists, exclusively among ranchers) and the market (ranchers buy inputs and sell animals with an eye to profit; pastoralists rely on "natural" inputs and manage herds primarily for subsistence). Unlike Ingold, however—whose synthetic survey could only speculate on the historical transition from pastoralism to ranching—the authors in this case have been witnesses to it in near-real time. This enables them to complement Ingold's structural analytic with ethnographic insights into the commoditization of land, labor, and livestock production.

The authors' model involves "two distinct types of logic that are embedded within larger sociocultural systems: cattle logic and capital logic." Defined analytically, the two logics map tightly onto pastoralism and ranching, respectively, à la Ingold. But here they are conceived as practical logics in Bourdieu's sense—embodied and performed (as habitus) rather than expressly conceived and consciously executed—and therefore are located at the level of individual actors. Borrowing from complex systems analysis, the authors upscale the model via a positive feedback loop: when a "critical number of an individual's social relations" bear the logic of capital, the individual's practical logic shifts, and when a "critical number of individuals follow the new logic, there is a tipping point at which change happens abruptly at the system level at an unprecedented pace and scale." Specifying the threshold values of these numbers is probably impossible, and the authors do not attempt to do so; the point, rather, is to recognize the "dynamic feedbacks" between the two levels (individual and system) and the two systems (pastoralism and ranching).

The empirical details that the authors adduce to illustrate and support their model are extraordinary. Many are also fundamentally spatial. "The first pathway from pastoralism to ranching passes through the city," for example; migrants from rural pastoral areas can more easily shed their cattle logic and absorb capital logic before returning to the bush, armed with urban cash and empowered by networks in both places. Meanwhile, urbanization also drives market demand for animal products, and it contributes directly and indirectly to land use change, which reduces pastoralists' access to grazing; both processes encourage intensification in livestock production, which may force reliance on market inputs and exclusive control of land. The tool and symbol of the resulting transformation is barbed wire, just as it was in the western United States in the late nineteenth and early twentieth centuries (Netz 2004; Webb 1931). Finally, control of land is both politically and economically expensive, resulting in path dependencies and cultural-symbolic contortions.

Reflected back onto the model, the theoretical ramifications of the three cases are provocative, albeit also somewhat problematic. In the Adamawa Region of Cameroon, ranching has taken over. In the Far North Region of Cameroon, pastoralists have intensified their production and commoditized labor and inputs but not (yet) the land itself. And in southeastern Niger, the cattle logic of pastoralism persists. The spectrum is illustrative but underspecified. It is unclear whether or how one might need the concept of practical logic to distinguish among the cases or to explain why the transition has occurred in the first case and not in the last. And whereas the model predicts a "sudden and dramatic" regime shift from pastoralism to ranching, the middle case appears to be suspended somewhere in between. Granted, individual agency necessarily plays some role in mediating structural change (barbed wire fence does not build itself, after all). But as with other models that rely on positive feedback loops and postulated critical thresholds (e.g., resilience [Walker and Salt 2006] and panarchy [Gunderson and Holling 2002]), inferences seem unavoidably post hoc (the paper's one-paragraph "Conclusion" is circular and tautologous) and ultimately heuristic (the penultimate section, "The Future of Pastoralism and Ranching in Central Africa," is full of important insights and puzzles for further research).

The case studies indicate that one key driver of ranching is scarcity of grazing land (enclosure), which results from urbanization and agricultural conversion as well as fencing built by aspiring ranchers. These processes can presumably be examined empirically. What have been the land use trends in these areas in the past 30-plus years? The case studies further suggest that pastoralism and ranching are not independent at all. In practice, it is all about hybrids, interdependencies, and mutually constituted contradictions: ranchers need pastoralists for their labor, and they need communal lands for their herds; "the very moment cattle logic is abandoned as a guide to pastoral practice, it experiences its renaissance as a decoration to the rancher's enterprise," and in a fully enclosed ranching-only world, "ranchers might have to remove the barbed wire and return to mobile pastoralism on the open range." All these statements apply as much to the western United States as they do to Central Africa. Perhaps what is needed is not a model but a method that can identify both the commonalities and the contingencies in complex empirical situations such as these.

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Pastoralism in Africa is changing. This excellent paper identifies a number of different pathways, focusing in particular on shifts into private ranching. The paper effectively demonstrates how this is happening in Central Africa, focusing on three cases from northern Niger to southern Cameroon. It is an important story and one that challenges us to think about what forms pastoralism takes beyond traditional transhumant systems under capitalism.

The case is made that a "regime transition" is made from distinct "production types" that exist as "stable states" and that this is governed by a shift in "practical logic" shaped by individual behavior. While I do not dispute the empirical evidence—indeed, such changes are evident in many parts of pastoral Africa—the conceptual model is, I suggest, insufficient to explain why such changes are occurring.

As the paper states, the empirical reality does not match up to such a neat model. Hybrid forms exist between so-called traditional pastoralism and other more individualized and commoditized forms of production. With many herds being owned by absentees, a key question is who is a pastoralist, and what is pastoralism today? Indeed, such complex arrangements of ownership, labor hiring, and land use are the norm. As noted, this has emerged through a long process of social differentiation influenced by changing market and political relations (Catley, Lind, and Scoones 2013).

I was surprised, therefore, that the paper focuses on the internal dynamics of transition and changing behaviors and logics rather than on the wider political economy. As Marx (1973) argued, a focus on "concrete" structural features alongside specific livelihood practices—the "many determinations and relations"—is important. Despite the focus on social differentiation, there was no mention of class, gender, or generation. Asking about the deeper processes at the heart of transitions to capitalism in agrarian societies should be a starting point (Edelman and Wolford 2017). Different paths of incorporation into a capitalist economy emerge depending on the configuration of class interests and the dynamics of accumulation (Bernstein 2010). As empirical work in critical agrarian studies has long shown, there are often hybrid forms, as the transformation of the peasantry into capitalist and proletarian classes is uneven. Indeed, as Bernstein (2006) highlights, "fragmented classes of labour" frequently emerge in agrarian societies in transition.

While, as the paper notes, there is an older tradition of work on pastoralism that explores the articulation of livestock-keeping societies with capitalism (Schneider 1979) and indeed the importance of understanding cattle literally as "stock" (Turner 2009), most studies of pastoralism have not examined change in these terms, preferring instead to focus on the more microlevel patterns of change in ecologies, economic behavior, institutions, and social relations. This paper, too, perhaps reflects this disciplinary bias.

In examining livelihood change, however, it is essential to connect these more detailed microanalyses with a wider structural political economy perspective, putting issues of social difference at the center (Scoones 2015). This is perhaps especially important for pastoralism given major shifts in access to

and control over resources precipitated through enclosure, investment, and commoditization (Lind, Okwena, and Scoones 2020). This has resulted in significant differentiation in pastoral areas, with some able to "move up" while many are forced to "move out" (Catley and Aklilu 2013). This is a far cry from the stable egalitarian picture of pastoral societies painted by the romanticized ethnographies of the past. Today's settings require a different type of analysis.

How might this be applied to the cases here? First, we would need to know more about the political economy and ecology context of the cases. They span very different political-economic and agroecological settings. The basic incentives to invest in privatizing land differ dramatically. For example, you might expect enclosed ranching to be more common in the wetter areas, as observed. Distributions of herd sizes matter, too. Only when herders have more than around 10 animals is a commercial herd feasible (Behnke 1987). What were the patterns of ownership across cases, and how did this affect choices? We also must ask about who is able to enclose and get away with it. The politics of elite capture and processes of "land grabbing" have been widely studied in pastoral areas. It is only a few who are able to stake such claims, establish fences, and exclude others (Galaty 2013).

Such people may possess a "capital logic," but, as the paper hints, this is not fixed. Whether it is by hired herders or owners themselves, diverse knowledges and practices are deployed. While there can be an appearance of a ranch—with paddocks and the rest—the underlying functioning may be very different from that of ranches in the western United States, for example. In practice, to survive in the challenging, variable environments of the drylands, core principles of dryland pastoralism must be applied. This may involve new forms of mobility—moving fodder or water rather than animals, for example—as well as attuned adjustments of herd size, structure, and location. In response to uncertainties in pastoral settings around the world, such adaptations are occurring through innovations in practice, technology, and institutions (Nori and Scoones 2019). A ranch may look different from traditional pastoralism, but actually the practical logics are often similar.

In this view, pastoralism and ranching are not distinct "systems," and a focus on the "ideal types" may mislead. Cattle and capital logics are intimately intertwined, and hybrid forms inevitably emerge. To understand how change happens—not in terms of a singular transition but a longer-term, more complex transformation—the analytical focus must shift from categories, states, or types to relations and processes (Scoones et al. 2018). New, usually hybrid systems are always coconstructed through the constant dialectic between multiple livelihood determinations and more concrete structural features. A relational approach to class, gender, generation, and ethnicity is therefore essential. In my view, therefore, only by drawing on a critical agrarian studies lens for pastoral settings will the important question posed by the paper, of why forms of capitalist livestock production are emerging in Africa's pastoral areas, be fully answered.

Reply

First and foremost, we want to thank our colleagues for their critical, thought-provoking comments. As they note, our paper builds on a long scholarly tradition that seeks to explain the nature and origins of capitalist economies, and we share the view that studies of economic transitions in contemporary pastoralist societies continue to yield rich insights in this regard. We also share the commentators' view that the ambitious scope of this project, as well as the expansive literature on the topic, raises challenging conceptual and theoretical concerns that must be addressed—notably, the difficulty of formulating precise conceptual definitions distinguishing analytic categories that are empirically interrelated and mutually constitutive and the task of developing a theoretical framework capable of accounting for the multiplicity of factors, inputs, and relationships. While we make no claim to having resolved these challenges, we nevertheless believe that our model makes a substantive contribution to long-standing questions regarding the shift—and the lack thereof—from pastoralism to ranching in Central Africa, and we are glad that, in general, our colleagues seem to agree. Below, we address several of the points that they raise by clarifying the contributions and limitations of our model and reflecting on its implications for future research.

Model Contributions

The paradox that we seek to explain is the unexpected shift from pastoralism to ranching in Central Africa after decades of failed development efforts to "modernize" livestock husbandry systems in Africa. Whereas previous analyses have focused on the exogenous drivers of change in pastoral systems, our model focused on endogenous drivers of change to explain the transition from pastoralism to ranching. In this way, we build on scholarship that puts pastoralists themselves at the center of analysis, as active agents of change rather than passive recipients of development (Catley, Lind, and Scoones 2013).

Yet we do not believe that such a focus on agency necessarily comes at the expense of a broad contextual analysis accounting for multiple factors. Taking practice theory as our point of departure, we theorize that the shifting patterns of practical logic that guide economic decision-making among Central African pastoralists reflect, in a general sense, their embeddedness in various institutional structures and ecological conditions. Thus, rather than neglecting broader aspects of political economy or the undeniable importance of factors such as land tenure, our model integrates the cumulative effects of complex structural factors and helps to explain how and why structural change translates into specific changes in economic ideas and behavior. More specifically, the model suggests that to understand why previous attempts to use policy and legal measures to force pastoralists into capitalist markets have failed and why pastoralists are now themselves making a decision to engage in capitalist production, we must conceptualize the interplay of

cattle and capital logic within a complex system governed by its own internal dynamics. It is in this sense that the "narrow focus on meaning and logic" (Hruska) offers a new and widely applicable model of regime shifts in pastoralist societies that accounts for agency and system dynamics alongside (rather than in lieu of) structural factors.

Our model analyzes these dynamic processes and the mechanisms that link them at two levels: the individual and the system. At the individual level, we used practice theory to explain how the practical logic of cattle and capital informs how pastoralists and ranchers manage land, labor, and livestock in pastoral and ranching systems. We argue that pastoralists use cattle logic, which is aimed at ensuring the long-term continuity of the lineages of humans and animals, whereas ranchers use capital logic, which is aimed at increasing monetary returns on investments. At the individual level, we use a complex systems approach to explain how individual pastoralists shift from cattle logic to capital logic when a critical number of their social interactions follow the logic of capital. At the system level, we envision a similar critical transition when the number of ranches reaches a tipping point.

The concepts of cattle and capital logic allowed us to see that as pastoralists creatively engage with their social and ecological environment, their individual choices contribute to an emergent dynamic that limits the scope of future action. These limits have two effects. First, they produce a number of recurring patterns in pastoralists' livelihood systems—patterns documented widely in the anthropological literature. Second, under particular conditions—we show them for the case of Central Africa—they conflict with the opportunities and needs of a new situation in such a way that the pastoralist system undergoes a paradigmatic shift. In this scenario, pastoralists reorient their values, interests, and strategies in a way that does not simply constitute a change in their response to the world but fundamentally changes what this world looks like to them. This explains the dynamic feedbacks we describe in the regime shift at the system level: the more pastoralists organize their economic and social relations through capital logic, the more capitalist livestock production becomes the reality they must live with. Thus, by examining how pastoralists' use of practical logic produces systemic feedback loops, we move beyond unilinear models of cause and effect, establishing pastoral society itself at the center of a transformative activity of which it is subject and object at the same time.

We therefore believe that introducing the ideal type concepts of cattle and capital logic was a crucial step in the development of the model. It allowed us to theorize pastoralists' economic agency by situating them within a variety of complex scenarios and enabled us to think of pastoralists as strategic agents operating within fields of shifting values, interests, and perspectives. In this way, taking account of sociocultural complexity and variability at the level of detailed ethnography did not entail that we forgo chances for generalizable explanation and prediction. Nevertheless, we fully recognize that we have devised these concepts as ideal types; they thus do not neatly correspond—as that is not their epistemological function—to an empirical reality in which ranchers depend on cattle logic and pastoralists rely on commoditized inputs. This "messiness" undoubtedly confounds efforts to form precise analytic categories and thus requires us to make some clarifications regarding our conceptual framework.

First, the distinction that we make between pastoralism and ranching is not a matter of production for subsistence versus production for the market. Pastoralists in West and Central Africa have indeed been embedded in the market economy and have been selling livestock and livestock products for centuries (Kerven 1992). Second, the model is specifically concerned with practical logic as it relates to the management of land, labor, and livestock in animal husbandry systems. It focuses on the shift from cattle logic to capital logic in the domain of livestock husbandry and should not be taken to imply that as ranching increases, capital logic comes to pervade all aspects of the social worlds inhabited by pastoralists and ranchers. Third, the distinction between cattle logic and capital logic highlights a distinction between two contrasting goals: long-term continuity of the lineages of humans and animals versus increasing monetary returns on capital investments. In the first case, cattle are extensively but by no means exclusively used as gifts; in the second case, the use of cattle as commodities predominates, but their use as social currency and signifiers of social meaning is still possible. We hope that these clarifications help to dispel any impression that we have set these logics as excluding each other (on the contrary, they articulate in numerous ways) or that we see pastoralism and ranching as stages of livestock husbandry systems in a unilineal transition.

Model Limitations

One of the main limitations of the model is that it is too simple to fully explain how larger issues of political economy impact transitions to ranching or to fully resolve conceptual tension between ideal types and empirical complexity. Nevertheless, as several commentators indicate, we believe that this simplicity is also the source of the model's strength as a heuristic device.

The model is not sufficient in explaining the transition to ranching because it occurs within a political economy that includes increasing and changing forms of market integration, technological and infrastructural innovation, globalization, urbanization, new forms of rural-urban links, social differentiation, government and development interventions, and insecurity and migration. Moreover, the growth of the number of ranches is partially attributable to land grabbing by elites, which further accelerates the transition from pastoralism to ranching. Although we described this mechanism in the paper, we did not emphasize the political dimension of the process. In that sense, our model needs to be improved by explicitly integrating variables related to political economy. Still, we contend that the purpose of the current model is not to isolate variables or offer detailed explanations of the role of specific

factors (e.g., land tenure, traditional authorities). Rather, it analyzes regime shifts at a level of abstraction in which the shifting balance between cattle and capital logic serves as a proxy for the aggregate effects of structural factors on decision-making processes related to animal husbandry. Thus, while the model does not offer cause and effect explanations of the impact of specific drivers, it does demonstrate the importance of emergent system dynamics in shaping the trajectory of regime shifts and suggests that this dynamic goes a long way in explaining why the transition to ranching in Central Africa is occurring now instead of after past attempts to impose market rationalization through external coercion.

While our three case studies were introduced as illustrations of our ideal types, we have to concede that pastoralism in Central Africa is characterized by considerably more diversity, dynamics, and complexity than could be dealt with in our paper. Moreover, when we look beyond Central Africa, the categories of pastoralism and capitalist ranching become even more problematic, as noncapitalist subsistence ranching in northern Brazil (Rivière 1972), family ranches in the western United States (Wilmer and Fernandez-Gimenez 2016), and capitalist absentee herd owners in East Africa (Little 1985) amply attest. These examples, along with others referenced by the commentators, suggest that the notions of pastoralism and ranching, even though they have been enormously helpful and productive in guiding research, must not blind us to recognizing the diversity and dynamics across livestock husbandry systems. These systems are multidimensional (e.g., social, cultural, economic), and, depending on what dimensions one considers, any given system could conceivably be labeled pastoralism or ranching. It may indeed be time to critically and thoroughly reexamine these categories.

Despite its limitations, the model is useful as a heuristic tool to examine integration, hybridity, and interdependencies between systems because it allows us to describe and explain an empirical reality that is so much more complex. In this regard, it helps us to organize "a messy reality and generate sharpened questions about it" (Hoag) and to generate "puzzles for further research" (Sayre), not just in Central Africa but also elsewhere. Thus, our model offers a new lens to study the old problem of the nature of economies and their transformations, a claim that is borne out by the responses of our colleagues and the important questions they raise regarding the implications of our model for future research.

Next Steps

We consider this paper to be the first step; clearly, much theoretical and empirical work remains. One of the main challenges is that, while everyone agrees that there are qualitative differences between pastoralism and ranching, it is almost impossible to demarcate clear-cut boundaries between the two categories when studying livestock husbandry systems around the world. Of course, as mentioned above, this challenge also offers exciting opportunities for further research.

Several commentators rightly bring up Tim Ingold's (1980) work on hunting, herding, and ranching. Ingold emphasizes, as we do, a fundamental difference between pastoral and ranching economies and explains them with the concept of capital (228). He examines the transformation of one system into the other while stressing the analytic value of treating them as distinct types. Reviewing the literature, he notes:

> It is perhaps understandable that ranching peoples have, at least until recently, received very little positive attention or sympathy from anthropologists, for they may be held directly responsible for the obliteration of native cultures from large areas of the globe, including much of North and South America, southern Africa, and Australia. But their neglect is unfortunate, since a comparison with ranching could greatly enhance our comprehension of the nature of pastoralism. (Ingold 1980:235)

With several distinguished experts on ranching as our commentators, we are happy to see this situation considerably changed since Ingold's seminal work. Indeed, one of the main goals of this paper is to facilitate comparative perspectives and critical dialogue between scholars of pastoralism and ranching.

Using the critical feedback from our colleagues, we envision the following next steps in the study of the diversity and dynamics of livestock husbandry systems: (1) conduct more empirical research to evaluate our model and examine the pace and extent of transitions from pastoralism to ranching in Central Africa, for example, spatial analysis of the extent of ranches, livestock distribution across pastoral and ranching sectors, interdependencies between pastoral and ranching sectors, and studying the perspectives of pastoralists and ranchers on these transitions, (2) integrate political and economic structures into the model and examine how the distribution of social, symbolic, and economic capital shapes the transition, for example, whether pastoralists with larger herds, larger networks, or more schooling are more likely to make the transition to ranching, (3) further develop our model to explain not just the transition from pastoralism to ranching but also the persistence of pastoralism in Central Africa and elsewhere, (4) further explore the different dimensions of pastoralism and ranching, for example, examine the similarities and differences between pastoral families in Cameroon and family ranches in the US West, (5) examine what the impacts of the transition from pastoralism to ranching are for social-ecological systems, and (6) examine whether and how ranchers may shift from capital logic back to cattle logic or other practical logics that result in more sustainable and equitable livestock husbandry systems. We hope that other scholars will join us in this endeavor.

—Nikolaus Schareika, Christopher Brown, and Mark Moritz

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