

Confronting region and environment in Mato Grosso: the variation and ambiguity of cattle ranching, 1870-c.1970¹

Robert W. Wilcox*

Abstract

Lately, globally-centered comparative histories have attracted considerable attention in the writing of environmental history. To write such histories, however, it is necessary first to examine the role of regions, their development, and ultimately their global connections. Agricultural history is central to this discussion, including cattle ranching. Domestic animals have been an essential element in modern economic development, and yet erroneously livestock raising often has been seen as one-dimensional, with little difference across regions and the world. By examining variation and ambiguity in southern Mato Grosso ranching the reader will come to better appreciate the complex historical relationship between environment, region and the world

Key words: Regions. Ranching. Environment. Mato Grosso.

The peculiarity of environmental history is that it is general and universal history and at the same time specific and concrete local history.²

Introduction

As reflections of today's ever more integrated and globalized world, comparative and global history have taken their places as important aspects of recent historiography. Whether political, economic, social or environmental history, we hear

* Northern Kentucky University. E-mail: wilcox@nku.edu

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repeated calls for more comparisons on a global scale. In part, this is a natural response to the global concerns of the day and a healthy direction for historical study. Environmental history has been well-served by this movement, as seen in the wide range of works published over the past couple of decades.³ The insights learned from studying apparently disparate regions of the world are invaluable in understanding one's own region or nation, never mind the world as a whole and such perspective deserves to be further encouraged. Yet it is perhaps too obvious to point out that comparative investigation, global or otherwise, cannot succeed without first the regional or local. As no doubt all of the previously-cited historians would agree, global and comparative history requires a form of "microhistory" upon which to construct a dialogue. There are several reasons for this, but first among them is the investigative need to establish specificity of locale before drawing broader comparisons and conclusions. This is particularly the case for environmental history, and it is on this juxtaposition of the global and the regional in Latin American environmental history that I wish to focus here.

An historian who engages this concern directly is Germán Palacio. In his essay, *Historia tropical: a reconsiderar las nociones de espacio, tiempo y ciencia*, Palacio argues that to write the environmental history of Latin America we must be aware of the impact of region and of globalization, today and in the past. To address this, Palacio introduces the concept of *glocalidad* (glocality). He observes that in considering

the environmental concerns of the tropics, outside (largely Eurocentric) perceptions have tended to dominate the conversation. This is illustrated by his view that only two conflicting solutions to ongoing ecological degradation of the tropics have been proposed: the rather mainstream and optimistic view that technology and science will solve all concerns; and an activist approach that calls for total preservation of the tropics in order to protect the ecosystems and native inhabitants of the region, at times even from themselves. While his argument might be somewhat overstated, Palacio's point is that these views are simply continuations of a long-term pejorative conception of the tropics as having a uniform structure, and obscure the rich individual characters of regions and their potential to offer lessons that could be applied globally.⁴ This is something with which most historians of Latin America are familiar. Over the past decades debates over development of the area have incorporated a number of analyses that embrace one or the other perspective, yet often what seems to be missing in broad studies of tropical regions is the specificity of each locale. To some extent this has been addressed in Latin American historiography, which is full of "regional" studies, usually of nations but often of states/provinces or even individual municipalities.⁵

For Latin America, however, such studies largely have been socioeconomic and/or political in scope, with some attention paid to issues of race, gender, and hierarchy. While land and land tenure have frequently been important elements in

regional histories, until recently examinations have not been much concerned with landscape and the human interaction with it. Yet there is a real need for such studies, since a full understanding of regional relationships cannot ignore the environmental stage on which many local interactions are played. Recent environmental histories of Latin America reveal a much more nuanced view of regional relationships than some earlier political or economic treatments, whether examining so-called “encounters”, the role of perceptions among Latin American elites and scientists, or of commodities (bananas, sugar, forests, minerals, etc.), that have dominated Latin America’s economic development.⁶ And while attention has been paid to various commodities (primarily agricultural) and landscape transformation in a number of regions, let me suggest that one largely ignored element of regional agrarian development has been cattle ranching. I believe this activity deserves much more attention because it displays many variations and ambiguities that reveal the complexity of studying region in agricultural and environmental history.

Few studies of cattle in Latin American history have explicitly addressed the role of the environment in ranching expansion.⁷ This is curious because the nature of ranching lends itself to such examination. Indeed, if we observe the development of ranching in the tropics over the past few decades and the attention it has attracted from biologists, geographers, anthropologists, and environmentalists, one would assume this issue must have attracted

more attention from historians.⁸ It is doubly curious that the same can be said of ranching in U.S. historiography, although some recent studies have incorporated a component of the environment, if much more is needed.⁹ The reasons for this lacuna are not clear but I speculate may in part have to do with an overreaction to popular perceptions of ranching as a cultural icon that resists deconstruction, whether in the United States or Brazil.¹⁰ Despite popular myths of the cowboy/vaqueiro/gaúcho, in both nations cattle ranching often is and has been a source of socioeconomic and environmental conflict, whether with and between other agricultural settlers, indigenous peoples, state, forest, or even the soil. Ranchers often have been seen as villains, yet the activity’s importance in the economic and social development of many regions is crucial, and as such deserves more circumspect attention.

To be expected, there are certain elements, especially in the Americas, that are common to ranching, regardless of where it operates. These are the obvious: cattle, grass, water, markets, etc. And while obviously all ranching has its historical roots, what makes the regional connection notable in our argument here is that expertise forged in semi-tropical regions of interior Brazil has taken on major influence in ranching expansion into the rest of the tropics, most prominently the Amazon. Ranching came to semi-tropical Brazil in the late colonial period and expanded from the mid-nineteenth century, over time developing characteristics and technologies that would be applied to tropical regions in the

waning decades of the twentieth century. These were sometimes more “appropriate” to tropical ranching than those learned in temperate zones of the country or more distant cattle regimes in Argentina or the United States, but had their impact none the less. It is my contention that examining this experience reveals how regions take on a much greater importance in determining the whole of environmental history because of what they teach us about their variety of experiences and range of diversity at the ground level.

A ranching region that illustrates this connection is the south of the present Brazilian state of Mato Grosso do Sul.¹¹ The historical experience of southern Mato Grosso up to the 1970s reveals several major inputs and pressures that in part have reappeared in other areas of the country and the world. These involved a range of influences that not only offer insights into the construction of the environmental history of ranching, but I believe into the study of environmental and agricultural history in general. The most important include: economy and local and national politics; land tenure issues; and technological innovations versus traditional practices and their environmental constraints and impacts. Keeping in mind their more recent influence (or not) on tropical ranching, particularly in Amazonia, these will be the focus of the rest of this essay.¹²

A Brief Geographical Overview

Broadly, southern Mato Grosso hosts two distinct, though linked, ecosystems – the Pantanal and the cerrado. The former,

viewed worldwide as a natural paradise, is a lowland floodplain in the western sector of the state bordering on the nations of Bolivia and Paraguay and encompassing over 25 percent of the state. The region experiences relatively predictable annual flooding that defines its environment, in particular rejuvenating native grasses. Wildlife is abundant, especially aquatic and avian, and even with the arrival of Euro Americans impact on most populations was minimal. This has changed in recent years, but during our period of study beef cattle not only survived and coexisted with most other species, but became an integral part of the local ecosystem. In fact, the region was one of the first to host cattle in Mato Grosso. Impact on the environment by sometimes quite large herds of cattle of up to 30,000 head was limited by flooding and wide herd distribution, though where animals were concentrated, such as around ranch buildings, the effects could be severe. Still, observations over time show that cattle were able to integrate into the local ecosystem more readily than in other areas of the country, a situation that has sometimes prompted local ranchers to exaggeratedly claim that ranching has “saved” the Pantanal.¹³

The cerrado is a semi-tropical savanna covering over 50 percent of the state and receives less rainfall than the Pantanal, while made up of soils of comparatively low fertility. The eastern parts of the region are classified as semi-arid, though overall the cerrado experiences relatively regular rainfall and hosts a number of rivers and streams that irrigate a variety

of vegetation, especially grasses and low bushes. As such, it has been attractive for the raising of cattle, though the environmental impact of ranching has been more pronounced than in the Pantanal. The region also hosts a relatively high percentage of invasive grass species, deliberately or inadvertently brought by settlers over the centuries. Today, the ecosystem of the cerrado in Brazil overall is recognized as under similar or perhaps even more serious pressure as the Amazon, but for most of the period discussed here the region hosted significant herds with limited impact. This was so in part because a sub region of the cerrado along the Paraguayan border, the so-called campo limpo, has hosted the bulk of cerrado cattle populations in a region of abundant rainfall, more fertile soils and varied vegetation, thus better able to sustain decades of ranching activity. As such, stocking levels of cattle did not have the same impact as in other parts of the cerrado, though as we will see economic, political, and land issues also helped to limit ecological stress.¹⁴

Economy and the state

Southern Mato Grosso has hosted cattle ranching since the colonial period, but the sector began to show some limited organization from the 1830s. Though primarily subsistence until after the Paraguayan War (1864-70), in the last decades of the nineteenth century ranching expanded and tentatively connected to the national market. However, the main economic activities in the state as a whole between 1870 and 1914 were not from ranching but

erva mate tea (*Ilex paraguayensis*) and rubber (mangabeira and seringueira). The latter was collected in the far northern Amazon, while erva was extracted along the border with Paraguay. Both products generated local elites who had disproportionate influence in state politics. Yet cattle provided considerable income to the state, especially from World War I, and as much as possible southern ranchers participated in local politics, particularly in a series of civil wars and political confrontations between 1896 and the 1930s.¹⁵

For the most part, these conflicts were between different factions of the elite. As was the case throughout rural Brazil of the time, local political and economic leaders (coronéis) struggled with other potentates based on either political favors from state or national governments or power for its own sake, and on the protection of economic interests that supported such authority. For some, land control through ranching became a key component in consolidating local power, regardless of the number of head of cattle in their possession. Yet ranching, despite its growing importance in the regional economy, was primarily based in the south and, with the exception of a large private erva concession, relatively little developmental attention was paid to the region by the political elite in the state capital of Cuiabá. Frustrated by the levy of import and export taxes with little perceived return, some southern coronéis armed themselves to seek direct control of the region's affairs through military means. The military forces fielded in these conflicts were almost

always either “professional” bandits or employees of elite protagonists. Many, of course, were cowboys and other ranch personnel.¹⁶

Most important in this conflictive period was the fact that production from the region depended on markets in Argentina and southeastern Brazil. Erva was sent down the Paraguay and Paraná Rivers to the booming market of Buenos Aires, and matogrossense cattle products found markets in São Paulo (live cattle) or the Río de la Plata (beef jerky and hides). Most settlers came from southern Brazil, a sizeable contingent from Rio Grande do Sul, who brought their expertise in raising cattle into the region. Southern Mato Grosso’s attention was largely directed away from the rest of Mato Grosso, leading to unsuccessful attempts to separate the region from the rest of the state. At one point this occurred due to intervention of the federal government during the 1937-45 Estado Novo of Getúlio Vargas, but definitive statehood was not achieved until 1979, decades after ranching had become the primary money-earner for the state.

These conflicts caused some Cuiabá governments to express support for ranching as a valuable economic activity, but political decisions were usually made based on the perceived need to guarantee some income from the south to the state. Hence investment, land and other concessions, and taxation were more often attempts to generate fiscal income than genuine desires to support ranching development. Large land concessions were granted to foreign enterprises and wealthy investors

from outside the region, taxes were levied on cattle production that sometimes limited incomes, plans were drawn up for development projects that languished on the shelf, etc. Part of the problem was the relative lack of interest by the federal government in Rio de Janeiro, which was far more concerned with income generated by coffee in southeast Brazil. The result was that development in the south was mostly up to residents in the region. Indeed, Cuiabá developmentalist thought that promoted railroads in the state tended to view the capital as a natural terminus for a railway beginning in São Paulo or Rio that linked the far west with coastal Brazil. It was federal geopolitical concerns that finally contributed to the construction of a railway from São Paulo into southern Mato Grosso at the Paraguay River port of Corumbá in 1914, reinforcing the economic direction of southern Mato Grosso.¹⁷

This wedding of politics and economy tended to impact environmental issues related to ranching. While markets dominate the economic development of any activity, often politics determine the degree and speed at which such development occurs. In the case of Mato Grosso, state government tended to ignore ranching development in the south, regardless of occasional political rhetoric. To be sure, some attempts were made to establish experimental ranches or agricultural stations by both state and national governments, but in every case until the 1960s these met with little or no ongoing support, fiscal or otherwise, and quickly languished or disappeared.¹⁸ Responding to limited, if usually steady,

market demands, ranchers were forced to engage in their business without fiscal support, adapting and modifying based on their own experiments or sporadically drawing on expertise from outside the region. As we will see, such expertise was not always appropriate to local ecosystems, and when this was the situation ranchers usually responded by quickly abandoning the advice. In some cases, however, it was instrumental in determining the future direction of matogrossense ranching. But much of this development was haphazard and highly experimental, with relatively limited impact on local ecosystems.

The absence of governmental support is not always a bad thing, particularly in terms of environmental impact, but in the case of Mato Grosso this also meant that there was minimal coordination of operations and uniform application of technology. Without an overarching developmental structure ranching in the region had to respond to its possibilities, governed by irregular market demands and the feasibility of raising cattle in particular ecosystems. The result was the sector grew relatively slowly, though it boomed with World War One, at which time both the state and federal governments paid more attention, though with limited concrete results. But cattle populations grew dramatically over succeeding decades, gradually drawing the region into the national developmental sphere.

This is an important contrast to Amazonia today, for ranching development in that region has experienced intense federal and state government incentives over

the past few decades, responding to real or perceived economic benefits generated through demand in the rest of Brazil or overseas. The environmental impact has been considerable, as has been documented by many.¹⁹ Southern Mato Grosso experienced a similar demand beginning in the 1960s, but it was a region that relied less on government, hence the process developed more slowly and, it can be argued, limited development and hence environmental impact until the 1970s, when the federal government entered the state in the same way as in the Amazon. The issue of land tenure played a key role in the process.

Land tenure

Legal land tenure was poorly developed in the early period of ranching in Mato Grosso. There were sporadic attempts to impose a uniform system of land control with the national land laws of 1850 and 1854, but the isolation of the province during the Imperial period and a lack of interest from Rio de Janeiro meant that regulation was limited. The result was that while some ranch properties evolved out of the colonial sesmaria land awards of 13,000 hectares (though often many were much larger), the majority were simply squatted public land. After the Paraguayan War a more concerted attempt was made to register properties, especially with an increase in migration to the region, though this had little success. As with much of the rest of Brazil, particularly the interior (*sertão*), those properties that were registered tended to be large and belong to powerful individuals or families involved in the local

economy and politics. Registration was irregular, however, and only with the declaration of the republic in 1889 and transfer of jurisdiction over land to the states in 1891 did the stakes rise significantly. Land became a commodity for the state government, and was registered and sold based on favoritism and the need for revenue. As demand for land expanded the potential for abuses and conflict increased proportionately, leading to political rebellion and local violence.²⁰

With the twentieth century and more direct insertion into the national economy, land tenure in Mato Grosso became more institutionalized. State authorities exerted more influence than in the past and, with the intent of encouraging immigration into the lightly-populated state, passed a land law in 1892 that divided up public lands based on perceived economic value. State lands offered for farming were limited to 900 hectares, for *erva mate* and rubber exploitation to 450 hectares, and for ranching to 3.600 hectares.²¹ In many circumstances these dimensions meant nothing, especially if local potentates wished to acquire more land. None the less, the state government's approach through these regulations revealed an understanding of land use and environmental limitations, if not articulating an environmental consciousness. Based on the experience of established ranchers, the basic ranch plot fixed at 3.600 hectares recognized that for a viable pastoral economy the needs of cattle and the carrying capacity of the land had to be taken into consideration. The customary stocking rate of roughly one

animal to 3-6 hectares meant that such a property could ideally carry as many as 1.200 animals, a healthy number for a small rancher.²²

That this did not stimulate a surge in small ranching operations should come as no surprise, since both financial and political circumstances limited the number of small operators. But inadvertently the law did take into consideration regional ecological realities, even if the major impetus was economic viability. There was recognition that land had different ecological "values" in terms of use, and an understanding that the diverse ecosystems in the state required some monitoring of carrying capacity. This was seen in the drier portions of the *cerrado* in the east of the state, where landholdings larger than 3.600 hectares were often exempted from the regulations. The same was true for the lowland *Pantanal* of the west, where annual flooding dictated extensive ranch holdings in order to facilitate seasonal transhumance.

The period after 1900 saw the growth of large ranching operations, including the insertion of foreign investment, with several companies purchasing enormous tracts of land of between 150,000 and 800,000 hectares.²³ The number of cattle pastured on each depended greatly on local environmental and economic conditions, but the average was 30,000 head, a stocking rate of roughly one head to 8 hectares. Of course, many sectors of these holdings were not suitable or used for ranching, thus we can conclude that in parts of these ranches animal concentrations were more intense. Still, ranching in Mato Grosso was pri-

marily extensive and dominated by large ranches, which meant that stocking levels were always much lower than in regions of fattening for slaughter, such as Barretos in São Paulo, regardless of the size of the property.²⁴

Expansion of holding size saw little state oversight until after the fact. These almost always reflected tenure issues based on economy and/or power, not explicit ecological considerations. In fact, it appears that a significant portion of landholding was speculative, not in the economic sense of the term, or at least not until the 1920s, but in regards to political power. Wealth was measured by the number of cattle one possessed, regardless of marketability, power by the size of one's property.²⁵ Of course, to have both was to be in the best position of all, but it was the latter that eventually counted most. Indeed, many ranchers were not even sure of the number of animals they possessed, nor were they particularly concerned about this ignorance. The result was that herds reproduced naturally, and in relative balance with the local ecosystem. One conclusion that can be drawn from this is that while extension of large holdings was certainly "socially unfriendly" in restricting opportunities for smaller operators, they were in a sense, at least temporarily, "environmentally friendly", since the pressure on the land of large holdings with a limited number of animals was much less than could be expected for smaller, more intensively-stocked operations.

This became clearer with time and interest in the region, as land division throu-

gh inheritance and an increasing influx of settlers into Mato Grosso after 1945 led to the contraction of large family operations and smaller ranchers rose in importance. The impact on the environment was greater as a result, particularly around the city of Campo Grande, where some fattening operations were established. As more cattle were stocked on smaller properties the value of the land increased, leading to even greater incentive for investment. Unlike in the past, the need for a more direct response to a ranch's specific ecology slowly became apparent, although the process was a slow one and not widely considered until the 1970s.²⁶

The experience of land tenure in Mato Grosso indicates not only how one state may have different ecological conditions from another, but that even within the state there are regional conditions that must be taken into consideration for a viable economic and ecological balance. This was not the case for Amazonian cattle ranching from the 1970s due to an imposition of tenure onto the region determined in the political capitals of states and the nation. Governmental incentives, subsidies and tax breaks encouraged the razing of forests for the pasturing of cattle based on criteria totally exogenous to the region(s). In Mato Grosso up to the 1970s this situation did not occur, in part because the state government and individual ranchers had the experience of long decades of ranching determined more by local conditions than outside influence. Indeed, an argument can be made that until the 1970s ranching practiced in Mato Grosso

was relatively benign in its environmental impact, regardless of a perceived need for further “development.” This was certainly due more to limited market returns for Mato Grosso ranchers than any innate sense of a sustainable future, but the result was the same, and only with the direct entry of the national government did this intensify, leading to the overstocking of many Mato Grosso pastures, with predictable ecological deterioration. Part of this process, though, had to contend with specific experiences in the irregular application of ranching technologies during the earlier period.

Tradition, technology and the environment

As indicated, cattle in Mato Grosso have been raised in varied ecosystems. The environment in each region requires a specific understanding of local climate, soil, and forage conditions that cannot be applied easily, if at all, to other sectors of the state, never mind the rest of the country. Local ranchers have known this for generations, and their knowledge has governed the types of ranching practices chosen.

In the cerrado, natural conditions have tended to restrict the number of cattle that can be grazed on the land. Depending on access to water this could range anywhere between one head to 3 hectares and 1:7 hectares or more. While experimentation taught local ranchers how many head could be supported, for economic reasons some attempted to graze more than

the land could carry, rapidly exhausting their pastures. This was especially the case for those who practiced unrestricted pasture burning. However, most of these ranchers failed, leaving the rest to engage in extensive ranching that could at least support a subsistence economy of cattle raising. As in all extensive regimes, animals roamed “free”, and were frequently semi-feral. Before the twentieth century, property boundaries were not rigidly determined, primarily because local ranchers relied upon each other to round up, separate, brand and castrate animals. This occurred due to the lack of definitive tenure as well as the costs of separation (fencing). Ranchers benefitted by cooperation with neighbors, while the social structure was maintained through intermarriage. This was a relatively endogamous society that tended to act in collaboration and often resisted change from the outside.²⁷ The same was true of the Pantanal, where uncommon climate conditions dictated the time and type of ranching possible. Here, regular annual flooding precluded most use of fencing except around ranch buildings, and local ranchers united to care for and market their animals, especially during the floods, which required moving animals to higher ground, a form of transhumance. As in much of the cerrado, pantaneiro society tended to intermarry and change came slowly.²⁸

In both cases ranching was largely subsistence, with outside demand primarily for hides or beef jerky from the Pantanal and live cattle from the cerrado. Cattle breeds were descendents of Iberian animals

acclimatized to Brazilian conditions, in the case of the Pantanal specific adaptations to annual flooding. Most were small animals, with little meat and sometimes scruffy hides, products that generated little enthusiasm in the market. However, over time animals imported from neighboring states, particularly Minas Gerais, helped to “improve” the breeds by producing larger, more corpulent steers. This meant that cattle raising in the cerrado became more connected to sources of breeder animals and markets to the east, above all the states of Minas Gerais and São Paulo. For the Pantanal, most animals were sold to the jerky and hide markets, which processed the animals in Mato Grosso and sent the lean dried meat and hides down the Paraguay River to the Río de la Plata and eventual markets in urban Brazil and Cuba. As a result, breed “improvements” came much slower here than in the cerrado.²⁹

This situation began to change in the first decade of the twentieth century, and particularly as a result of World War One. Since the late nineteenth century some ranchers in neighboring Minas Gerais had been experimenting with breeding zebu cattle from India. Their experience clearly revealed that these cattle were much better suited to the tropical conditions of Brazil as they grew and flourished at much higher rates than local Iberian descendents and the northern European breeds dominant in Rio Grande do Sul and Argentina. This experience was soon transmitted to Mato Grosso, shifting ranching priorities for ranchers who had the means to acquire the animals.

I have told this story elsewhere in greater detail, but for our purposes it is important to emphasize how much the role of technology impacts the form of ranching.³⁰ In this case, the breed of animal had a tremendous impact on transforming cattle raising in Mato Grosso, to the extent that today zebu dominates in the region. In fact, zebu dominates in ranching throughout the tropical Americas and often the first breeder stock came from Brazil. This meant that with a better performing animal for the first time there was real potential for substantial income.

Zebu are naturally adapted to the tropics and breeding programs in Brazil have developed animals that are excellent meat producers, a purpose that has not been a priority in the breed’s native India. The largely white-haired animals, with dark skin pigmentation and an ability to resist flies, ticks, and parasites, were ideal for Brazil and spread to several regions, including Mato Grosso. At the same time, zebu flesh is largely separate from its fat, hence the animal produces a leaner meat. Historically, the latter condition was a negative for the market, although time and altered demand have increased the breed’s value in that department. This was generally recognized by many ranchers in the state, especially those near Campo Grande and closest to the live cattle markets of São Paulo. In other areas, however, the introduction of this new breed was resisted.³¹

This was particularly the case in the Pantanal, where most production until the 1940s went to the jerky factories along the Paraguay and other local rivers. An argu-

ment made at the time was that the meat of matogrossense cattle was quite lean, hence did not spoil as easily as the meat of other breeds. At the time, zebu were not seen as much different from the European breeds raised in other parts of the country, primarily Rio Grande do Sul. Another argument had to do with “tradition” and perception of innovation. As rancher Renato Ribeiro explained, his father resisted the introduction of zebu because as a man of business he read the most recent newspapers and zootechnical publications from São Paulo which, during the 1930s and 1940s, disparaged zebu in favor of the São Paulo breed of caracú. While Ribeiro Sr. had no caracú on his ranch, he believed the claims of the paulistas over those of mineiros and against a gradual trend to breed more zebu into Pantanal herds, and he resisted this process until zebu’s value became obvious in the 1950s.³²

This is a local example of how “tradition” held out over “innovation”, perhaps wrapped in an unconscious veneer of “civilization” *versus* “barbarism”.³³ What these examples of resistance to such introduction indicate, however, is that regional value judgments in the guise of “science” can also have a significant impact on the adoption of technology. At the same time, producers are subject to market conditions, whether local or national, and technological decisions often are made based more on such criteria than on “scientific expertise”. Indeed, it can be argued that this resistance was more “rational” than external demands for change in the matogrossense ranching industry because it represented a more re-

alistic view of the viability of regional ranching and its dependence on market and financial options.³⁴ While “modernization” through the adoption of zebu did eventually come to dominate in the regional industry, that such a process does not necessarily follow a “natural” or linear process of change offers an instructive lesson for the writing of the history of cattle ranching and of the environment in general.

Zebu ultimately did triumph throughout the state, however, as the breed’s proven adaptation to the American tropics guaranteed its adoption by the 1950s and 1960s. Today, this and the lean meat it produces are strong arguments for the production of zebu in Brazil and elsewhere. At the same time, zebu have been raised in many parts of Brazil in semi-extensive ranching and fed almost exclusively on grass, an attractive alternative to grain fed beef raised in environmentally unfriendly feedlots. But the benefit of raising zebu also brought other elements into the equation.

Such inputs included the introduction of barbed wire fencing, planted pasture, and the provision of a more varied diet for cattle, particularly through vitamin and mineral supplements. And these inputs changed the structure of Mato Grosso ranching. The introduction of wire fencing had been slow largely because of the extensive nature of ranching and the cost involved. Barbed wire, though invented in the 1870s and used sparingly in Mato Grosso, was not produced in Brazil until the 1950s, and initially only in small quantities. Hence the cost was prohibitive, even to those ranchers in the region who

had a desire to fence their properties. The market did not yet encourage such expenditure and since most cattlemen relied on extensive ranching, there was little incentive to import wire. This began to change with the arrival of zebu in large numbers, which felicitously occurred just as World War I broke out. The ensuing market for Brazilian beef, regardless of “quality,” encouraged the extension of zebu breeding and the stringing of fences in various parts of Mato Grosso. The environmental impact, however, was not truly felt until costs were sufficiently low to warrant replacement of wood fences, a situation that only occurred beginning in the 1950s and 1960s.³⁵

But fencing was only one aspect of the arrival of zebu into the region. The introduction of another type of exotic also occurred – planted grasses. As has been revealed in other works, many of the grasses that ranching has relied upon in Brazil and other countries of the tropical Americas came from Africa during the colonial period.³⁶ Some had been so long a part of the scene in Brazil that most people assumed they were native to the country. In Mato Grosso, however, cattle relied primarily on native species, although some exotics were beginning to appear spontaneously by the early 1900s. It was not until the arrival of zebu, however, that most of these grasses entered the region, through deliberate introduction by ranchers intent upon “improving” their businesses. A variety of species were planted, some more successful than others depending on local ecological conditions. And an unforeseen result of these deliberate introductions,

mirroring their introduction into Brazil in the first place, was the uncontrolled spread of several exotic species throughout the region. Once established, they were in the region to stay.³⁷

The Pantanal, however, saw fewer deliberate or spontaneous introductions due to the region’s unique ecosystem of annual flooding. Here, exotics were less adapted to long periods under water than native species, and so far only in the more elevated areas of the region bordering the cerrado have introductions been successful. In the cerrado, however, the impact was easily apparent. Several species of native grasses and legumes were choked out by competition from these “invaders”, with many becoming rare as early as the 1940s. Some have been eliminated altogether. At the same time as ranchers expanded their planted pasture over the decades the type of ranching changed. Now the element of “rationality” versus the “inefficiency” of traditional practices entered the picture in force. Modern ranching practices dictated “improving” the ranch by breeding, planting, and fencing, and matogrossense ranchers who could afford to followed the new rules to the letter. The result was that lands were stripped of forest and other “undesireable” vegetation where possible, the number of cattle placed on the pasture was increased significantly, and considerable erosion occurred in some areas. Still, most ranchers relied on extensive ranching into the 1960s, and the environmental impact was largely local, mostly around cattle centers like Campo Grande and Três Lagoas, a situation that did not yet generate

concern about the ecological degradation caused by these new practices.³⁸

One element of the introduction of artificial grasses that deserves mention was the practice of pasture burning to rejuvenate grasses. The custom was common throughout the history of ranching in Mato Grosso, and had important impact depending on the area and time. The Pantanal saw much less annual burning due to regular flooding and a larger number of humid forests, but even there it was practiced in the higher, drier sectors and during years of low rainfall. In the cerrado it was more common, from as early as the mid-nineteenth century, and impact more intense. The practice still goes on today throughout much of Brazil, with largely harmful results. In the history of ranching in Mato Grosso, the long-term effects were apparent and recognized by contemporary observers, yet the amount of land involved depended on how and where fire was applied. Because much of the region's ranching was extensive, burning often was determined by the number of head on one's land and the size of the property; the fewer or more dispersed the animals and/or the smaller the property, the more restricted the setting of fires. At the same time burning was carried out seasonally and in cooperation, which meant that it was monitored by local ranchers (though not the government). The ecological impact could be severe, especially in drier years, but on the whole evidence suggests the effects of annual fires were limited by the number of properties involved. And compared with more intensive ranching in recent years,

the resulting degradation was restricted to some specific locales and not experienced throughout the state.³⁹

A final element in this argument is the "modern" practice of supplying dietary supplements to cattle. In Mato Grosso, this did not include feedlotting until the very late twentieth century, but did allow for animals to be pastured in more intensive conditions than the past. Salt licks were placed where cattle could be easily controlled for parasites, branding, separation, etc. Artesian wells were dug to help in the concentration of animals, causing a direct impact on the land through compacting and eventual erosion. In all, these and the other measures changed ranching in Mato Grosso, and not least the meaning of "extensive ranching". Even today, the land to cattle ratio in the state is relatively low, one head to 2 to 3 hectares, depending on the particular sub region. Still, the ratio has increased over time, and even more importantly the use of the land has shifted from low interference to a relatively high degree of manipulation. The environmental consequences for various ecosystems in the state have been mixed, but overall the result has been predictable – ecological deterioration.⁴⁰

In Mato Grosso, the practice of "traditional" extensive ranching was transformed gradually by technological innovations that contributed to the expansion of the ranching industry and permitted considerable growth in the region's economic development. This experience was not uniform, however, as residents of various ecological sub regions within the state adopted these

measures late, or in some cases hardly at all. The most obvious example is the Pantanal, where zebu now pasture almost exclusively, occasionally on exotic pastures. But this is an area where adaptation to the elements still determines success or failure. The annual floods hinder the adoption of several innovations that work well only a few tens of miles away in the cerrado. Indeed, in one example the indiscriminate introduction of fencing led to calamity during the disastrous 1974 flood, when over 300,000 animals perished as fences constructed during an extended period of low annual flooding prohibited cattle from reaching high ground and ranchers were unable to save them in time. Since then, measures based on experience have been taken to allow for removal of animals during times of excessive inundation.⁴¹

A central lesson of these experiences for the expansion of ranching in other regions of the Americas and for environmental history in general is that the meeting of tradition and technology is a complex process and “victory” for the latter is not always predestined, complete, or desirable. Without question the imposition of “modernization” through technology has been an integral part of the world’s history, most notably over the last 100 to 200 years, and is not likely to diminish. Yet a better understanding of the role of region in this dialectic of development versus tradition is essential if we are to understand the process in the past and plan for the future, above all a sustainable future. This is apparent as one observes the ecological deterioration of much of Amazonia. Here,

a more sophisticated appreciation of local ecosystems might have helped to restrict the destruction that is so much a part of the region’s recent experience.

Conclusion

There is, of course, much more that can be said about these issues than is possible in this essay. Still, Mato Grosso’s experience in the perception of region is instructive for understanding the role of ranching in environmental history. Until the 1960s ranching in southern Mato Grosso was and was not attached to the international economic structure of capitalism. It was, because Brazil as a nation was connected directly to global capitalism, and cattle production in Mato Grosso did respond to market demands, if on a limited scale. It was not, because much of the structure of ranching in the region was determined by local constraints, political, economic, and environmental. This meant that while cattle raising may have been a business, distinctly “unbusinesslike” structures often intruded to determine the direction of the industry at any particular time.

The historical experience of southern Mato Grosso’s ranching sector owes much to what might be called the “innovation of tradition”. In this I mean that the regional or local plays a preponderantly important role in determining the direction of an activity and its impact on the environment. The tradition that “innovated” in the region included adaptations to local ecological conditions that permitted relatively sus-

tainable operations over a lengthy period of time. Local political and social relations determined the long-term domination of extensive cattle operations in which wealth and power were based on the seeming contradictions of the perceived number of cattle and the extent of landholding, while externally-devised technology (innovation) more often than not was selectively modified to fit into the local political/economic/environmental structure. Naturally this could not last forever, and introduced technology like zebu or African-origin grasses came to dominate in the region. The result was that land use became more intensive and ultimately destructive of the environment. At the same time, the experiences of these introductions in Mato Grosso and other areas of the Brazilian Center West were transmitted to other parts of the tropical Americas, especially the Amazon Basin, with largely negative impact.

Despite this apparent “inevitability,” it is clear that Mato Grosso’s historical experience helps us understand the contribution of region in the study of environmental history, not just for the sake of the region itself but for the lessons it can teach far beyond. Dan Flores has noticed a new direction in environmental history of the U.S. West that he calls regional, bioregional or place history.⁴² Flores argues that some of the best history written about the West in recent years has been place specific, dealing with regions that may or may not represent well-known aspects of western history, but provide valuable illustrations of issues important to westerners. He concludes with a call for historians of

the West to spend more time listening to regions (that is, to the people and animals who live in regions). This is good advice for any study of history, and it also raises a point which can be applied much more broadly. In keeping with Germán Palacio’s concept of glocality, the often ambiguous experiences of ranching in Mato Grosso offer both local and global lessons and illustrate their inseparability. As James O’Connor suggests, environmental history is about region and its variations, everywhere.

Confrontando região e meio ambiente no Mato Grosso: variações e ambiguidades nas fazendas de criação de gado, 1870-1970

Resumo

Tardamente a história comparada, globalmente centrada, tem atraído considerável atenção nos textos de história ambiental. Para escrever tais histórias, porém, é necessário, em primeiro, lugar examinar o papel das regiões, seu desenvolvimento e, por fim, suas conexões globais. A história da agricultura é central para esta discussão, incluindo a pecuária. Animais domésticos têm sido um elemento essencial no desenvolvimento econômico moderno, ainda que erroneamente o aumento do gado tenha sido visto frequentemente como unidimensional, com pouca diferença nas regiões e do mundo. Examinando

as ambiguidades e variações na pecuária do Mato Grosso do Sul, o texto aprecia a complexa relação histórica entre meio ambiente, região e o mundo.

Palavras-chave: Região. Pecuária. Meio ambiente. Mato Grosso.

End notes

- ² O'CONNOR, James. What is environmental history? Why environmental history? *Capitalism, Nature, Socialism*, v. 8, n. 2, p. 3-29, June 1997.
- ³ Some of the most notable in English include, CROSBY, Alfred W. *Ecological imperialism: the biological expansion of Europe, 900-1900*. New York: Cambridge University Press, 1988; GROVE, Richard H. *Green imperialism: colonial expansion, tropical Island Edens and the origins of environmentalism, 1600-1860*. New York: Cambridge University Press, 1995; McNEILL, J. R. *Something new under the Sun: an environmental history of the Twentieth-Century World*. New York: W. W. Norton & Company, 2000; HUGHES, J. Donald. *An environmental history of the world: humankind's changing role in the community of life*. London and New York: Routledge, 2001; RADKAU, Joachim. *Nature and power: a global history of the environment*. Translated by Thomas Dunlap. German Historical Institute. Washington, D.C. New York: Cambridge University Press, 2008; BURKE, Edmund; POMERANZ, Kenneth (Ed.). *The environment and world history*. Berkeley: University of California Press, 2009.
- ⁴ PALACIO, Germán. Historia tropical: a reconsiderar las nociones de espacio, tiempo y ciência. In: PALACIO, Germán; ULLOA, Astrid (Ed.). *Repensando la naturaleza: encuentros y desencuentros disciplinarios en torno a lo ambiental*. Leticia: Universidad Nacional de Colombia, Imani, 2002. p. 94-97. It seems to me that it is impossible to even construct global histories without understanding the unique character of regions.
- ⁵ What is meant by "region"? For our purposes here, and recognizing that these definitions are tenuous at best, I perceive a region to be a politically-constructed geographical space such as a state or department, but with specific characteristics that make it distinct from
- other "regions", whether in terms of geography, culture, climate, economy, or history. This does not preclude regions within regions, of course, or the presence of various ecosystems, a condition that introduces considerable complexity into the definition, but which is essential to our discussion. Indeed, it is my contention that to engage the concept of region is to confront constant variation and ambiguity, which complicate yet enrich the study of history. For a recent study of the role of region in the historiography of the U. S., see the book of essays by AYERS, Edward L.; LIMERICK, Patricia Nelson; NISSENBAUM, Stephen; ONUF, Peter S. *All Over the Map: Rethinking American Regions*. Baltimore: Johns Hopkins University Press, 1996.
- ⁶ A valuable beginning to understanding the development of Latin American environmental history should be SEDREZ, Lise. Latin American environmental history: a shifting old/new field. In: BURKE, Edmund; POMERANZ, Kenneth (Ed.). *The environment and world history*. Berkeley: University of California Press, 2009. p. 255-275; CAREY, Mark. Latin American environmental history: current trends, interdisciplinary insights, and future directions. *Environmental History*, v. 14, n. 2, p. 221-252, April 2009. Sedrez presents a cross-section of recent work in Spanish and Portuguese as well as English, while Carey does the same but in the process offers a challenge to environmental historians of Latin America to consult with other disciplines and chart new paths and themes. Though this is changing, to date environmental histories of Latin America are dominated by English-language studies. For example, CROSBY'S, Alfred. *The Columbian exchange: biological and cultural consequences of 1492*. Westport, CT: Greenwood Press, 1973, is a classic study of the environmental side of the encounter, followed later by MELVILLE'S, Elinor. *A plague of sheep: environmental consequences of the conquest of Mexico*. Cambridge: Cambridge University Press, 1994; DEAN, Warren. *With broadax and firebrand: the destruction of the Brazilian Atlantic Forest*. Berkeley: University of California Press, 1995. All of these have been translated into either Spanish or Portuguese. There are, of course, some excellent general studies in Spanish and Portuguese. Among the most notable are HERRERA, Guillermo Castro. *Los trabajos de ajuste y combate: naturaleza y sociedad en la historia de América Latina*. Habana: Casa de las Amé-

ricas, 1995; MARTÍNEZ, Bernardo García; JÁCOME, Alba González. *Estudios sobre história y ambiente en America I: Argentina, Bolivia, Mexico, Paraguay*. Mexico City: Instituto Panamericano de Geografía e Historia/El Colegio de México, 1999; MARTÍNEZ, García; JÁCOME, González. *Estudios sobre história y ambiente en America II: Norteamérica, Sudamérica y el Pacífico*. Mexico City: Instituto Panamericano de Geografía e Historia/El Colegio de México, 2002. Only short general studies have been published in Portuguese so far DUARTE, Regina Horta. *História e natureza*. Belo Horizonte: Autêntica, 2005; MARTINEZ, Paulo Henrique. *História ambiental no Brasil: pesquisa e ensino*. São Paulo: Cortez, 2006; MARTINS, Marcos Lobato. *História e meio ambiente*. São Paulo: Annablume, 2007. A fine study in Portuguese of the Amazon from an environmental perspective is LEONARDI, Victor. *Os historiadores e os rios: natureza e ruína na amazônia brasileira*. Brasília: Paralelo 15, 1999; while Ricardo Ferreira Ribeiro has studied the sertão of Minas Gerais extensively in *Florestas anãs do sertão: o cerrado na história de Minas Gerais* (Belo Horizonte: Autêntica, 2005) and *Sertão, lugar desertado: o cerrado na cultura de Minas Gerais* (Belo Horizonte: Autêntica, 2006). Two outstanding recent studies of perceptions in Latin America in English include, EVANS, Sterling. *The green republic: a conservation history of Costa Rica*. Austin: University of Texas Press, 1999; McCOOK, Stuart. *States of nature: science, agriculture, and environment in the Spanish Caribbean, 1760-1940*. Austin: University of Texas Press, 2002. On the same theme in Portuguese, see the outstanding work by PADUA, José Augusto. *Um sopro de destruição: pensamento político e crítica ambiental no Brasil escravista (1786-1888)*. 2. ed. Rio de Janeiro: Jorge Zahar, 2004. For commodities, a number of important studies include SMITH, Mark. *The political economy of sugar production and the environment of Eastern Cuba, 1898-1923*. *Environmental History Review*, v. 19, n. 5, p. 31-48, Winter 1995; DEAN, With Broadax and Firebrand; MILLER, Shawn William. *Fruitless trees: Portuguese conservation and Brazil's Colonial Timber*. Stanford, Calif.: Stanford University Press, 2000; TUCKER, Richard P. *Insatiable appetite: the United States and the ecological degradation of the tropical world*. Berkeley: University of California Press, 2000; MARQUARDT, Steve. *Green havoc: Panama*

disease and labor process. *American Historical Review*, v. 106, p. 49-80, 2001; SOLURI, John. *Banana cultures: agriculture, consumption, and environmental change in Honduras and the United States*. Austin: University of Texas Press, 2005; MONZOTE, Reinaldo Funes. *De bosque a sabana: azúcar, deforestación y medio ambiente en Cuba, 1492-1926*. Mexico City: Siglo XXI Editores, 2004. This was recently published in English as *From rainforest to cane field in Cuba: an environmental history since 1492*. Chapel Hill, NC: University of North Carolina, 2008.

⁷ Recent exceptions include Andrew SLUYTER, S. *The Ecological Origins and Consequences of Cattle Ranching in Sixteenth-Century New Spain*. *Geographical Review*, v. 86, n. 2, p. 161-177, 1996; SLUYTER, From Archive to Map to Pastoral Landscape: A Spatial Perspective on the Livestock Ecology of Sixteenth-Century New Spain. *Environmental History*, v. 3, p. 508-528, 1998; HERNÁNDEZ, Lucina (Comp.). *Historia ambiental de la ganadería en México*. Veracruz: Instituto de Ecología, 2001; AUSDAL, Shawn Van. *Pasture, profit, and power: an environmental history of cattle ranching in Colombia, 1850-1950*. Geoforum, online for a price at: <http://www.sciencedirect.com/doi:10.1016/j.geoforum.2008.09.012>, and Stephen Bell's excellent study of ranching in Rio Grande do Sul: *Campanha Gaúcha: A Brazilian Ranching System, 1850-1920*. Stanford: Stanford University Press, 1998. Besides introducing a significant component of environment into his work, Bell follows a deep tradition in gaúcho history, in which ranching has become the definer of state identity, though not without some recent criticism. See also the late PESAVENTO, Sandra Jatahy. *República velha gaúcha: charqueadas, frigoríficos, criadores*. Porto Alegre: Movimento; Instituto Estadual do Livro, 1980. Rio Grande do Sul is the only temperate ranching zone in Brazil, and today is no longer as important in national ranching as it was during the period of which Bell writes. The dominant region in cattle production today is the tropical and semi-tropical Center West, most specifically the states of Mato Grosso and Mato Grosso do Sul, which host the largest beef populations in the nation, over 20 million head each.

⁸ Among many, some studies are SHANE, Douglas R. *Hoofprints on the forest: cattle ranching and the destruction of Latin America's Tropical Forests*. Philadelphia: Institute for the Study

- of Human Issues, 1986; SCHMINK, Marianne; WOOD, Charles H. *Contested frontiers in Amazonia*. New York: Columbia University Press, 1992; HECHT, Susanna B. The logic of livestock and deforestation in Amazonia. *BioScience*, v. 43, n. 10, p. 687-695, 1993; DOWNING, T. E. et al. (Ed.). *Development or destruction: the conversion of tropical forest to pasture in Latin America*. Boulder, Colo.: Westview Press, 1992; FAMINOW, Merle D. *Cattle, deforestation and development in the Amazon: an economic, agronomic and environmental perspective*. New York: CAB International, 1998; FEARNSIDE, Philip M. Can pasture intensification discourage deforestation in the Amazon and Pantanal Regions of Brazil? In: WOOD, Charles H.; PORRO, Roberto (Ed.). *Deforestation and land use in the Amazon*. Gainesville, FL: University Press of Florida, 2002; MARGULIS, Sergio. *Causes of deforestation of the Brazilian Amazon*. Washington, DC: World Bank, 2003; STANFIELD, Henning et al. *The livestock, environment and development initiative*. Livestock's long shadow: environmental issues and options. Rome: Food and Agriculture Organization, 2006.
- ⁹ A small but representative sample includes WORSTER, Donald. Cowboy ecology. In: WORSTER, Donald. *Under Western Skies: nature and history in the American West*. New York: Oxford University Press, 1992. p. 34-52; STARRS, Paul F. *Let the cowboy ride: cattle ranching in the American West*. Baltimore: Johns Hopkins, 1998; IGLER, David. *Industrial cowboys: Miller & Lux and the transformation of the Far West, 1850-1920*. Berkeley: University of California Press, 2001.
- ¹⁰ This is seen in the invocation of ranching as an integral part of the pioneer ethos ("tamer," or *desbravador* Port.) in the frontier myths that both the U.S. and Brazilian official cultures have cultivated. See AMADO, Janaina. The frontier in comparative perspective: the United States and Brazil. In: AMADO, Janaina (Org.). *Frontier in comparative perspectives: the United States and Brazil*. Latin American Program Working Paper 188. Washington: Woodrow Wilson Center, 1990. p. 28-55. A specific manifestation of this sort of iconology is the rodeo. While Brazil has always had its regional and national rodeos, the fact that Brazilian rodeo cowboys compete successfully today in the most prestigious U.S. rodeos, often broadcast nationally and internationally on television and the internet (<http://www.pro-rodeolive.com/>), indicates the shared character and increasing convergence of cowboy culture of both nations. Indeed, it's not a matter of resisting deconstruction at all, because the activity is flourishing, as witness Brazil hosting the World Cup of Profession Bull Riding in Barretos, São Paulo in August, 2009: <http://www.pbrnow.com/competition/bfts/eventLoad.cfm?id=09-127>.
- ¹¹ Historically, ranching was practiced in the southern part of the state of Mato Grosso, today Mato Grosso do Sul. From this point on I will refer to the state only as Mato Grosso.
- ¹² One important aspect of the expansion of ranching in Latin America that has received little attention in the historical literature is the role of native peoples. There have been some studies on other parts of the Americas, but they have been largely anthropological, and while I fully recognize the need for more historical analysis in relation to Mato Grosso, for the sake of brevity native peoples' participation will not be discussed here.
- ¹³ WILCOX, Robert. Cattle and Environment in the Pantanal of Mato Grosso, Brazil, 1870-1970. *Agricultural History*, v. 66, p. 232-240, Spring 1992.
- ¹⁴ WILCOX, Robert W. The Law of the Least Effort": Cattle Ranching and the Environment in the Savanna of Mato Grosso, Brazil, 1900-1980. *Environmental History*, v. 4, #3, p. 340-342, July 1999; WILCOX, Robert W. Cattle Ranching on the Brazilian Frontier: Tradition and Innovation in Mato Grosso, 1870-1940. Ph.D. Dissertation (Ann Arbor, MI: UMI Dissertation Information Service, 1992), p. 66-73. Campo limpo has also been known as the *Vacaria*, reflecting its ranching history.
- ¹⁵ For discussion of these issues see, LEAL, Joaquim Ponce. *O conflito campo-cidade no Brasil (Os homens e as armas)*. 2nd ed. Rio de Janeiro: Itatiaia Limitada, 1988; CORRÊA, Lúcia Salsa. *História e fronteira: o sul de Mato Grosso, 1870-1920*. Campo Grande, MS: Editora UCDB, 1999; NEVES, Maria Manuela Renha de Novis. *Leões e raposas na política de Mato Grosso*. Rio de Janeiro: Mariela Editora, 2001; CORRÊA, Valmir Batista. *Fronteira oeste*. 2. ed. Campo Grande: Editora UFMS, 2005; CORRÊA, Valmir Batista. *Coronéis e bandidos em Mato Grosso, 1889-1943*. 2. ed. Campo Grande, MS: Editora UFMS, 2006. On the economy during this period, see BORGES, Fernando Tadeu de Miranda. *Do extrativismo à pecuária:*

- algumas observações sobre a história econômica de Mato Grosso - 1870 a 1930. São Paulo: Scortecci, 2001.
- ¹⁶ A particularly egregious case was that of Joaquim Malheiros, who claimed one of the largest ranches in the south, over 500,000 hectares, some of which was part of the Kadiwéu native Indian reserve, of whom he was the appointed director until the late 1890s. Malheiros was deeply active in separatist movements that periodically forced him into exile in neighboring Paraguay and which eventually ruined him. For more, see WILCOX, Cattle Ranching on the Brazilian Frontier, p. 468-472; CORRÊA, Lúcia Salsa. *História e fronteira: o sul de Mato Grosso, 1870-1920*. Campo Grande: UCDB, 1999. p. 175-177.
- ¹⁷ Yet, even when the southern route was completed the federal government did little to reinforce the connection, as most of the rolling stock was directed to the export of coffee from the state of São Paulo, not to carry southern Mato Grosso cattle and cattle products. See QUEIROZ, Paulo Roberto Cimo. *Uma ferrovia entre dois mundos: a E. F. noroeste do Brasil na primeira metade do século 20*. Bauru, SP: Edusc, 2004; *As curvas do trem e os meandros do poder: o nascimento da estrada de ferro noroeste do Brasil (1904-1908)*. Campo Grande, MS: Editora UFMS, 1997. On the futile dreams of Cuiabá for a terminus, see BORGES, Fernando Tadeu de Miranda. *Esperando o trem: sonhos e esperanças de Cuiabá*. São Paulo: Scortecci, 2005.
- ¹⁸ See WILCOX, Cattle Ranching on the Brazilian Frontier, p. 313-318.
- ¹⁹ In English, see HECHT, Susanna B. Cattle Ranching in Amazonia: political and ecological considerations. In: SCHMINK, Marianne; WOOD, Charles H. (Ed.). *Frontier expansion in Amazonia*. Gainesville: University of Florida Press, 1984. p. 366-398; HEMMING, John (Ed.). *Changes in the Amazon Basin*. Manchester: Manchester University Press, 1985; BRANFORD, Sue; GLOCK, Oriol. *The last frontier: fighting over land in the Amazon*. London: Zed Books, 1985; SHANE, Hoofprints on the Forest; H., Charles. Wood and Roberto Porro (Ed.). *Deforestation and land use in the Amazon*. Gainesville: University of Florida Press, 2002; LONDON, Mark; KELLY, Brian. *The Amazon in the age of globalization*. New York: Random House, 2007. To date, there are few books in Portuguese on ranching's environmental impact in the Amazon, a lacuna that sorely needs filling. One exception is FABIANO, Toni. *Expansão e trajetórias da pecuária na Amazônia: Acre, Brasil*. Brasília, DF: Editora UnB, 2007.
- ²⁰ CORRÊA FILHO, Virgílio Alves. Terras devolutas; evolução do processo de adquiri-las em Mato Grosso. *Revista do Instituto Histórico de Mato-Grosso*, v. 3, p. 65-72, 1921.
- ²¹ CORRÊA FILHO, Terras devolutas, p. 70-72.
- ²² ENDLICH, Rodolfo. A criação do gado vaccum nas partes interiores da America do Sul. *Boletim da Agricultura*, v. 4, n. 2, p. 82-83, 1903; LISBOA, Miguel Arrojado Ribeiro. *Oeste de S. Paulo, sul de Mato-Grosso; geologia, indústria mineral, clima, vegetação, solo agrícola, indústria pastoril*. Rio de Janeiro: Typografia do "Jornal do Commercio", 1909. p. 141-145; NASH, Roy. *The conquest of Brazil*. New York: AMS Press, 1926. p. 255.
- ²³ At its height in the early 1920s, the Percival Farquhar consortium of Brazil, Land and Cattle Company held over 2.5 million hectares in various regions of the state. See WILCOX, Robert W. Ranching modernization in tropical Brazil: foreign investment and environment in Mato Grosso, 1900-1950. *Agricultural History*, v. 82, n. 3, p. 366-392 Summer 2008.
- ²⁴ In his seminal essay on ranching in the Americas Arnold Strickon called extensive ranching a "livestock plantation". He based this assessment on the fact that the only product raised on the extensive ranch was cattle, compared to the need of smaller ranches to diversify into crops for feed. He was thinking primarily of Argentina, and while livestock historians of that country can question the extent to which his view applies there, in the case of Mato Grosso it is true that essentially the only product of extensive ranches has been cattle. However, since the region's cattle production was only uncertainly inserted into the market economy some caution must be used in applying such a value-laden term to our examples. See STRICKON, Arnold. The Euro-American Ranching Complex. In: LEEDS, Anthony; VAYDA, Andrew P. (Ed.). *Man, Culture, and animals: the role of animals in human ecological adjustments*. Washington, D.C.: American Association for the Advancement of Science, 1965. p. 231.
- ²⁵ Lisboa, *Oeste de São Paulo*, p. 141-142.
- ²⁶ WILCOX, "The Law of the Least Effort", p. 355.
- ²⁷ For example, a classic of Brazilian literature, *Inocência*, by Alfredo d'Escragolle Taunay,

- was set in the eastern cerrado region of southern Mato Grosso.
- ²⁸ For a fascinating study of ranching culture of the Pantanal see LEITE, Eudes Fernando. *Marchas na história: comitivas e peões-boiadeiros no Pantanal*. Brasília: Ministério da Integração Nacional; Campo Grande: Ed. UFMS, 2003.
- ²⁹ For more, see WILCOX, Cattle and Environment in the Pantanal, p. 244-265; “The Law of the Least Effort”, p. 338-368.
- ³⁰ See WILCOX, Robert W. Zebu’s Elbows: Cattle Breeding and the Environment in Central Brazil, 1890-1960. In: BRANNSTROM, Christian; GALLINI, Stefania (Ed.). *Territories, commodities and knowledges: Latin American environmental history in the nineteenth and twentieth centuries*. London: Institute of Latin American Studies, 2004. p. 218-246.
- ³¹ A relevant issue to this discussion, but which for pressure of space I will not address here, is the role of consumers in determining the type of meat bought and sold. It can be argued that the perception of the “quality” of beef between breeds of cattle was as much a function of meat marketers as consumers themselves. For example, that certain breeds were considered better for jerky than as sources of fresh meat had more to do with transportation and storage concerns on the part of marketers than on the tastes of consumers *per se*. More needs to be researched on this, but for a partial discussion of the culinary value of breeds in terms of zebu, see WILCOX, Zebu’s Elbows, p. 232-234. For the Mexican experience, see PILCHER, Jeffrey M. *Que vivan los tamales!: food and the making of Mexican identity*. Albuquerque: University of New Mexico Press, 1999; PILCHER, Fajitas and the Failure of Refrigerated Meatpacking in Mexico: Consumer Culture and Porfirian Capitalism. *The Americas*, v. 60, n. 3, p. 411-419, Jan. 2004. An excellent examination of this issue for bananas is SOLURI, John. Accounting for Taste: Export Bananas, Mass Markets, and Panama Disease. *Environmental History*, v. 7, n. 3, p. 386-410. July 2002.
- ³² Renato Alves Ribeiro, Campo Grande, interview by author, 29 May 1990.
- ³³ The concept of a form of ethnocentrism or even racism entering into this kind of scientific debate deserves further attention.
- ³⁴ For a discussion of this issue in a broader context see UEKOETTER, Frank. Confronting the pitfalls of current environmental history: an argument for an organizational approach. *Environment and History*, v. 4, p. 31-52, 1998.
- ³⁵ WILCOX, Cattle Ranching on the Brazilian Frontier, p. 329-333.
- ³⁶ See especially PARSONS, James J. Spread of African Pasture Grasses to the American Tropics. *Journal of Range Management*, v. 25, p. 12-17, 1972.
- ³⁷ WILCOX, Cattle Ranching on the Brazilian Frontier, p. 325-328.
- ³⁸ WILCOX, Cattle and Environment in the Pantanal, p. 250-253; “The Law of the Least Effort”, p. 354-357.
- ³⁹ This does not suggest that the impact of fire was insignificant, of course. For more detail, see WILCOX, Cattle and Environment in the Pantanal, p. 248-250; WILCOX, “The Law of the Least Effort”, p. 351-354.
- ⁴⁰ WILCOX, Cattle Ranching on the Brazilian Frontier, p. 340-345; WILCOX, Zebu’s Elbows, p. 244-245.
- ⁴¹ RONDON, J. Lucídio N. *No pantanal e na amazônia em Mato Grosso*. São Paulo: [n. p.], 1974. p. 115. For the same reason many wild animals also died in the flood, up to that time the worst in *pantaneiro* living memory. It seems the dry period of 1960-1974 generated a complacency on the part of new or younger ranchers to the dangers floods could bring to ranching.
- ⁴² FLORES, Dan. Place versus region in Western environmental history, commentary on NEEL, Susan Rhoades. A place of extremes: nature, history, and the American West. In: MILNER, Clyde A. (Ed.). *A new significance: re-envisioning the history of the American West*. New York: Oxford University Press, 1996. p. 134.

Referências bibliográficas

- AMADO, Janaina (Org.). *Frontier in comparative perspectives: the United States and Brazil*, Latin American Program Working Paper 188. Washington: Woodrow Wilson Center, 1990.
- AYERS, Edward L. et al. *All over the Map: rethinking American Regions*. Baltimore: Johns Hopkins University Press, 1996.
- BELL, Stephen. *Campanha gaúcha: a Brazilian ranching system, 1850-1920*. Stanford: Stanford University Press, 1998.

- BORGES, Fernando Tadeu de Miranda. *Do extrativismo à pecuária: algumas observações sobre a história econômica de Mato Grosso - 1870 a 1930*. São Paulo: Scortecci, 2001.
- _____. *Esperando o trem: sonhos e esperanças de Cuiabá*. São Paulo: Scortecci, 2005.
- BRANFORD, Sue; GLOCK, Oriel. *The last frontier: fighting over land in the Amazon*. London: Zed Books, 1985.
- BRANNSTROM, Christian; GALLINI, Stefania (Ed.). *Territories, commodities and knowledges: Latin American environmental history in the nineteenth and twentieth centuries*. London: Institute of Latin American Studies, 2004.
- BURKE, Edmund; POMERANZ, Kenneth (Ed.). *The environment and world history*. Berkeley: University of California Press, 2009.
- CORRÊA, Valmir Batista. *Fronteira oeste*. 2. ed. Campo Grande: Editora UFMS, 2005.
- _____. *Coronéis e bandidos em Mato Grosso, 1889-1943*. 2. ed. Campo Grande, MS: Editora UFMS, 2006.
- CORRÊA, Lúcia Salsa. *História e fronteira: o sul de Mato Grosso, 1870-1920*. Campo Grande, MS: Editora UCDB, 1999.
- CORRÊA Filho, Virgílio. Terras devolutas; evolução do processo de adquiri-las em Mato Grosso. *Revista do Instituto Histórico de Matto-Grosso*, v. 3, p. 65-72, 1921.
- CROSBY, Alfred W. *The Columbian exchange: biological and cultural consequences of 1492*. Westport, CT: Greenwood Press, 1973 (in Spanish: *El intercambio transoceánico: consecuencias biológicas y culturales a partir de 1492*. México: Unam, 1991).
- _____. *Ecological imperialism: the biological expansion of Europe, 900-1900*. New York: Cambridge University Press, 1988.
- DANIELS, Christine; KENNEDY, Michael V. (Ed.). *Negotiated empires: centers and peripheries in the Americas, 1500-1820*. New York: Routledge, 2002.
- DEAN, Warren. *With broadax and firebrand: the destruction of the Brazilian Atlantic Forest*. Berkeley: University of California Press, 1995. (in Portuguese: *A ferro e fogo: a história e a devastação da Mata Atlântica brasileira*. Trad. de Cid Knipel Moreira. São Paulo: Companhia das Letras, 1996).
- DOWNING, T. E. et al. (Ed.). *Development or destruction: the conversion of tropical forest to pasture in Latin America*. Boulder, Colo.: Westview Press, 1992.
- ENDLICH, Rodolfo. A criação do gado vacum nas partes interiores da America do Sul. *Boletim da Agricultura*, v. 4, n. 2, 1903.
- EVANS, Sterling. *The Green Republic: a conservation history of Costa Rica*. Austin: University of Texas Press, 1999.
- FABIANO, Toni. *Expansão e trajetórias da pecuária na Amazônia: Acre, Brasil*. Brasília, DF: Editora UnB, 2007.
- FAMINOW, Merle D. *Cattle, deforestation and development in the Amazon: an economic, agronomic and environmental perspective*. New York: CAB International, 1998.
- FUNES MONZOTE, Reinaldo. *From rainforest to cane field in Cuba: an environmental history since 1492*. Translated by Alex Martin. Chapel Hill, NC: University of North Carolina, 2008 (in Spanish: *De bosque a sabana: azúcar, deforestación y medio ambiente en Cuba, 1492-1926*. Ciudad de México: Siglo XXI, 2004).
- GROVE, Richard H. *Green imperialism: colonial expansion, tropical Island Edens and the origins of environmentalism, 1600-1860*. New York: Cambridge University Press, 1995.
- HECHT, Susanna B. The logic of livestock and deforestation in Amazonia. *BioScience*, v. 43, n. 10, p. 687-695, 1993.

- HEMMING, John (Ed.). *Changes in the Amazon Basin*. Manchester: Manchester University Press, 1985.
- HERNÁNDEZ, Lucina, Comp. *Historia ambiental de la Ganadería en México*. Veracruz: Instituto de Ecología, 2001.
- HUGHES, J. Donald. *An environmental history of the world: humankind's changing role in the community of life*. London and New York: Routledge, 2001.
- IGLER, David. *Industrial cowboys: Miller & Lux and the transformation of the Far West, 1850-1920*. Berkeley: University of California Press, 2001.
- LEAL, Joaquim Ponce. *O conflito campocidade no Brasil (Os homens e as armas)*. 2. ed. Rio de Janeiro: Itatiaia, 1988.
- LEEDS, Anthony; VAYDA, Andrew P. (Ed.). *Man, culture, and animals: the role of animals in human ecological adjustments*. Washington, D. C.: American Association for the Advancement of Science, 1965.
- LEITE, Eudes Fernando. *Marchas na história: comitivas e peões-boiadeiros no Pantanal*. Brasília: Ministério da Integração Nacional; Campo Grande, MS: Ed. UFMS, 2003.
- LISBOA, Miguel Arrojado Ribeiro. *Oeste de S. Paulo, sul de Mato-Grosso; geologia, indústria mineral, clima, vegetação, solo agrícola, indústria pastoril*. Rio de Janeiro: Jornal do Commercio, 1909.
- LONDON, Mark; BRIAN, Kelly. *The Amazon in the age of globalization*. New York: Random House, 2007.
- MARGULIS, Sergio. *Causes of deforestation of the Brazilian Amazon*. Washington, D. C.: World Bank, 2003.
- MARQUARDT, Steve. Green Havoc: Panama disease and labor process. *American Historical Review*, v. 106, p. 49-80, 2001.
- McCOOK, Stuart. *States of nature: science, agriculture, and environment in the Spanish Caribbean, 1760-1940*. Austin: University of Texas Press, 2002.
- McNEILL, John R. *Something new under the Sun: an environmental history of the twentieth-century world*. New York: W.W. Norton & Company, 2000.
- MELVILLE, Elinor Gordon Ker. *A plague of sheep: environmental consequences of the conquest of Mexico*. Cambridge: Cambridge University Press, 1994 (in Spanish: *Plaga de ovejas: consecuencias ambientales de la Conquista de México*. México: Fondo de Cultura Económica, 1999).
- MILLER, Shawn William. *Fruitless trees: Portuguese conservation and Brazil's Colonial Timber*. Stanford, Calif.: Stanford University Press, 2000.
- MILNER, Clyde A. (Ed.). *A new significance: re-envisioning the history of the American West*. New York: Oxford University Press, 1996.
- NASH, Roy. *The conquest of Brazil*. New York: AMS Press, 1924[?].
- NOVIS NEVES, Maria Manuela Renha de. *Leões e raposas na política de Mato Grosso*. Rio de Janeiro: Mariela, 2001.
- O'CONNOR, James. What is environmental history? Why environmental history? *Capitalism, Nature, Socialism*, v. 8, n. 2, p. 3-29, June 1997.
- PADUA, José Augusto. *Um sopro de destruição: pensamento político e crítica ambiental no Brasil escravista (1786-1888)*. 2. ed. Rio de Janeiro: Jorge Zahar, 2004.
- PALACIO, Germán; ULLOA, Astrid (Ed.). *Repensando la naturaleza: encuentros y desencuentros disciplinarios en torno a lo ambiental*. Leticia: Universidad Nacional de Colombia, Imani, 2002.
- PARSONS, James J. Spread of African Pasture Grasses to the American Tropics. *Journal of Range Management*, v. 25, p. 12-17, 1972.

- PESAVENTO, Sandra Jatahy. *República velha gaúcha: charqueadas, frigoríficos, criadores*. Porto Alegre: Movimento; Instituto Estadual do Livro, 1980.
- PILCHER, Jeffrey M. *Que vivan los tamales!: food and the making of Mexican identity*. Albuquerque: University of New Mexico Press, 1999.
- _____. Fajitas and the failure of refrigerated meatpacking in Mexico: consumer culture and porfirian capitalism. *The Americas*, v. 60, n. 3, p. 411-419, Jan. 2004.
- QUEIROZ, Paulo Roberto Cimó. *As curvas do trem e os meandros do poder: o nascimento da estrada de ferro noroeste do Brasil (1904-1908)*. Campo Grande, MS: Editora UFMS, 1997.
- _____. *Uma ferrovia entre dois mundos: a E. F. Noroeste do Brasil na primeira metade do século 20*. Baurú, SP: Edusc, 2004.
- RADKAU, Joachim. *Nature and power: a global history of the environment*. Translated by Thomas Dunlap. German Historical Institute, Washington, D. C. New York: Cambridge University Press, 2008.
- REDCLIFT, Michael R. *Frontiers: histories of civil society and nature*. Cambridge, MA: MIT Press, 2006.
- RONDON, J. Lucídio N. *No pantanal e na amazônia em Mato Grosso*. São Paulo: [n. p.], 1974.
- SCHMINK, Marianne; WOOD, Charles H. (Ed.). *Frontier expansion in Amazonia*. Gainesville: University of Florida Press, 1984.
- _____. *Contested frontiers in Amazonia*. New York: Columbia University Press, 1992.
- SHANE, Douglas R. *Hoofprints on the forest: cattle ranching and the destruction of Latin America's Tropical forests*. Philadelphia: Institute for the Study of Human Issues, 1986.
- SMITH, Mark. The political economy of sugar production and the environment of Eastern Cuba, 1898-1923. *Environmental History Review*, v. 19, n. 5, p. 31-48, Winter 1995.
- SOLURI, John. Accounting for taste: export bananas, Mass Markets, and Panama Disease. *Environmental History*, v. 7, n. 3, p. 386-410, July 2002.
- _____. *Banana cultures: agriculture, consumption, and environmental change in Honduras and the United States*. Austin: University of Texas Press, 2005.
- SLUYTER, Andrew S. The ecological origins and consequences of cattle ranching in sixteenth-century new Spain. *Geographical Review*, v. 86, n. 2, p. 161-177, 1996.
- _____. From Archive to Map to Pastoral Landscape: a spatial perspective on the livestock ecology of sixteenth-century new Spain. *Environmental History*, v. 3, p. 508-528, 1998.
- STANFIELD, Henning et al. *The livestock, environment and development initiative. Livestock's Long Shadow: Environmental issues and options*. Rome: Food and Agriculture Organization, 2006.
- STARRS, Paul F. *Let the cowboy ride: cattle ranching in the American West*. Baltimore: Johns Hopkins, 1998.
- TUCKER, Richard P. *Insatiable appetite: the United States and the ecological degradation of the tropical world*. Berkeley: University of California Press, 2000.
- UEKOETTER, Frank. Confronting the pitfalls of current environmental history: an argument for an organizational approach. *Environment and History*, v. 4, p. 31-52, 1998.
- VAN AUSDAL, Shawn. *Pasture, profit, and power: an environmental history of cattle ranching in Colombia, 1850-1950*. Geoforum (forthcoming: <http://www.sciencedirect.com/doi:10.1016/j.geoforum.2008.09.012>).

WILCOX, Robert. Cattle and environment in the Pantanal of Mato Grosso, Brazil, 1870-1970. *Agricultural History*, v. 66, p. 232-256, Spring 1992.

_____. *Cattle ranching on the Brazilian Frontier: Tradition and innovation in Mato Grosso, 1870-1940*. Ph.D. Dissertation, Ann Arbor, MI: UMI Dissertation Information Service, 1992.

_____. The law of the least effort: cattle ranching and the environment in the Savanna of Mato Grosso, Brazil, 1900-1980. *Environmental History*, v. 4, n. 3, p. 338-368, July 1999.

_____. Ranching modernization in Tropical Brazil: foreign investment and environment in Mato Grosso, 1900-1950. *Agricultural History*, v. 82, n. 3, p. 366-392, Summer 2008.

WOOD, Charles H.; PORRO, Roberto (Ed.). *Deforestation and land use in the Amazon*. Gainesville, FL: University Press of Florida, 2002.

WORSTER, Donald. *Under Western Skies: Nature and history in the American West*. New York: Oxford University Press, 1992. p. 34-52.