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SUSTAINING THE STEPPES: A GEOGRAPHICAL HISTORY OF PASTORAL LAND USE IN MONGOLIA*

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ABSTRACT. Recent shifts in Mongolia's politics and economy have changed pastoral land-use patterns and charged debate over how pasturelands are allocated and regulated in a market economy. Absent has been any detailed understanding of the historical geography of pastoral tenure and land-use patterns in Mongolia prior to the socialist era and the collectivization of livestock husbandry. An overview and case study of changing tenures and land-use patterns suggests that in prerevolutionary Mongolia wealth and poverty determined herders' mobility and access to pasture resources; no less is true today. Historical data also reveal dual formal and informal regulatory institutions extant in the past that coordinated patterns of seasonal movement. This amounted to an unofficial tenure system and has contributed to Mongolia's legacy of ecologically and socially sustainable pastoralism. *Keywords:* land tenure, land use, Mongolia, nomads, pastoralism.

In 1990, after seventy years of Soviet Union-influenced communist rule, Mongolia (formerly the Mongolian People's Republic) held its first democratic elections. By 1992 liberalization of the economy was under way, and virtually all state-owned livestock had been privatized, dismantling herding collectives. For herders, privatization resulted in loss of the formal institutions that regulated pasture use, in reduced social services, in declining trade and access to markets, in increased numbers of herding households, and in greater poverty and differentiation in wealth. These changes in herders' livelihoods altered patterns of pastoral land use and led to high rates of out-of-season and year-round grazing of key resources, to trespassing on customary winter and spring reserve pastures, and to declines in the distance and frequency of seasonal nomadic moves (Fernández-Giménez 1997).

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Since privatization, Mongolian policymakers and foreign advisers have debated appropriate ways to regulate pasture use in this nation of nomads as Mongolia enters, by fits and starts, the market economy (PALD 1993; Swift 1995; Agriteam Canada 1997). Missing from this debate is the historical context from which the present situation emerged. What formal and customary institutions governed pasture use in the collective era and before? How did patterns of pastoral land use and institutions regulating pasture use change in the centuries preceding communism and democracy? These questions resonate beyond the borders of this sparsely populated steppe nation. In an era when many people question the future of pastoralism around the globe, Mongolia stands out as a nation in which pastoralism has thrived and where—if anywhere—it may be expected to persist as an ecologically, economically, and socially sustainable way of life. The lessons to be learned from Mongolia's past are therefore important to the prospects of pastoral livelihoods and rangeland ecosystems the world over.

I examine how the state, formal institutions such as monasteries, and herders' customary institutions influenced pastoral land-use patterns in Mongolia from the emergence of the Qing Dynasty, following the decline of the Mongol Empire, until the breakup of the collective system in 1990. My focus is historical, because descriptions of the current situation can be found elsewhere and because what other work universally lacks is the context provided by a detailed historical-geographical analysis (Mearns 1993, 1996; Potkanski and Szyrkiewicz 1993; Swift 1995; Bruun and Odgaard 1996; Humphrey and Sneath 1996).

In showing how past administrative organization and social institutions structured land-use patterns, a number of themes emerge that are still relevant. With each overt shift in the political economy of Mongolia, the territories of nomadic groups shrank in size, controls over animal movements became more rigid, allocation of pasture was more closely controlled, tenure became more individuated, and the gap between formal and informal regulation of resource use widened. Nevertheless, in each case the ruling powers—Manchu, "feudal," socialist—were forced to capitulate to the unalterable environmental constraints on livestock production in Mongolia. Political leaders allowed herders the flexibility to move in times of disaster, while they maintained and enforced movement patterns and herding practices that ensured adequate spatial and temporal distribution of livestock in relation to resources. This historical review also shows how lack of access to transportation limited the mobility of poor herding families, and an inability to migrate freely over long distances in turn restricted herders' access to prime grazing lands and the means to increase their herds. Finally, this analysis reveals Mongolia's history of dual formal and informal regulation of seasonal movements, which constituted a functioning system of tenure and which appears to have been largely successful over the long term in maintaining ecologically sustainable patterns of pastoral land use.

In this essay, the ecological setting of Mongolian pastoralism is first briefly described. A summary of the major developments in pastoral land use in the first cen-



FIG. 1—A khot ail in Bayan-Ovoo Sum uses the traditional three-sided stone corral as a winter-campsite bedding ground for its animals. Traditionally, markers such as this corral signified the customary users' rights to a campsite, and stockpiles of dried dung for fuel indicated their intention to camp there in a given winter. (Photograph by the author, March 1995)

turies of the Mongol state follows. The third section offers a more detailed account of land use and land tenure during Manchu rule, including a case study from the Erdene Bandidaagiin Khotagiin Khoshuun, an ecclesiastical territory located in what is today Bayankhongor Aimag. The fourth and fifth sections continue the narrative of changes in Mongolia's political economy and the concurrent alterations in land use and land tenure in the early communist and collective eras, with a brief overview of the changes since privatization in the sixth section. A final section summarizes the findings and discusses their implications for current policy.

THE ECOLOGICAL SETTING OF MONGOLIAN PASTORALISM

Mongolia's vast grasslands, which constitute roughly 70 percent of the country's 1.56 million square kilometers, fall into three major ecological zones: the mountain-steppe, the steppe, and the desert-steppe. Most of Mongolia's 32 million head of livestock (camels, cattle, yaks, horses, sheep, and goats) graze on these steppe lands, though some also make use of forested ranges, high mountain pastures, and the scant forage of the true desert. Mongolia's pastoral economy relies on extensive livestock production rather than on intensive production subsidized by cultivated fodder crops. Virtually all of the nutritional needs of Mongolia's herds are met by grazing on wild grasses and forbs or by browsing on shrubs. A small amount of wild

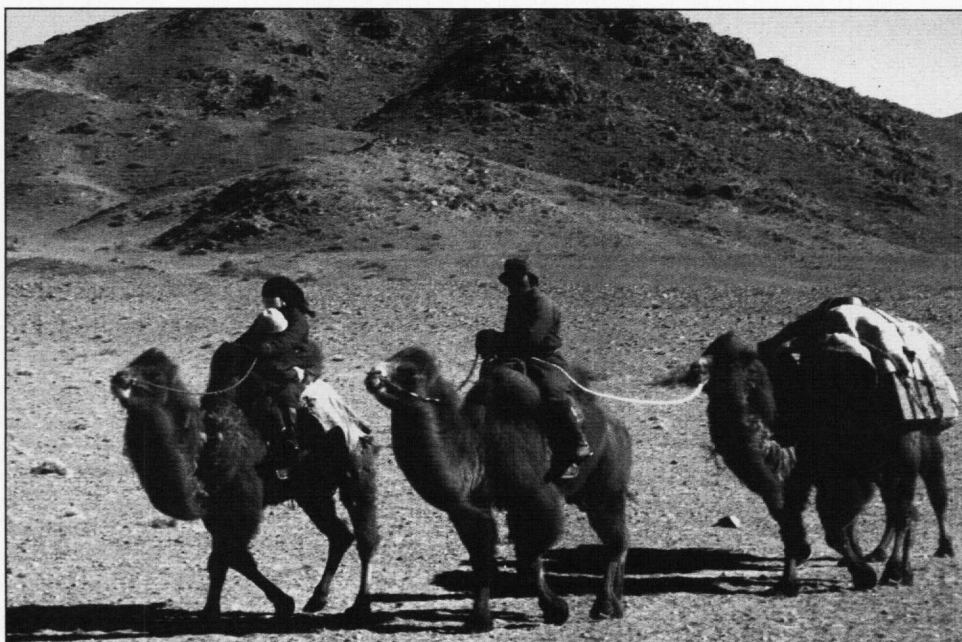


FIG. 2—A young herding family from Jinst Sum makes an early move to spring pasture after a winter drought in 1994–1995, using the traditional mode of transport in the desert-steppe: camels. (Photograph by the author, February 1995)

hay is cut, dried, and stored in the more productive mountain-steppe areas, but most herds rely on standing dead forage during the winter and spring seasons, when fresh grass is unavailable. This requires that herders set aside “reserve” pastures for use during the nongrowing seasons and collectively refrain from grazing these areas at other times of the year.

Mongolia’s climate is continental, with warm, wet summers and cold, dry winters, often made extremely frigid by strong winds that blast across the steppes unimpeded by natural or manmade windbreaks. Many parts of the country experience periodic severe winter storms that often kill 20 percent or more of the livestock in a given region. These storms are known as *dzuud*, a term that more broadly refers to any circumstance that renders forage unavailable to livestock (including trampled plants, deep snow, or a hard, icy crust that animals cannot break with their hooves).

Much of Mongolia receives relatively little precipitation, and most of what it does receive falls during the summer. In the steppes of Bayankhongor Aimag, from which my case study is drawn, precipitation averages 200 millimeters a year, whereas in the desert-steppe it averages 95 millimeters. The distribution of rainfall over time and space is extremely variable, particularly in the desert and desert-steppe zones. In these areas, the available data suggest that interannual variability in rainfall influences the productivity and composition of vegetation to a greater degree than does grazing pressure (Fernández-Giménez and Allen-Díaz 1999).

TABLE I—SOCIAL AND ADMINISTRATIVE ORGANIZATION IN MONGOLIA

SCALE	NUMBER OF HOUSEHOLDS	PRE-COMMUNIST (BEFORE 1924)	COLLECTIVE (1960–1990)	PRIVATIZATION (1990S)
Herding camp	1	Ail	Ail	Ail
	1–2		Suur	
	2–10	Khot ail		Khot ail
Neighborhood	20		Khesig	
	20–80	Neg nutgiinkhan		Neg nutgiinkhan
	50–100	Bag, otok	Brigade	
Local administration	150–200	Somon		Bag
	500–1,000		Sum, negdel	Sum
Provincial administration	1,000–10,000	Khoshuun, aimag	Aimag	Aimag

Source: Mearns 1996.

In the steppe and mountain-steppe, grazing plays a significant role in determining the composition and productivity of vegetation, although precipitation is still a driving factor (Fernández-Giménez and Allen-Díaz 1999). Over millennia, Mongolian herders have developed a sophisticated system of animal husbandry that enables them to make efficient use of the diverse landscapes of Central Asia and the heterogeneous resources within them. By grazing a diversity of livestock species, by using their accumulated knowledge of climate, animal physiology and behavior, and plant ecology, and by employing a mobile and flexible nomadic herding strategy, pastoralists have been able to exploit productive patches as well as less productive landscapes to obtain a reliable output of goods and services from their animals with few, if any, external inputs.

Historically, in both the prerevolutionary era and the collective era, the general pattern of seasonal migrations, with many variations depending on local climate and geography, was that herders spent the warm summer months near natural water sources such as rivers, lakes, or springs, often in broad valleys and at lower elevations. During the winters, herders made use of pastures distant from water (and therefore unusable in the summer), relying on snowfall for their domestic and livestock water. Winter pastures were often at higher elevations, in the mountains or foothills, where herders sought protection from the winds in sheltered valleys or canyons or on the leeward side of outcrops (Figures 1 and 2).

THE MONGOL EMPIRE AND THE ORIGINS OF THE MONGOL THEOCRACY

The first of two major developments in the relationship of Mongolian nomads to their lands took place when Chingghis Khan granted fiefs to his political allies (ca. 1206–1227), giving them control over the pastures within their boundaries and the authority to extract labor and taxes from the serfs who dwelled there (Jagchid and Hyer 1979). This marked the first time that groups of herders were associated with specific or fixed territories.

The second major development followed the successful reintroduction of Tibetan Buddhism into Mongolia in 1586. This was the establishment of an ecclesiastical social hierarchy that mirrored the quasi-feudal secular social order. Powerful lamas were granted their own territories and commanded labor and tribute from their ecclesiastical subjects or *shabinar*, who herded the monasteries' flocks, a major source of church wealth. The church became a dominant political and economic force in Mongolia, with monasteries serving as hubs of trade and centers of political power, in addition to providing education and spiritual guidance (Miller 1959).

THE MANCHU COLONIAL PERIOD, 1691–1911

In 1691 the northern and western Mongols finally submitted to the authority of the Manchu and became their colonial subjects. A Manchu colonial administrative structure was superimposed on the existing Mongol political and social organization, rigid territorial lines were drawn and enforced around principalities, and a colonial legal code was issued. The Manchu divided the *aimag* (provinces) of the three Khalkha khans into first 34 and later some 100 military-territorial units called *khoshuun*, which replaced the former principalities, further dividing and circumscribing feudal territories (Bawden 1968).¹

SOCIAL ORGANIZATION OF HERDING UNDER MANCHU RULE

Within the formal territorial unit of the *khoshuun*, herders aggregated into loose territorial-administrative units called *bag* (*otok* in the case of temple territories), consisting of 50–100 households that migrated together over the same territory (Table I). *Somon* consisting of 150–200 households were nonterritorial administrative divisions maintained for military purposes. Each *bag* had a *darga* (headman) and an appointed tax collector. The most economically important social grouping, however, was the *khot ail* (herding encampment), which consisted of two to twelve households (*orokh* or *ail*) that camped and traveled together. The *khot ail* usually had a designated leader, determined by descent, wealth, or experience, often an elder (Szyrkiewicz 1982; Bold 1996). To save labor, households within a *khot ail* pooled their animals into herds, each family in turn taking the animals to pasture on its "lucky day." *Khot ail* households cooperated on labor-intensive tasks such as cutting hay, making felt, and seasonal migrations. Membership in a *khot ail* was flexible and varied from year to year and from season to season. In many cases the *khot ail* functioned as a form of social safety net, allowing poor households to benefit from the assistance of wealthier households in informal exchange for their labor.

In some areas intermediate social groupings existed at the level of aggregations of *khot ail* occupying a single valley or surrounding a desert water hole. Such clusters are generically called *neg nutgiinkhan* (people of one place). These neighborhood groups lacked formal leadership and came together primarily on ritual occasions. Slajov Szyrkiewicz suggests that some *neg nutgiinkhan* may have marked and maintained key resources such as wells, hay meadows, or pastures rich in wild onions for their exclusive collective use (1982). Others doubt that local neighborhood groups

had any such functions or question the existence of such groups altogether (Sneath 1993; Bold 1996).

LAND TENURE UNDER MANCHU RULE

Legal codes promulgated in the seventeenth and early eighteenth centuries codified aspects of the customary law of the steppe, specifying which areas were open for use by monastery herds and which areas (sacred sites and the headquarters of secular princes) were forbidden, articulating water rights (he who digs a well has first rights but is obliged to give water to the steeds of passing travelers), and codifying the traditional "first come, first served" law of the steppe with regard to nomadic campsites (Table II).

Prior to Manchu rule, herders were permitted to move from one principality to another, altering allegiances. This changed with colonial administration. The colonial regulations of 1789 state that princes and their subjects alike were forbidden from leaving their natal *khoshuun* (Riasanovsky 1965), although in some cases cross-border use may have been allowed for a fee (Bawden 1968). Despite the strict enforcement of *khoshuun* boundaries, border areas were sometimes used jointly (Vreeland 1957; Pozdneyev 1971). The Manchu administration apparently realized the need for cross-border movement in times of drought or climatic disaster, while seeking to prevent such disasters from facilitating migration among *khoshuun*, as evidenced in an 1885 edict by the ruling prince of Tsetsen Khan Aimag: "In the event of a drought or *dzuud*, in order not to keep livestock from their pasture, each person must carefully examine the situation, searching for a means not to scatter too far, and must return immediately to his original *nutag* when the weather improves" (Natsagdorj 1963, 107; my translation). *Nutag* roughly translates as territory and usually refers to the territory circumscribing all four customary seasonal pastures of a given nomadic group—the territory within which it normally migrates (Vladimirtsov 1948; Szykiewicz 1982).

The land within a *khoshuun* was under the exclusive authority of the prince, and its control by the hereditary nobility formed the basis of the so-called feudal pastoral economy of prerevolutionary Mongolia (Vladimirtsov 1948). The extent of this control over land has been questioned (Maiskii 1921; Bawden 1968; Bosson 1995). Except for the case in which a noble might cede a portion of his territory to a monastery, the princes had no right to alienate land.

A blend of formal and customary regulation governed the use of pasture. The degree of regulation and specificity in pasture allocation varied among ecological zones and among *khoshuun*, depending on their leadership and local geography. In some *khoshuun*, pastures for special purposes, such as autumn fattening, winter camps, or the annual livestock census, were officially set aside and their use closely monitored (Cheney 1966; Simukov 1993). In *khoshuun* with large populations of *shabinar*, seasonal grazing areas and migratory routes were dictated by the leaders of each herding contingent (the camel herders or sheep herders), according to the wishes of the head lama or prince (Simukov 1993). In other *khoshuun*,

TABLE II—CHANGES IN MONGOLIAN LAND-USE PATTERNS, LAND-USE REGULATION, AND LAND TENURE

MONGOL EMPIRE (1206–1690)	MANCHU RULE AND AUTONOMY (1691–1911)	EARLY COMMUNISM (1924–1959)	COLLECTIVE (1960–1990)	PRIVATIZATION (1990s)
<i>Regulatory Institutions</i>				
Clans and tribal groups	Monastery and secular nobility	Neighborhood groups (little formal regulation)	Collective	None
	Neighborhood groups (bag)			
<i>Land-Use Patterns</i>				
Wide-ranging seasonal migrations	Confined to khoshuun boundaries	Reduced distance of migrations and diversity of ecological zones	Confined to sum or brigades	Further reduced distance and frequency of moves
	Long distances, frequent moves, multiple ecological zones	Year-round use of desert riparian areas	Average of four moves per year	Less otor
			Otor enforced	Year-round use of desert riparian and reserve pastures
			Diversity of ecological resources reduced	Increased trespassing
			Many shelters built	Animals concentrated near towns and roads
<i>Land-Use Regulation</i>				
Clan chiefs signal and direct movement	Nobles direct movement	No enforced formal regulation of movement	Collectives enforce seasonal moves and otor	No formal regulation or enforcement
	Grazing prohibited in some areas	Neighborhood groups migrate together	Transport provided by collectives	Lack of coordinated seasonal movements
	Community sanctions for out-of-season use		Emergency reserve pasture areas	
<i>Land Tenure and Legal Framework</i>				
Chinggis Khan and his successors grant fields for political loyalty	Nobles allocate; no right to alienate	Customary rights within administrative units	Collectives allocate pasture, often along customary lines	Customary rights weak
Customary law of the steppe	Lack of transport restricts access of the poor		All property state owned	Informal institutions of access in flux
	Law of the steppe codified: first come, first served		Disputes resolved by brigades and collective khural	Implementation of 1994 land law proceeding slowly (1999) (pasture-leasing system proposed)
	Disputes resolved by tamga		Interterritorial use agreements	Disputes resolved by local governments (bag and sum)
	Interterritorial use of agreements			Shelters privatized
	By the 1800s, quasi-private rights to hay, shelters, and winter camps in some areas			

the nobles formed a special bag together with their serfs and migrated in a particular area, while the remaining populace was free to move about the rest of the khoshuun as it wished. The areas claimed by the nobility were routinely the choicest pasture areas (Pozdneyev 1971; Shirendyb 1976). Although some authors allude to very specific allocations of khoshuun pastures by nobles to a khot ail or even to an individual household, circumscribed rights to pasture were rare outside the Khangai Mountain zone and a few other khoshuun where narrow, clearly defined, and highly productive valley pastures encouraged the allocation of pasture areas to small groups or individuals (Vreeland 1957; Natsagdorj 1963; Pozdneyev 1971; Shirendyb 1976).

The degree of specificity in rights to pasture varied among seasons as well as khoshuun. Rights to winter camps and pastures were more defined and ingrained than were rights to summer and autumn pastures, and they adhered to smaller groups of herders (Maiskii 1921; Vreeland 1957; Natsagdorj 1963; Cheney 1966). Typically these rights were based on customary use of a particular location by the same khot ail for many years. It was not uncommon for a household to claim several different winter camps, alternating between them in different years or camping at one in early winter and another in late winter (Vreeland 1957). Building a small stone corral on the site, amassing a dung pile for fuel, or making other noticeable preparations for winter use indicated possession of a winter camp. If a family let it be known that they did not intend to use one of their traditional sites in a given year, any other herder was free to make use of it (Vreeland 1957; Bawden 1968). By the late nineteenth century, rights to winter campsites had become informal private property in some places, and they were bought, sold, and rented out (Natsagdorj 1963; Bawden 1968). In the northern khoshuun, near the Siberian border, herders erected more permanent, wooden shelters for livestock (Maiskii 1921; Cheney 1966; Pozdneyev 1971). Disputes between individual herders were settled by the herders or sometimes with intervention from the bag darga. If a conflict escalated, higher authorities in the administrative hierarchy could be appealed to. The *tamga* (administrative office) was officially responsible for the arbitration of disputes. The few disputes recorded were usually between groups of herders or whole tribes with conflicting claims to pasture areas. These disputes indicate, among other things, the degree to which ordinary herders considered customary grazing lands as common property, rather than the exclusive property of the noble elite.

PASTORAL LAND USE UNDER MANCHU RULE

Patterns of pastoral land use during the Manchu era varied among ecological zones. Regulation of seasonal movement unofficially controlled land use and access to resources. The timing of circulation among the seasonal pastures was signaled by the movement of the prince's herds and camp (Maiskii 1921). Specific days were often set for such moves, according to the omens associated with the day, and herders of the same bag generally moved together. Although direct references to community-imposed penalties for improper timing of movement are lacking, indirect references

suggest that communal sanctions existed. Aleksei Matveevich Pozdneyev wrote of one poor herder who was just leaving his winter camp in late June 1892:

This was a nomadic move from winter pastures to summer pastures; it was, of course, very late, but in general the very poor Mongols here seldom move, first, because it is very difficult for them, due to the lack of transportation and, second, because of the extremely limited scale on which they raise cattle, the community does not press their moving, taking into consideration the fact that they do not consume much grass, and permits them to stay on the water meadows until these meadows are divided into plots and are auctioned off to individuals for hay-making. (Pozdneyev 1971, 5)

Herders with more animals, this observation suggests, were compelled to move away from winter pastures by other members of the herding community. Pozdneyev later described how poor herders were left behind during a drought, while those who were better off sought fresh pasture. When the rains arrived, the poor informed their wealthier neighbors of the change in the weather and grass, so that they might return to their native *nutag*. Even in the absence of preferential pasture rights granted by a *khoshuun* prince, access to transportation enabled wealthier herders to appropriate the best pastures and to avoid climatic disasters. The wealthy moved first and were able to be more independent. The poor, if and when they did move, often relied on the assistance of other households in the *khot ail* or *bag* (Vladimirtsov 1948; Simukov 1993).

Both Batnasan (1972) and Charles Bawden (1968) mention *otor*, the rapid deployment of a subgroup of the household and herds to a distant pasture. There are several different types of *otor*, but each involves a more permanent base camp and a mobile satellite camp. The practice, which emerged in the late nineteenth century, was widely promoted in the collective era because it facilitated an efficient and ecologically sound use of pastures while also encouraging a more settled lifestyle.

PRE-1921 PASTORAL LAND USE IN ERDENE BANDIDAAGIIN KHOTAGIIN KHOSHUUN

The disparate sources on the history of Mongolian nomads make it difficult to form a clear idea of how changes in the political, social, and economic realms affected land use in any particular place, especially because local political and ecological conditions varied throughout the country. The record provided by the Russian explorer A. D. Simukov (1993), together with research by Mongolian ethnographers and geographers (Batnasan 1972; Bazargur, Chinbat, and Shirevadja 1989) and fieldwork I conducted in 1994-1995, facilitate a more localized picture of changes in pastoral land use throughout the twentieth century in the eastern part of present-day Bayankhongor Aimag.

Until 1924, Erdene Bandidaagiin Khotagiin Khoshuun was the territory of the Lamiin Gegen, the second wealthiest lama in Mongolia after the monarch, the Jebtsamdamba Khutukhtu. The *khoshuun* extended from the crest of the Khangai Mountain Range to the deep Gobi, was bisected by the Tuin River, and included the large desert lake, Orog Nuur, as well as Ikh Bogd Mountain, the highest peak in the

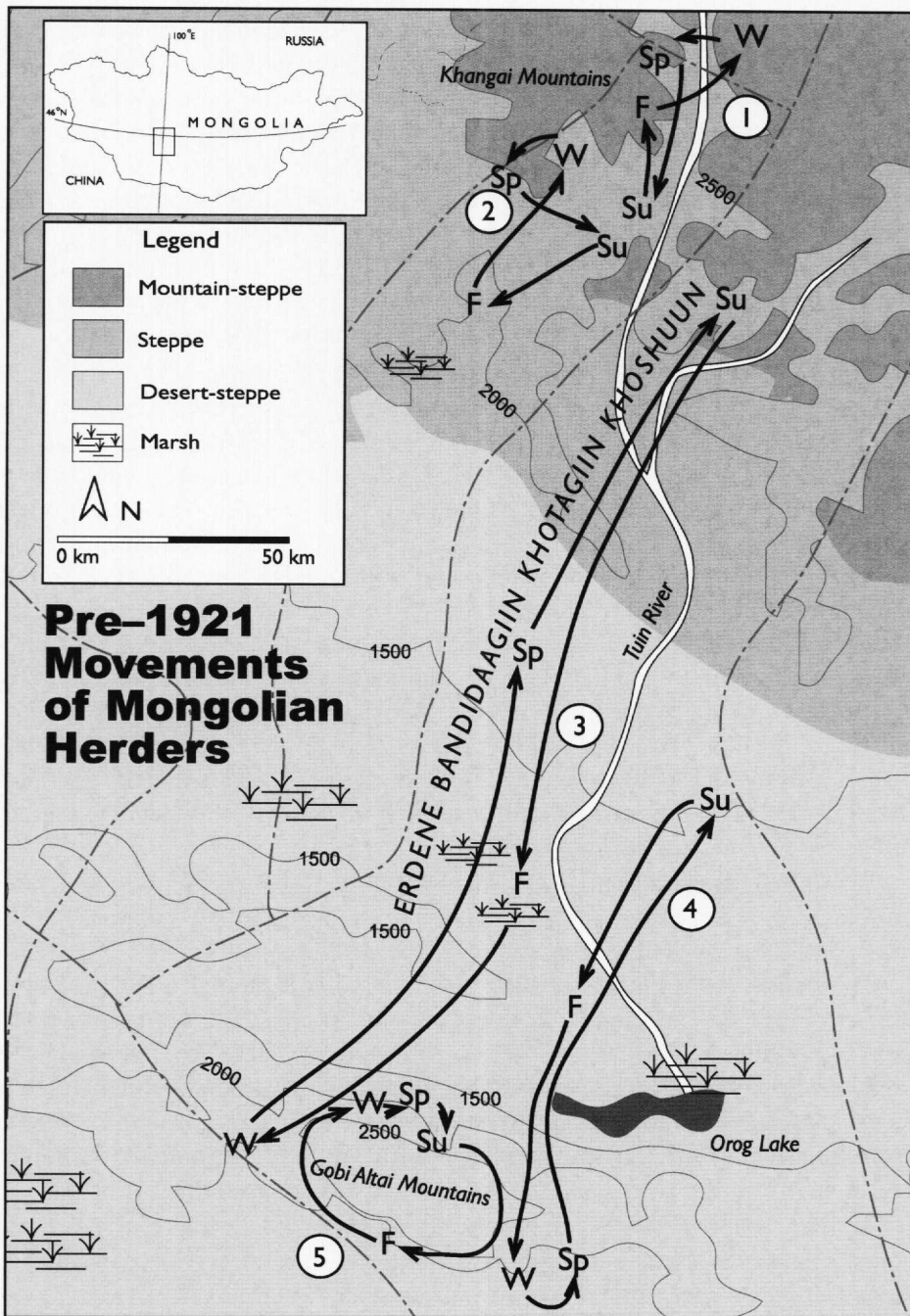


FIG. 3—Prerevolutionary seasonal movement patterns of the major groups of herders identified by A. D. Simukov in Erdene Bandidaagiin Khotagiin Khoshuun, Mongolia. Key to numbers in circles: 1. Khangai cattle herders; 2. Cattle herders of the middle wells; 3. Nomadic herders of the monastery's sheep and horses; 4. Herders of the monastery's camels; 5. Cattle herders of Ikh Bogd Mountain. Sources: Simukov 1993; base map adapted from *Bayankhongor Aimag Atlas* 1989, 7, 14.

Gobi Altai Range (Figure 3). Erdene Bandidaa was located in Sain Noyon Khan Aimag and covered approximately 20,000 square kilometers (the territory encompassing today's Bayanlig, Bayangobi, Bogd, Ulziit, Jinst, Shine Jinst, and Erdenetsogt Sum). The holdings of the *gegen* (a title used in reference to an incarnate lama) in the mid-nineteenth century included 5,279 camels, 4,884 horses, 1,774 cattle, and 18,070 sheep and goats. His subjects comprised 363 households, to whom monastery livestock were allocated as follows: 65 camel-herding households, 34 cattle-herding households, 200 small stock-herding households, and 64 horse-herding households (Batnasan 1972, 117). According to Simukov, about 70 percent of the households in the *gegen*'s *khoshuun* took part in grazing the monastery herds (1993, 49).

Simukov traveled to the territory encompassed by Erdene Bandidaa in 1935, collecting data on the then-current migration routes and interviewing herders about their lives and practices before the *gegen*'s livestock were confiscated and redistributed in 1929. He reported that the herders of Erdene Bandidaa were divided into six groups, four of which herded most of the monastery livestock. These groups were distinguished by the dominant species in their herds and by the migration routes they followed. Each group had its own leader, appointed by the monastery, who selected households to herd monastery stock, directed the migrations, and allocated other obligations to the monastery among the households under his supervision. In addition to herding the monastery stock, the *gegen*'s herders were required to collect, process, and deliver to the monastery quotas of particular livestock products and to provide lime and wood for construction and juniper wood for use in rituals. Monastery herders usually herded their own stock in addition to that of the church. The most skilled and successful—and wealthiest—herders were selected to tend the monastery herds (Simukov 1993).

The six groups that Simukov identified were: Khangai cattle herders, with herds dominated by yaks,² who migrated entirely within the mountain-steppe zone (Figure 4); cattle herders of the middle wells, who herded a small number of sheep for the church in addition to their own cattle-dominated herds; nomads who herded the monastery's sheep and horses, covering 300–500 kilometers a year; herders who took the monastery's large camel herds over a route similar to that followed by the nomads who herded the monastery's sheep and horses; cattle-and-yak herders on Ikh Bogd Mountain; and Gobi sheep-and-goat herders unaffiliated with the monastery, who migrated entirely south of Ikh Bogd Mountain, spending winters on the mountain's southern slopes and the rest of the year in areas to the south.

Simukov emphasized the monastery's important role in directing the movements of herders and in allocating and controlling pasture use in specific parts of the *khoshuun*. He pointed out that from an administrative point of view it was convenient to have all of the monastery's herders migrate at the same time, so they would not be spread out over a large area. Through the appointed leaders of each herding group, the *gegen* regulated and enforced the timing of movements.

The seasonal use of particular pasture areas was likewise controlled. The *gegen* required most of his herds to camp in summer in the vicinity of the monastery, in or-

der to fulfill their production quotas as well as to provide the monastery with fresh dairy products. This was particularly important for certain ritual events during which large numbers of lamas gathered at the temple. This requirement compelled herders to make long-distance moves and precluded out-of-season grazing of winter and spring ranges. The pastures around Orog Nuur and the lower reaches of the Tuin River were reserved for the autumn livestock count, strictly patrolled and regulated, and their use at other times of the year was forbidden. One likely reason for this is that autumn is the crucial time period for fattening livestock before the onset of winter, and desert-steppe pastures are particularly valued for this purpose. Although definitive evidence is lacking, it also seems that at least one group of non-monastery herders, who herded sheep and goats, was relegated to the sparsest and least diverse pastures. This was perhaps because their traditional use area was distant from the monastery, making it administratively inconvenient to allocate monastery herds to them. Or it may be that they were denied access to better pastures because they were not herding the *gegen's* stock (Simukov 1993).

THE EARLY COMMUNIST PERIOD, 1924–1959

In 1924, after ten years of autonomy from Chinese rule and three years of transition, the Mongolian People's Republic (MPR) was founded following the death of the eighth bogdo *gegen*. By 1925 both the secular and ecclesiastic feudal systems had been abolished, and the nobility could no longer extract *corvée* (Bawden 1968). The *khoshuun* were abolished as administrative units, and 300 *sum* (districts), were established as territorial/administrative units, ostensibly on the basis of scientific criteria (Cheney 1966).

Between 1929 and 1932, a violent period in Mongolian history that came to be known as the "Left Deviation," livestock were confiscated from nobles and the church and redistributed to other herders. Religious life was violently suppressed and outlawed, nearly all of the temples in Mongolia were razed, and thousands of lamas were executed, sent to concentration camps, or forced to renounce their vows.

An unsuccessful attempt at forced collectivization in the early 1930s resulted in a sharp decline in the livestock population: Herders slaughtered their animals or drove them into China to avoid confiscation. Over the course of the next several decades, the MPR central government took a series of measures to improve faltering livestock productivity while encouraging collectivization, this time on a more voluntary basis (Rosenberg 1977).

In 1935, after the *gegen's* livestock were confiscated, Simukov recorded migration patterns in the territory that had been encompassed by the Erdene Bandidaagiin Khotagiin Khoshuun (1993) (Figure 4). He determined that, despite the liquidation of the *gegen's* herds and the dissolution of the monastery's control of livestock production, nomadic migrations in the area remained largely as before, with notable exceptions. The same basic division of herding groups and types of movement persisted. The middle-well herders were few in number, had small herds, and concentrated on raising Mongol cattle.

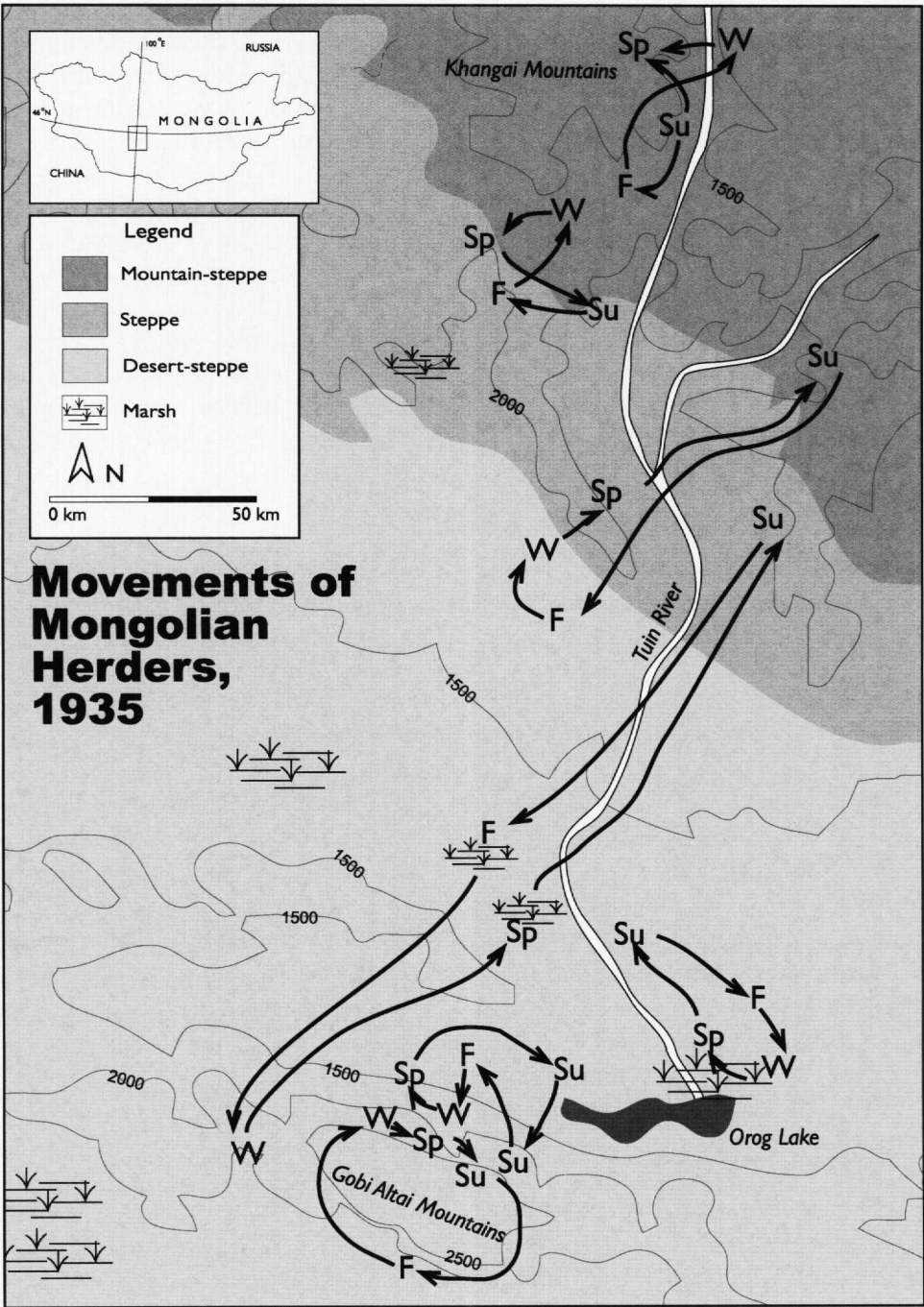


FIG. 4—Seasonal movement patterns of the major groups of herders identified by A. D. Simukov in 1935 in the former Erdene Bandidaagiin Khotagiin Khoshuun, Mongolia. Sources: Simukov 1993; base map adapted from *Bayankhongor Aimag Atlas* 1989, 7, 14.

The majority of households that had herded the gegen's livestock (all told, about 300–350 hearths) were divided among four sum: Bogd (50 households), Jinst (200), Ulziit (50), and Erdenetsogt (50) (Simukov 1993, 52). These continued, in a modified form, the long migrations of the nomadic sheep and horse herders, wintering both south of Ikh Bogd Mountain and in the low Narin Khar Range to its north, then moving north in summer to the southern slopes of the Khangai Mountains along the Tuin River. Fall and spring were spent in intermediate pastures along the Tuin River, probably at desert springs and wetlands. Simukov noted a gradual decline in the number of households undertaking such long migrations.

A new development in the absence of the gegen was the establishment of a group of about eighty households migrating in the vicinity of Orog Nuur, terrain off limits in the gegen's time because it was reserved for the autumn animal census. These households came to spend the entire year in the vicinity of the lake, moving only short distances except in summer, when they might travel 20 kilometers north along the Tuin River to escape the dense infestations of insects around the lake (Simukov 1993).

Simukov identified two groups that used Ikh Bogd Mountain during this period. The first resembled the earlier Bogd cattle herders, for they herded primarily yaks on the upper reaches of Ikh Bogd's valleys and rarely left the mountain. The second spent part of the year in the lowlands near Orog Nuur or in other desert wetlands and at other times ranged through the lower reaches of the mountain valleys.

South of Ikh Bogd Mountain, in the vast expanse of the Gobi, Simukov found two herding groups. Wealthy herders migrated across a wide territory, from the southern border of the aimag to the south slopes of Ikh Bogd Mountain. A second group included poorer herders, who were not able to move far and so confined their movements to small areas around a few wells. The camel herders stopped migrating north as far as the monastery in summer, and their movements became indistinguishable from those of the Gobi sheep-and-goat herders who had never belonged to the monastery.

From these data, Simukov concluded that the long migrations of the highly mobile sheep and horse herders were not an economic or ecological necessity but, rather, a byproduct of the feudal system and the gegen's desire to control his subjects and the surplus they produced. Absent the ecclesiastical feudal system, they were doomed to disappear eventually, because other groups of herders used the same pastures year-round. He also found that, regardless of their patterns of pasture use, each group of herders resolutely believed its own methods and pastures to be the best, or at least best suited to its own needs (Simukov 1993).

THE COLLECTIVE PERIOD, 1960–1990

In the 1950s herding collectives gained momentum in Mongolia as the government learned to use taxation and social incentives to encourage participation. By 1958, 75 percent of all households in the nation had joined collectives, and by March of the next year 99.3 percent of households were collective members. Although a tiny

number of herders maintained their independence until the 1970s, essentially all herders were collective members by 1960, when collectives and districts were fused as territories and administrative-productive units (Rosenberg 1977, 34).

SOCIAL ORGANIZATION AND LABOR RELATIONS

Under the collectives, traditional social organization was disrupted and a new system imposed. The basic unit of production became the *suur*, one or two households camped together and responsible for herding a specific kind and class of livestock. This grouping replaced the traditional kin-based *khot ail*. *Suur* were organized into brigades, in some cases with an intermediate level of organization called a *khesig*. A collective or *negdel*, whose territory was identical to that of the sum and who shared one leader with the sum, usually consisted of four to seven herding brigades of 100–200 households each and an auxiliary brigade responsible for construction and maintenance tasks. Each *suur*, *khesig*, and brigade had a *darga*. *Negdel* herders were salaried, with benefits that included vacations. Productivity was promoted through reward and demerit incentives. Herders who failed to meet production targets made up the difference from their private livestock or directly from their salaries.

Schools and health clinics were established in the sum centers, settlements that housed the *negdel* administration and government workers. In addition to these basic social services, libraries, bakeries, hairdressers, shops, and social clubs were built in sum centers. Telephone service from Ulaanbaatar (the national capital) and aimag centers to the sum centers was established; and the postal service delivered mail and newspapers to brigade centers—and sometimes even to herding camps. School attendance was mandatory, and children of herders often boarded in dormitories in the sum center during the school year. In the 1940s, to speed the literacy campaign, the Cyrillic script was adapted to the Mongolian language, and by the 1970s a high rate of literacy was achieved.

CHANGES IN PASTORAL LAND USE AND PRODUCTION

Although the basic nomadic strategy of rotating among seasonal pastures was preserved under the collectives, the overall radius of movements decreased, confining herders to smaller areas and limiting access to the broad range of ecological zones and diverse forage resources traditionally used by many. Other features of the pastoral economy also changed significantly as the Soviet-influenced central government sought to forge a modern agricultural-industrial state from a nation of nomads. The major changes and some of their social and ecological implications include:

- Species specialization: *Negdel* herders were specialized in the species, sex, and age class of livestock they herded for the collective, although their small private herds allowed some diversity. Overall, fewer, larger, and more specialized herds used collective pasturelands, in the name of efficiency. Species specialization may have meant that utilization of forage was less efficient than that promoted by grazing diverse herds in a single pasture area and led to the over-



FIG. 5—A wooden “winter shelter” built in Jinst Sum during the collective era shelters newborn lambs. Most such shelters were acquired by individual herders during privatization and are now their private property. Other herders built their own shelters after privatization, using scavenged lumber. (Photograph by the author, February 1995)

use of pastures by large, single-species herds (Mearns 1993). Specialization may also have led to the loss of valuable knowledge about the variety of animals once herded and their particular needs and uses (Sokolewicz 1982). Several herders I interviewed shared these views. Caroline Humphrey disagrees, saying that knowledge remained intact among older herders and that, in any case, most collective herders owned diverse, if small, herds of private stock, enabling them to preserve knowledge and skills related to all five types of traditionally herded livestock (1978).

- Winter shelters: A campaign to construct roofed wooden shelters to protect livestock from the elements during the severe winter and spring months started in the 1940s and was pursued through the collective period (Figure 5). Although the wooden shelters probably did improve the survival of the livestock, when improperly cared for and cleaned they were also potential breeding grounds for disease. The construction of large, permanent shelters influenced herders to return to the same winter and spring locations every year, rather than varying their campsites, and made rights to winter campsites increasingly resemble private property—a process that Bawden (1968) and Natsagdorj (1963) noted beginning in the nineteenth century. Herders were instructed to “make full use of” *negdel* property, including winter shelters,

fences, and wells, and those who refused to adopt these technologies were punished (Duul Negdel Internal Regulations 1990).

- Otor: These rapid, short- or long-distance movements of livestock with a small tent or traditional Mongolian *ger* (round, felt-covered dwelling) involved only a few members of a household (Bawden 1968; Batnasan 1972). Otor was undertaken in a variety of circumstances, including fattening stock in the summer and autumn, taking them to salt licks, and avoiding drought and deep snow. Under the collective system otor was heavily promoted as a herd- and pasture-management strategy. It had the advantage of making certain that livestock were well distributed across the landscape, while encouraging settlement of the main household. Mandatory otor was a source of conflict between those herders who did not want to go and the administrators of the collective, and herders who did not do otor were criticized in public meetings (Humphrey 1978). Jeremy Swift reports that in the late 1980s young herders often looked forward to summer otor to escape the watchful eyes of their parents (Swift 1999).
- Water supply: A large number of wells serviced by mechanical (rotary) or motorized (coal- and diesel-fired) pumps were developed during the collective period, and in some areas water tanks for domestic and livestock use were trucked to remote pastures. Improvements in the supply of water facilitated, in turn, the improved distribution of livestock across the landscape. But large-scale relocations of herders and stock to Dornod Aimag, in eastern Mongolia, and to other underused areas were unsuccessful.
- Transportation: Collectives provided transportation, usually in the form of trucks, for moving households between campsites. Livestock, except, perhaps, very young lambs and calves, were trekked on foot. The provision of transportation was critical to many households, which would otherwise have had difficulty moving to adequate pastures. Although some herders—for example, camel herders—continued to use their own, or the collective's, livestock for transport, most relied on the collective to provide trucks.
- Land allocation and tenure: The MPR Land Use Law of 1971 specified the formal tenurial relationships on which land use in Mongolia was based during the collective era. Under this law all land was state land, to be granted for free and perpetual use to agricultural cooperatives, collectives, and citizens of the MPR. Land granted by the state to the collectives was then allocated within the collectives at the discretion of local leaders. New or changed administrative-territorial boundaries had to be approved by the Presidium of the People's Ikh Khural, Mongolia's legislative body. Land granted for interfarm or collective use was to be clearly defined by boundary markers. This category of land included interaimag state reserve pastures for emergency use and cattle-trekking routes, or stock driveways, as well as land used by the state fodder fund for cutting hay and cultivation. Use of these lands for other than their designated purposes was prohibited. In practice, local leaders often negotiated

directly with each other to gain reciprocal pasture-use privileges in case of disaster. These exchanges were then approved by the next-highest level of authority, the sum (for a brigade) or the aimag (for a sum). Land disputes within a territorial unit were settled at the next-highest level of organization by the executive administration of the *khural* (council) of people's deputies at that level. Disputes between herders of one brigade would be settled by the brigade *khural*; between those of one sum, at the aimag *khural* (Butler 1982).

At the level of the collective, negdel and brigade leaders, in consultation with collective livestock professionals (zootechnics) and herders, decided on annual migration routes. Herders' freedom to decide when and where to move varied considerably. It is clear, however, that the collective administration had the ultimate authority to make and enforce decisions. Collective regulations also provided specific penalties for the improper use of pastures. For example, the Duul Negdel in Jinst Sum had regulations that read, "If livestock do not go to otor, it is forbidden to graze the winter or spring pasture of others." Herders who violated the rule were subject to a 30 percent pay cut. Robin Mearns suggests that these "competing truths" about how decisions were made led inevitably to the weakening of customary mechanisms for allocating pasture (1993). He further argues that the negdel's intervention at all levels of pastoral production, including such tasks as transportation, shearing, and making felt, undermined the basis for group decision making about pasture use by eliminating other opportunities for cooperation within local communities (1996).

- Scientific management and professionalization of husbandry: The formalization of traditional knowledge about livestock husbandry began in the nineteenth century with the writings of the Mongol noble To-van. In 1945 future Mongolian President Jamsrangiin Sambuu published his well-known book, *Advice to Herdsmen*. The Mongolian Academy of Sciences began to take shape in the 1920s, but it was not until the collective period that applied research in animal husbandry flourished and widespread training of veterinarians and livestock paraprofessionals was undertaken. Most research focused on the selective breeding of livestock, on animal nutrition, on the development of standards of quality for livestock products, on fodder crops and methods for increasing hay yields, or on the prevention and treatment of livestock disease. Attention to rangeland ecology and management was conspicuously absent until much later, perhaps because the government largely appreciated the accumulated wisdom of herders' traditional knowledge in these areas and thus did not feel that they warranted the same level of investment in scientific research. The main drawbacks of the increased professionalization of livestock husbandry were the loss of traditional knowledge and skills, especially traditional veterinary knowledge, and the change in traditional values and cultural symbols and practices with respect to livestock, which were increasingly viewed as a means to an end rather than as an end in themselves.

- Veterinary services: Vaccinations, dipping for ectoparasites, and other veterinary practices succeeded in eradicating or controlling most of the major livestock epizootics in Mongolia (Edström 1993). Despite these improvements in animal health, the overall livestock population at the national level has remained fairly stable for the last forty years.
- Hay and fodder production and the state emergency fodder fund: To offset reduced pasture resources and to combat losses from climatic disasters, collectives and the state increased the cultivation of fodder crops, the harvest of wild hay, and the production of concentrated feed. At the collective level, herders were encouraged and sometimes required to cut a designated amount of hay for use in winter and spring. In 1971 the state established an emergency fodder fund that stored feed at regional centers and distributed it when disasters occurred. Collectives paid the cost of feed at the point of origin, and the state covered the cost of transportation (Swift 1995). Originally intended to reduce livestock losses owing to severe blizzards or other occasional but serious conditions, the fodder fund came to have a more flexible use, bridging annual shortfalls in the quality and quantity of forage through the late winter and spring. Guy Templer, Jeremy Swift, and Polly Payne contend that this abuse of the fund led to locally unsustainable stocking rates in some regions, which were then effectively subsidized by fodder grown and transported from other parts of the country (1993). Such use of the fund's reserves may have increased the number of cattle in the Gobi, where the natural forage base was not entirely suited to cattle.
- Livestock insurance: All collective-owned livestock came under the coverage of a state insurance company. Insurance covered losses, such as deaths from natural disasters, that did not result from herders' negligence. Losses from predation and accidents usually were not covered by insurance and were the responsibility of the herder. Disease-related deaths were indemnified by the state, via the collective. The livestock-insurance program during the collective period was so successful that it was used to subsidize crop insurance (Swift 1995). However, few privately owned livestock were covered.
- Sedentarization: The collectives made up for reducing the area for nomadic migrations and for decreasing the diversity of pasture resources available to a sum's herders by improving the spatial distribution of livestock. This was done by improving the supply of water, by providing transportation, by encouraging otors, and by enforcing movements. Nonetheless, the tacit policy of the socialist regime was sedentarization. The collectivization of livestock production and the establishment of sum centers were a piece of this process. The concurrent increased interest and investment in the scientific management of livestock husbandry was due at least in part to its prospective role in transforming the extensive, nomadic pastoral economy into an intensive, sedentary one (Rosenberg 1977).

Seasonal movement patterns in Jinst and Bayan-Ovoo Sum changed after the formation of collectives (Figure 6). Movement was confined almost exclusively to the area within each brigade's territory. A large number of winter shelters were constructed, and mechanically pumped wells were built. A few herders still undertook long otter migrations at the behest of collective authorities. Sheep herders from Jinst regularly summered high in the Khangai, and a select group of herders from Bayan-Ovoo were sent annually to an adjacent sum in Arkhangai Aimag. Camel herders in Jinst Sum often spent the entire year at one well and did not migrate at all. Cross-border agreements were made between sum and aimag in the event of droughts or dzuud.

JINST SUM AND BAYAN-OVOO SUM, 1994-1995

Privatization has had several direct effects on local property relations in Jinst and Bayan-Ovoo (Figures 7 and 8). First, livestock shelters and corrals have been privatized, fostering the individual ownership of property by herders. The land on which shelters stand is still state property but is leased to local herders. Ownership of a shelter strengthens claims to campsites and surrounding pastures. Second, herders claim multiple and often indirect sources of rights to pasture. Poor herders and herders who have recently acquired livestock rely on relationships with distant kin or acquaintances for access to campsites and pasture. Third, formal institutions that had regulated pasture use and pasture allocation were lost with the dismantling of collectives. Fourth, the weakening of customary regulatory institutions during the collective period left communities without strong informal institutions of allocation or enforcement. Changes in herders' economic well-being and pastoral tenure are reflected in changing patterns of pastoral land use, including increasing out-of-season grazing of reserve pastures and year-round grazing of key resources previously used in only one or two seasons; concentrations of livestock near roads and towns; high rates of trespassing; and overall declines in mobility. In 1994 the Ikh Khural passed a land-use law that provided for the leasing of pastureland to individuals and groups of herders. This was to be accomplished in accordance with traditional seasonal patterns of movements. Implementation of leasing provisions began in 1998, but interpretation of the law varied widely among local administrators and ministry officials and from one sum to another. Amendments to the law were under consideration by the Parliament in the summer of 1999.

IMPLICATIONS

This historical-geographical review and its embedded case study suggest how once-elaborate herding patterns and practices have changed incrementally over time, transforming once truly nomadic Mongol tribes into a seminomadic population of extensive livestock herders. A number of themes emerge. First, generalizations about pastoral land-use patterns were no more applicable to the entire territory of Mongolia 150 years ago than they are today. Tenure institutions and patterns of mobility varied as drastically with climate, ecology, and geography as with local political and economic conditions. Second, although widespread in the collective era,

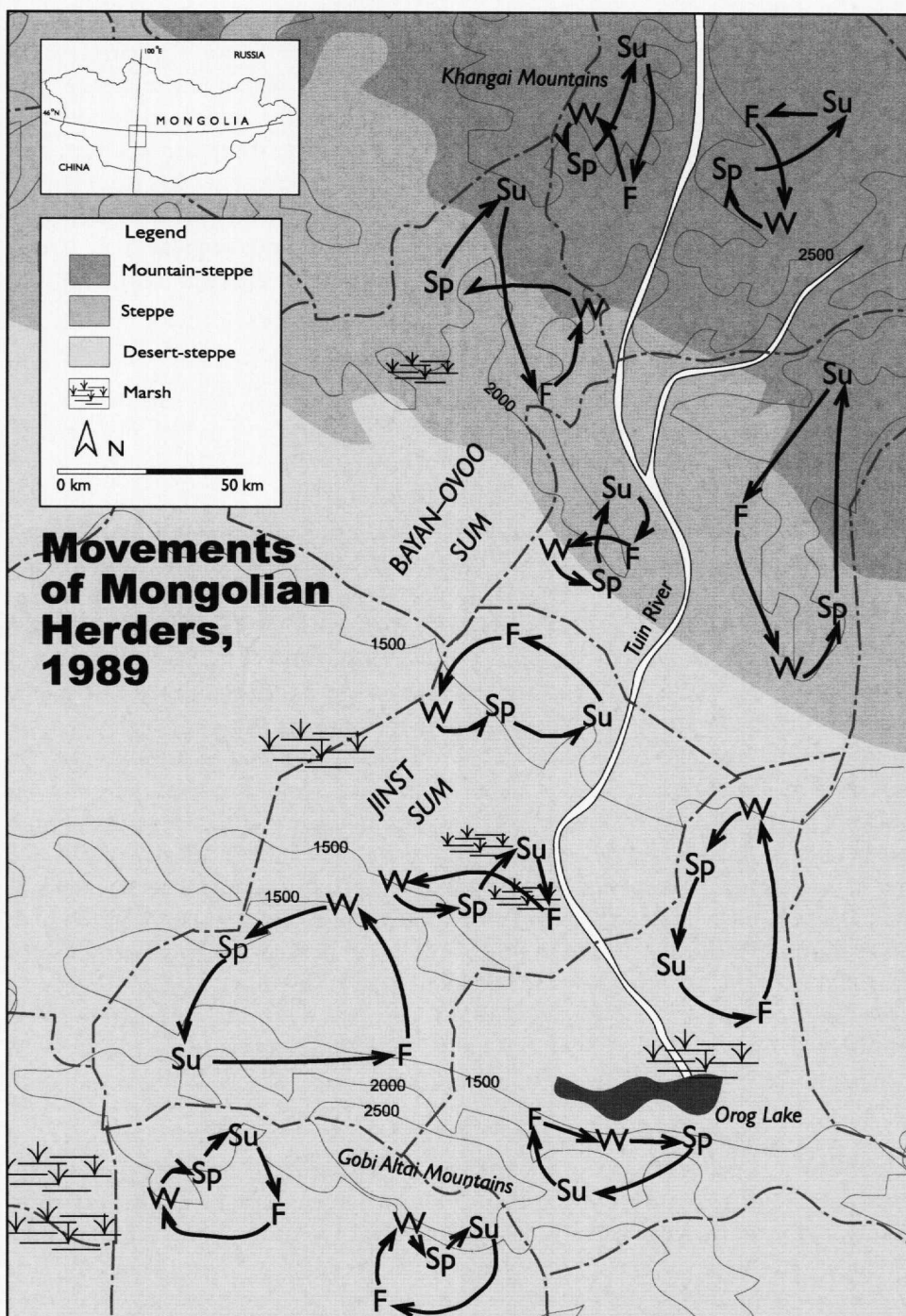


FIG. 6—Seasonal movement patterns of herders in Jinst Sum and Bayan-Ovoo Sum and neighboring districts of Mongolia in 1989. *Source:* Adapted from Bazargur, Chinbat, and Shirevadja 1989, 50.

herding practices such as specialization of herds, otor, and building permanent winter shelters were well under way at least fifty years prior to collectivization, and decades before the revolution. Third, although there are no spatially explicit records to allow us to calculate the fluctuations in livestock populations in the study area since prerevolutionary times, it is clear that the patterns of spatial and temporal distribution of livestock have been transformed over time and terrain by changing administrative boundaries, regulatory institutions, and tenure regimes. As nutag shrank in size, boxed in by increasingly confining administrative boundaries, herders lost access to the diverse habitats and resources that they once relied on. Fourth, despite these alterations in land-use patterns, the state and other governing institutions consistently have met the challenge of extreme environmental variability by developing institutions that favor flexibility in nomadic movements and facilitate the ecologically rational distribution of livestock in the landscape. Fifth, throughout much of Mongolia's history, differences in the wealth of herding households have affected access to livestock and transportation, in turn influencing herders' mobility, access to pasture and water, and thus the means to increase their herds. Sixth, in many locations formal and informal regulation of land use, particularly of nomadic movements, determined the timing and location of grazing, thereby constituting a *de facto* system of land tenure. Finally, despite variable tenure regimes and regulatory institutions for pasture use in precollective Mongolia, regulation by both formal and informal institutions was common, often framed with a strong formal authority.

All of these themes were relevant in Mongolia in 1999, but three in particular deserve further comment: the loss of access to diverse habitats due to shrinking migratory territories; the relationship among poverty, mobility, and resource use; and the roles of formal and informal institutions in regulating seasonal movements.

The transition from the prerevolutionary political administration to the socialist regime dramatically shifted the physical boundaries of administrative territories. Herders' seasonal migratory territories diminished in area, cutting them off from traditional seasonal pastures and often confining migrations to a single ecological zone. Scholars from Mongolia's Institute of Geography have advanced the "ecologically appropriate region" as the basis for a new spatial and social organization of pastoralism in modern Mongolia (Bazargur, Shirevadja, and Chinbat 1993; Batbuyan 1996). In this approach, the unique movement patterns of each nomadic community should be studied and administrative divisions formed to encompass the full range of ecological resources needed to support the livestock species grazed by the community, rather than arbitrarily dividing the landscape into administrative units. Somewhat to my surprise, in 1994–1995 I found support among some local government officials in Jinst and Bayan-Ovoo for this concept, although they believed that revision of administrative boundaries was politically unlikely. In 1999, sum in Bayankhongor Aimag were actively pursuing "reunification" into khoshuun.

A second important issue is the complex historical interrelationship among wealth and poverty, access to transportation and pasture resources, and mobility of

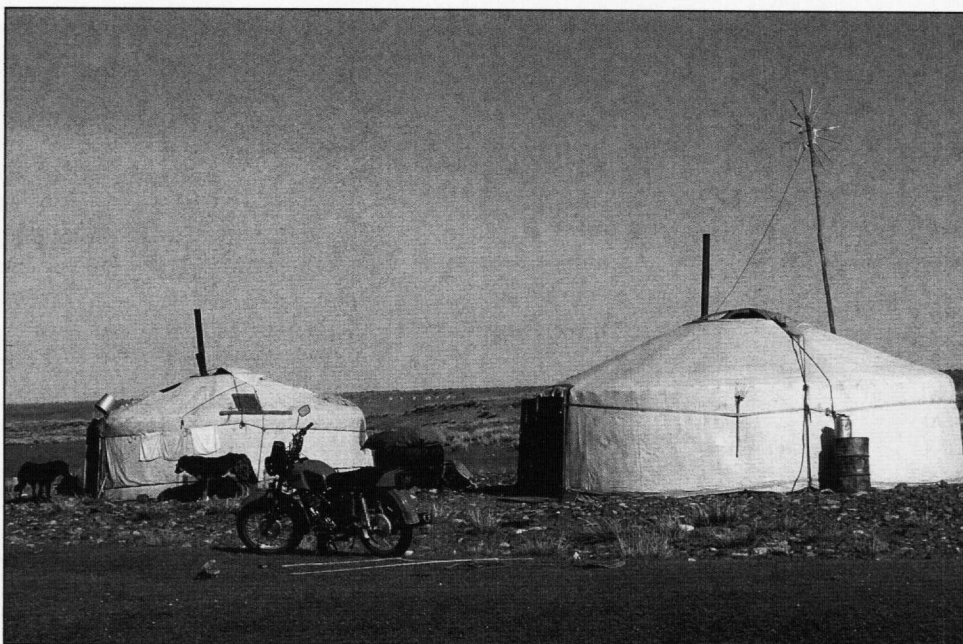


FIG. 7—At the dawn of the market economy, a well-to-do herding household in Jinst Sum is identified by the new Russian motorcycle parked out front, the home-made television antenna, and the clean white canvas covering on its traditional dwelling. (Photograph by the author, June 1994)

herders and herds. The most pressing problem for herders is access to sufficient pasture and water to sustain their herds. In Mongolia's spatially and temporally variable environment, access depends on an ability to move to resources as they become available seasonally and interannually. In a pastoral society poverty is defined, at the most basic level, by the number of livestock a herder possesses. The number of livestock, in turn, determines both the demand for pasture and the herder's ability to obtain it. Quite simply, poor herders lack the pack stock to make nomadic moves and lack surplus products or livestock to trade for assistance in moving. Having few livestock makes a herder poorer, and the lack of mobility creates further destitution, precluding the herder from gaining access to good forage and water, and thus the best opportunities for herd growth. In the past, Mongol social organization provided various forms of assistance to the poor, ranging from informal mutual assistance through the *khot ail*, to the possibility of joining a monastery, to the administrative responsibility for the poor by *khoshuun* nobles and administration, to the social-welfare system of the collective era.

My research in Bayankhongor Aimag in 1994–1995 indicated that poverty is strongly linked to declining nomadic mobility and linked indirectly to out-of-season grazing and trespassing. The poor are less likely to own winter or spring shelters for their animals, and they frequently depend on associations with distant kin or acquaintances to claim rights to essential pasture resources. Yet weaker claims and



FIG. 8—An early spring storm forces a Bayan-Ovoo Sum khot ail camped in the mountain-steppe to move over a pass into a neighboring district. These households have been able to hire a truck to move their belongings, while the young men and older children in the khot ail trail the herds of cattle and small stock on horseback to their new pastures. (Photograph by the author, April 1995)

shorter moves are linked to high rates of trespassing and out-of-season grazing of reserve pastures. In addressing current unsustainable grazing patterns, policymakers must heed the multiple ways in which wealth and poverty affect pastoral resource use and must consider how to help herders overcome material as well as social constraints on mobility.

Finally, this historical analysis points to interactions among control of pasture use, rights to pasture, and regulation of seasonal movements. The regulation of movement, routine in at least some khoshuun and operating at smaller scales in many areas, served as an effective means of controlling pasture use and preventing out-of-season grazing and other ecologically and socially inappropriate uses of resources. Although pasture-allocation practices existed, as did formal prohibitions of certain activities, formal and customary enforcement of seasonal movement patterns were an effective and widespread means of preventing the misuse of resources and of providing herders with security in their rights to key resources such as winter pastures.

In Bayankhongor Aimag neither formal nor informal regulatory institutions were functioning successfully in 1994–1995. Any formal regulatory structure essentially evaporated with the dismantling of collectives, and local officials were called on only to mediate the most extreme disputes. Important norms of pasture use, such

as reserving winter and spring pastures, were still given lip service by most herders, but they were also frequently violated, in particular due to constraints on mobility.

The lack of strong formal or informal institutions to regulate seasonal movements and coordinate the expectations of herders as to one another's behavior was fostering a vicious cycle of declining mobility and increasing out-of-season grazing and trespassing. The larger lesson offered here is that formalizing tenure through land titling or leasing is not the sole solution to such unsustainable current trends in grazing patterns. Rather, a solution may lie in a combination of formal and informal regulatory institutions that coordinate seasonal movements, creating shared expectations for behavior and security of access to resources through a *de facto*, rather than an official, tenure system. Such dual regulatory institutions, consisting of formal governing entities that enforced large-scale movements in tandem with local custom and informal sanctions that determined rights to specific pastures and camps, may help explain the apparent legacy of sustainability on the Mongolian steppes.

NOTE

1. When the Qing Dynasty (Manchu rule) collapsed in 1911, Mongolia gained autonomy and became a theocratic state headed by the reincarnation of the Jebtsamdamba Khutukhtu. In practice, the social and economic structures of the country remained much as the same as they had been during the Manchu reign, with the exception that near-absolute authority was restored to hereditary princes. The dual social hierarchies and bureaucracy established under Manchu rule persisted, and patterns of land use were continuous from the Manchu period.

2. Mongols use the category "cattle" to refer to both European cattle (*Bos taurus*) and domesticated yaks (*Bos grunniens*).

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