

# PASTORAL PRODUCTION

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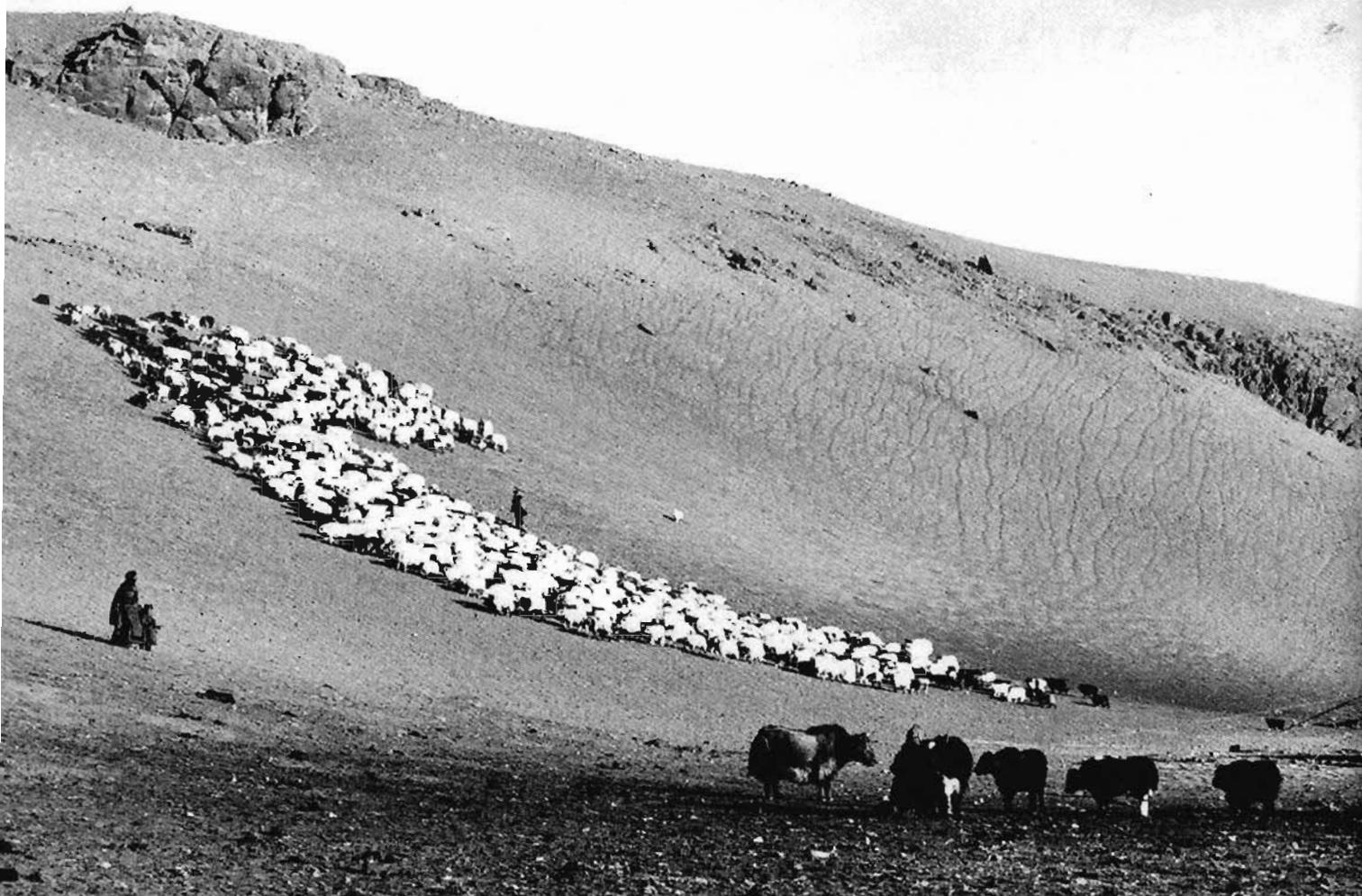


**Tibetan stirrups and saddle  
carpet, Zhongdian, Yunnan, China,  
1996**

**W**hen analysing rangeland ecology and current pastoral production practices on the Tibetan rangelands, it is important to keep in mind the region's long pastoral history. The movements of early hunters, herders, traders, and troops across the grazing lands had an important impact on the later historical development of dynasties and kingdoms throughout the region. They, in turn, affected how pastoral areas were used. Understanding the historical developments that took place in the grasslands is invaluable for comprehending the present ecology of the landscape. It also helps to inculcate a greater appreciation for present day nomads and their long experience with herding livestock across these vast fields of grass.



Horse races, Namdo, Doko, Nepal, 1978



**Nomad camp, northeast of Rongma, Chang Tang Wildlife Reserve, Tibet, China, 1993**

**N**omads have been herding livestock on the grazing lands of the Tibetan Plateau for probably 4,000 years. As early as the Chinese Hsia dynasty (2205-1766 BC), nomadic tribes called the Qiang, who were believed to be the early ancestors of Tibetans, were known for making a fine woven woollen material in their camps in the Kunlun Mountains in the northeastern part of the Tibetan Plateau. Even rugs made from the 'hair of animals' were recorded as one of the articles of tribute received by the Hsia Emperor from these early nomads. During the Chinese Shang dynasty (1766-1027 BC), these nomad tribes inhabiting the eastern Tibetan Plateau grasslands were also renowned for their horses and were known as the 'Qiang of Many Horses'. Throughout the Shang and Zhou (1027-256 BC), the Qiang were a powerful force in the grasslands and often plundered Chinese agricultural settlements. These barbarians from the grasslands kept Chinese military forces on constant alert.

The consolidation of power among the Qiang tribes in the period between the Han (206 BC - 220 AD) and Tang (618-907 AD) dynasties led to the formation of kingdoms of considerable size in the eastern Tibetan grasslands. One of these was the legendary Women's Kingdom located in the mountains south of the headwaters of the Yellow River. During the Sixteen Kingdoms' period (301-439 AD), a number of Tibetan dynasties controlled much of Western China and the Silk Route for long periods of time. During the reign of the Tibetan King, Songsten Gampo (602-650 AD), the Tibetan Empire really emerged as a force to be reckoned with in Central Asia. By the eighth century, Tibetan territory included vast domains and, at one time, controlled most of the Silk Route. In 763, Tibetan troops even captured and briefly held the Chinese Tang dynasty capital at Chang-an (modern day Xian). Tibet's control of Central Asia and monopoly of the principal trade routes lasted well into the ninth century.

**Milking sheep, Phala, Tibet, China, 1997 [chapter photo]**



**Female yak, above Thimphu, Bhutan, 1986**



**Nomad lady bundled up while herding, south of Shuanghu, Tibet, China, 1993**



**Nomad camp and yaks, Sol, Bhutan, 1987**

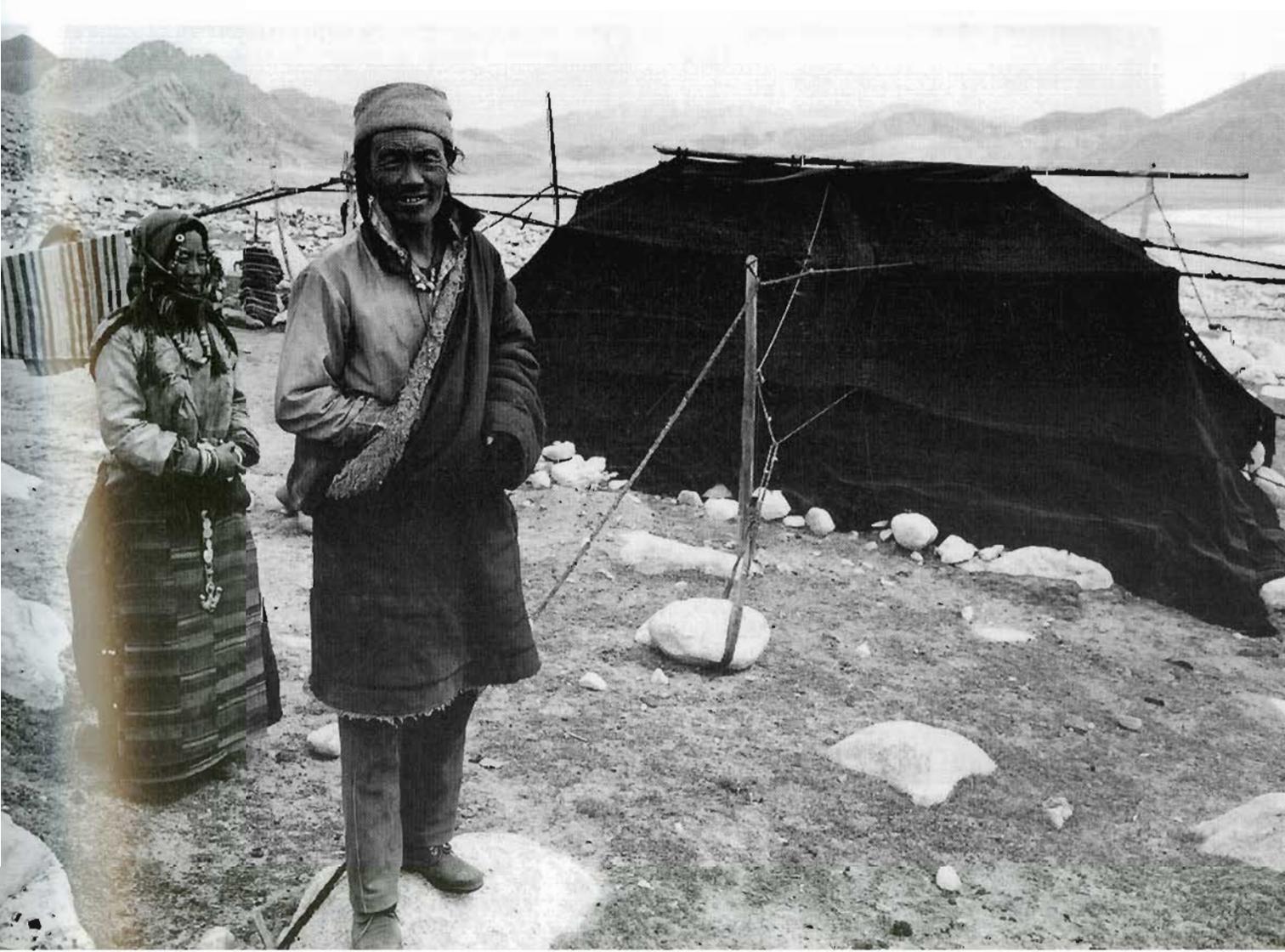
**T**he fact that nomads still populate Tibetan grazing lands today is proof of the rationality and efficacy of many aspects of traditional pastoral production as a means of converting forage from cold, arid rangelands into valuable animal products in an environment where cultivated agriculture is not possible. The survival of pastoral nomads indicates that many of the strategies of animal husbandry and range management developed centuries ago are well-adapted responses to the spectrum of environmental conditions found on the Tibetan steppes. Over thousands of years, nomads accommodated to their environment, learning to live with what it offered instead of changing and moulding the landscape to suit their needs, as farmers are wont to do. The endurance of pastoralism on the Tibetan Plateau also provides examples of nomadic practices that were once common throughout the pastoral world but are now increasingly hard to find. Tibetan pastoralists offer an opportunity to learn more about a way of life that is fast vanishing from the earth.





Pastoral production strategies and practices vary widely across the rangelands, depending on altitude, environmental conditions, and rangeland types and, in recent years, on the influence of pastoral development policies, development interventions, and new markets for livestock and livestock products. Pastoralism in this environment has evolved through long-term persistence in one of the most inhospitable places on earth. As such, nomads have adjusted their production strategies to best suit the local environment and to take comparative advantage of the opportunities that are presented.

The indigenous, or traditional, pastoral production systems that operated across most of the Tibetan Plateau were an evolutionary adaptation by Tibetan nomads. The livestock production practices that developed were rational, aggregate behavioural responses by Tibetan nomads to the resources and risks of the environment. Since they still operate, many aspects of the traditional Tibetan pastoral production system have proved to be successful over the centuries. As such, there is a lot of value in many aspects of traditional pastoral production systems.





**Nomad camp near Madoi, Qinghai, China, 1988**





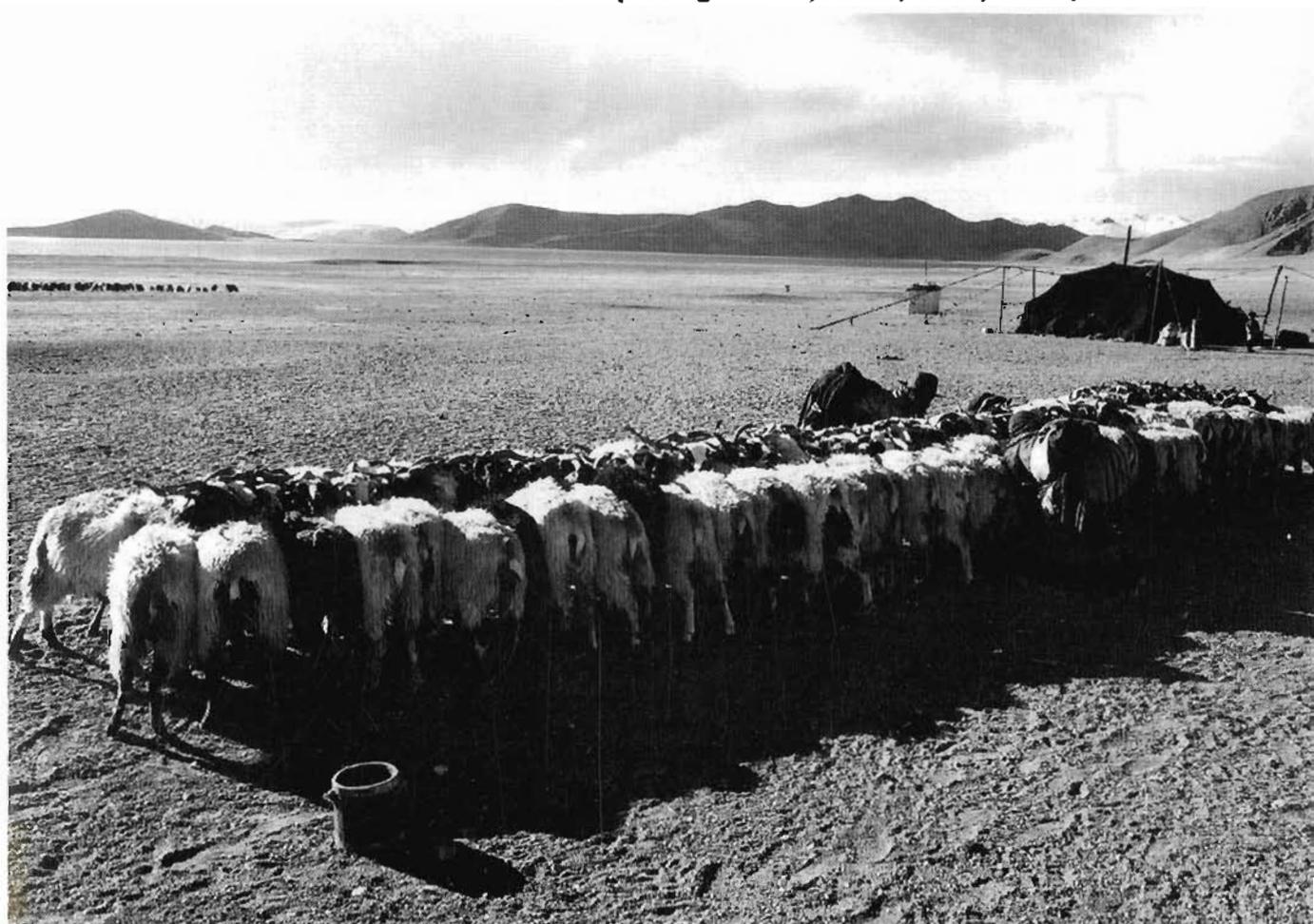
**Nomad woman, Phala, Tibet, China, 1997**

**Yak herd moving, Phala, Tibet, China, 1997**



**N**omads on the Tibetan Plateau often raise a mix of different animal species. Each species has its own specific characteristics and adaptations to the grazing environment. The multi-species' grazing system – the raising of yaks, sheep, goats, and horses together, commonly practised by Tibetan nomads - maximises the use of rangeland resources. Different species of animals graze on different plants and, when herded together on the same range, make more efficient use of rangeland vegetation than a single species. Maintaining diverse herd compositions is also a strategy employed by herders to minimise the risk of losses. In the harsh environment in which pastoralism is practised, livestock are the only means by which people can subsist. Heavy snowstorms or outbreaks of livestock disease can devastate herds. Maintaining a mix of different species of animals provides some insurance for nomads that not all animals will be lost and herds can be rebuilt again. Different types of animals also have varied uses and provide different products for home consumption or for sale.

**Sheep being milked, Phala, Tibet, China, 1997**

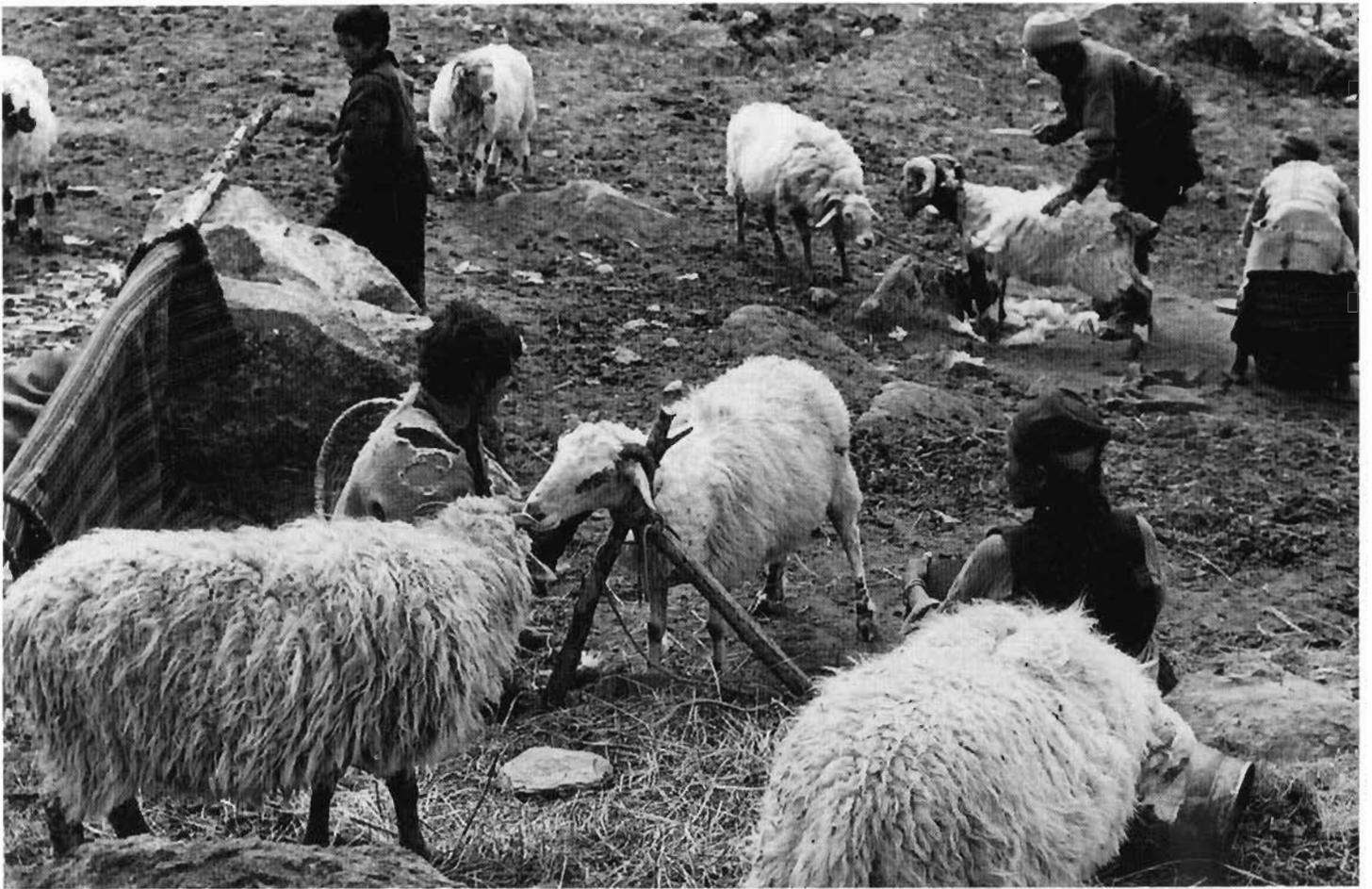




**Milking goats, Chang Tang Wildlife Reserve, Tibet, China, 1993**

The composition of livestock species within Tibetan nomads' herds, and the number of animals individual nomad families raise, varies considerably across the rangelands of the Tibetan Plateau. For example, in western Tibet, where it is drier, sheep and goats are more common than yaks; in the east, where rainfall is greater and vegetation is lush, yaks are the most important animals raised. In Naqu Prefecture of the Tibetan Autonomous Region, in the counties of Shuanghu and Nyima, sheep make up 65 per cent of the total livestock numbers; goats comprise 30 per cent, and yaks and horses only four and one per cent, respectively. In Naqu County, sheep make up 56 per cent of the total livestock; goats comprise 15 per cent; yaks 26 per cent; and horses only total about one per cent. In Jiali County of Naqu Prefecture, sheep only make up about 35 per cent of all livestock while yaks make up over 53 per cent of the total livestock. Much further to the east, in Hongyuan County of northwestern Sichuan Province, sheep and goats combined only make up nine per cent of the total livestock, while yaks comprise over 85 per cent of all animals. In Hongyuan, horses are also more important and make up about five per cent of all livestock.

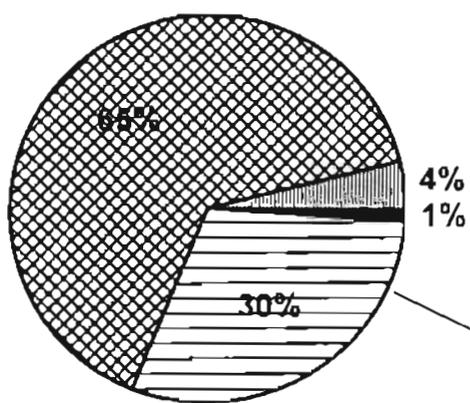
In terms of numbers of animals, typical (not rich, not poor) nomad families in Shuanghu and Nyima Counties maintain, on average, about 250 sheep, 100 goats, 15 yaks, and two to three horses per family. In Naqu County, a typical nomad family of five to six persons would have about 60-80 sheep and goats, 30-35 yaks, and two to three horses. A rich household in Naqu may have perhaps 200 sheep and goats and 100 yaks. In Hongyuan County, a typical family would have 80-100 yaks, five horses, and probably no, or only a few, sheep. For a family in Hongyuan with a total of 100 yaks, only about 30-40 of the yaks would be milch animals, however. In the nomad region of Phala, in the remote northwestern Shigatse Prefecture of Tibet, the richest nomad family in the area had 286 sheep, 250 goats, 77 yaks, and eight horses; a total of 621 animals. With six people in the family, this amounted to 103 animals per person. Their total income from the sale of livestock and livestock products in one year amounted to about US\$ 1,000, with sheep providing about 60 per cent of this and goats about 35 per cent.



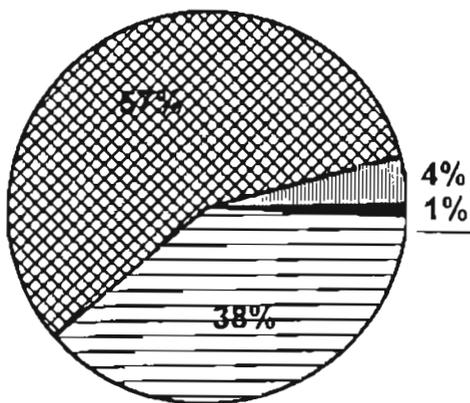
**Shearing wool from sheep, Langtang, Nepal, 1977**



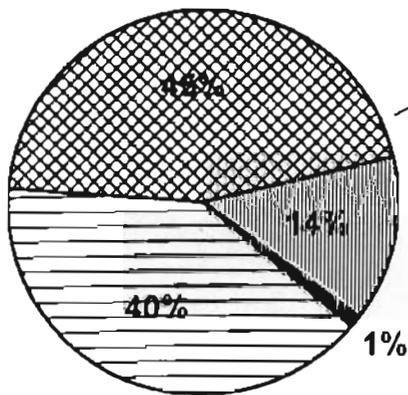
**Yak herder with  
butter churn,  
Langtang, Nepal,  
1977**



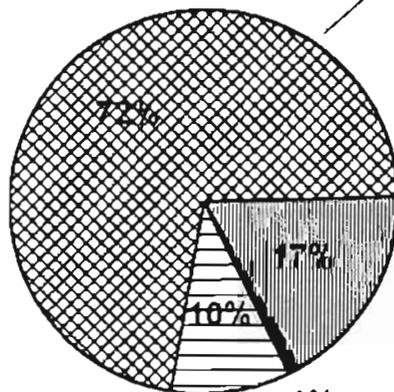
Shuanghu



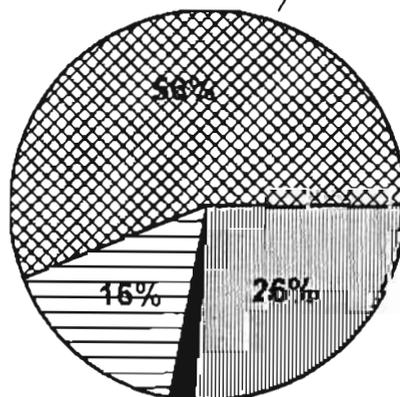
Nyima



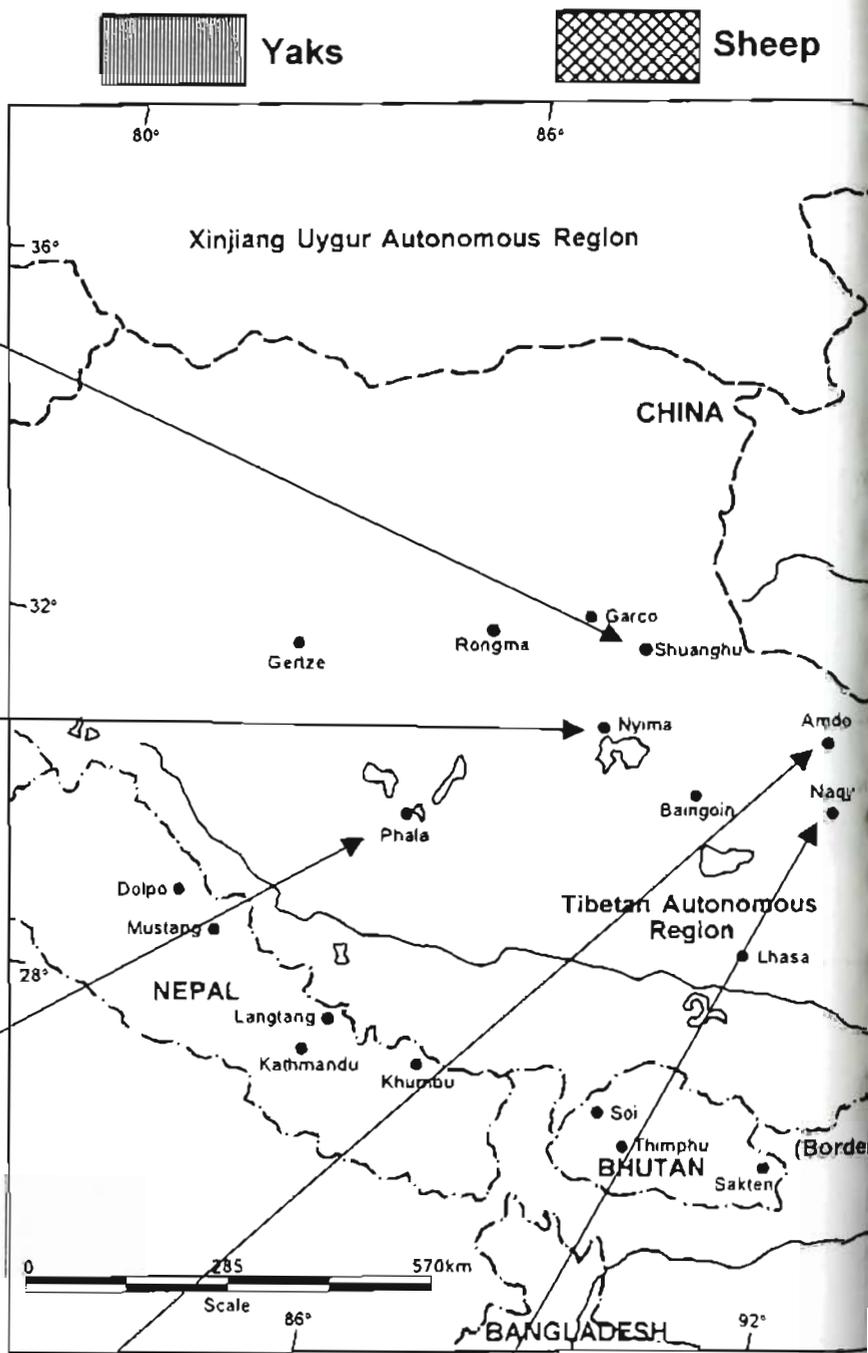
Phala\*



Amdo



Naqu



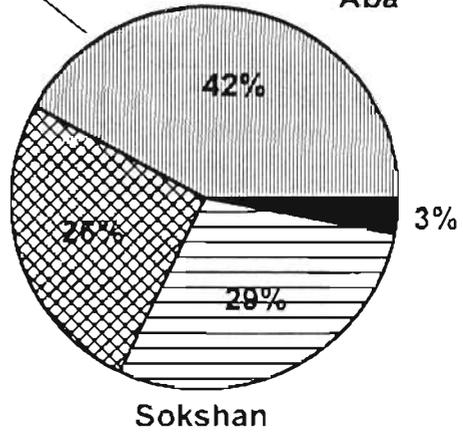
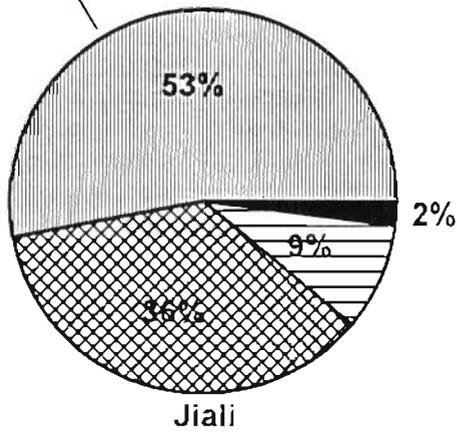
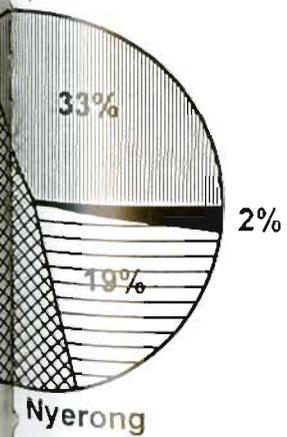
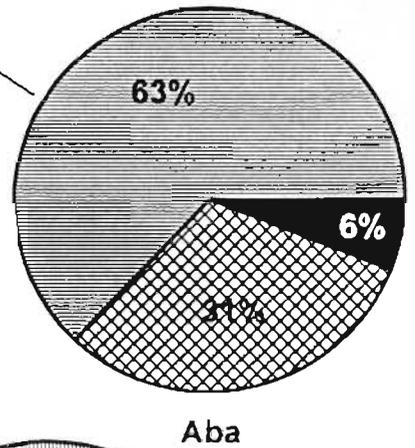
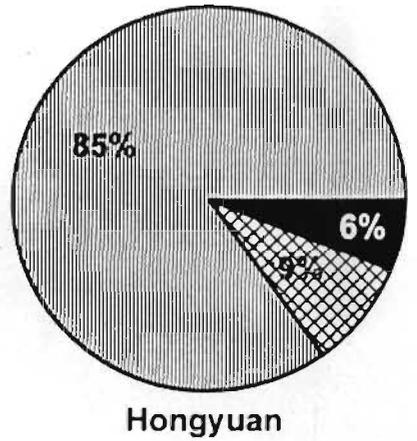
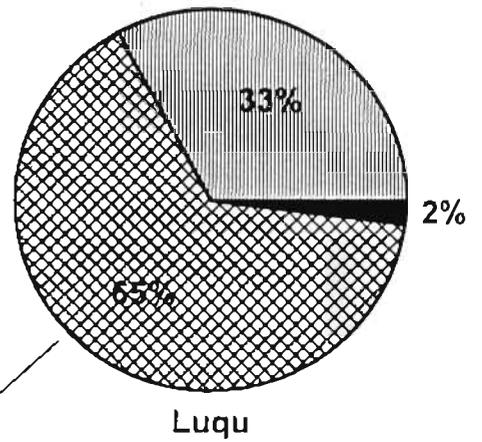
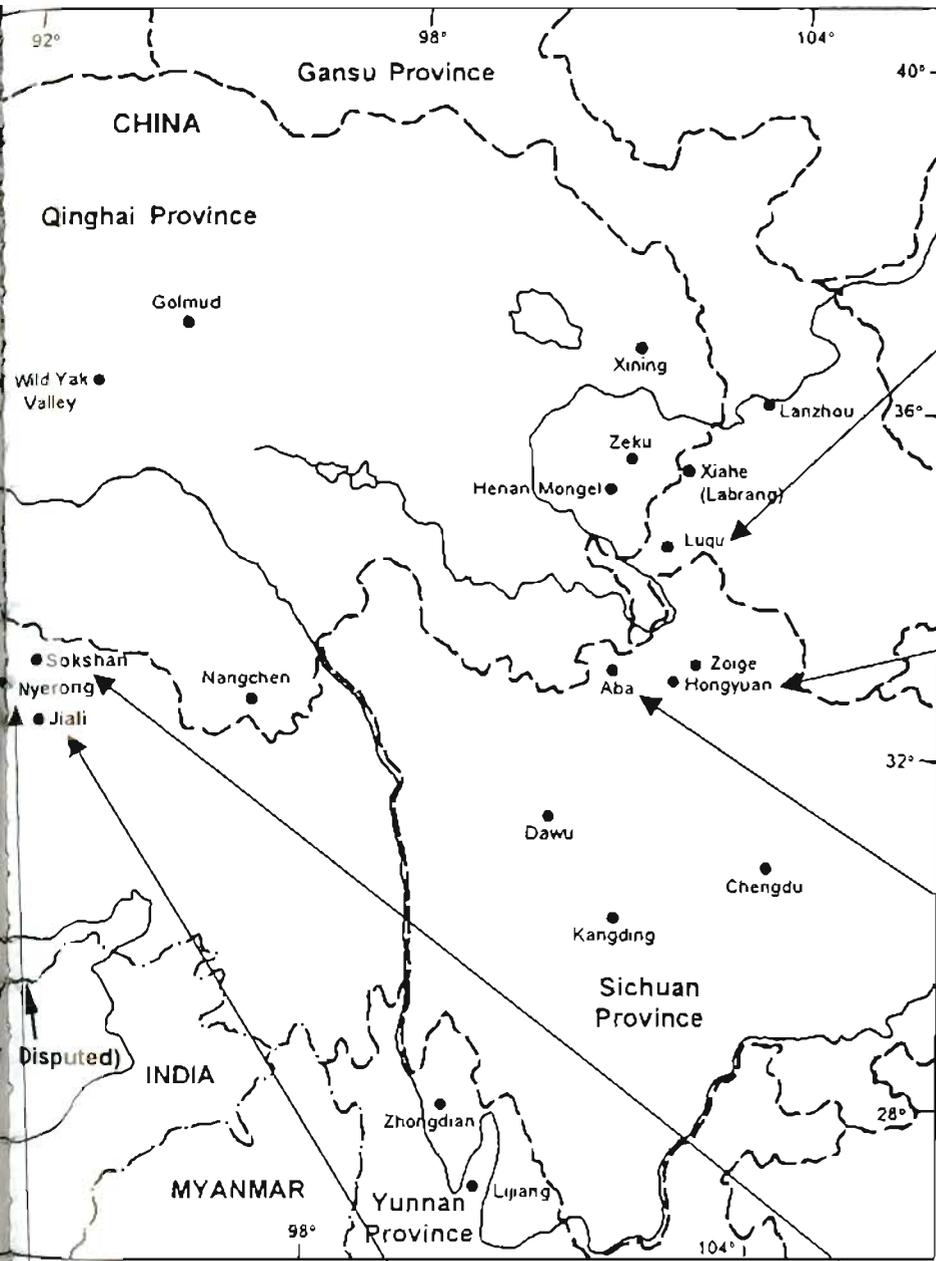
Map and figures of herd compositions



Goats



Horses





**Nomad moving to summer camp, Aba, Sichuan, China, 1998**

**I**n terms of livestock species' mix and herd structure, the herd design of Tibetan pastoral systems is not haphazard but, instead, shows sophisticated adaptive responses by Tibetan nomads to the environment in which they live and the resources available to them and their animals. The proportions of different livestock species vary regionally across the Tibetan Plateau, generally according to rangeland factors and the suitability of the landscape for different animals. Herd compositions within a geographic area can also vary with the skills, preferences, and availability of labour of the nomads. The rationality for the traditional structure of Tibetan nomads' herds was usually unacknowledged by early livestock and pastoral development specialists working in Tibet who came and advocated 'scientific' animal husbandry. Unfortunately, the utility and productiveness of nomads' herd structures are still often unappreciated.



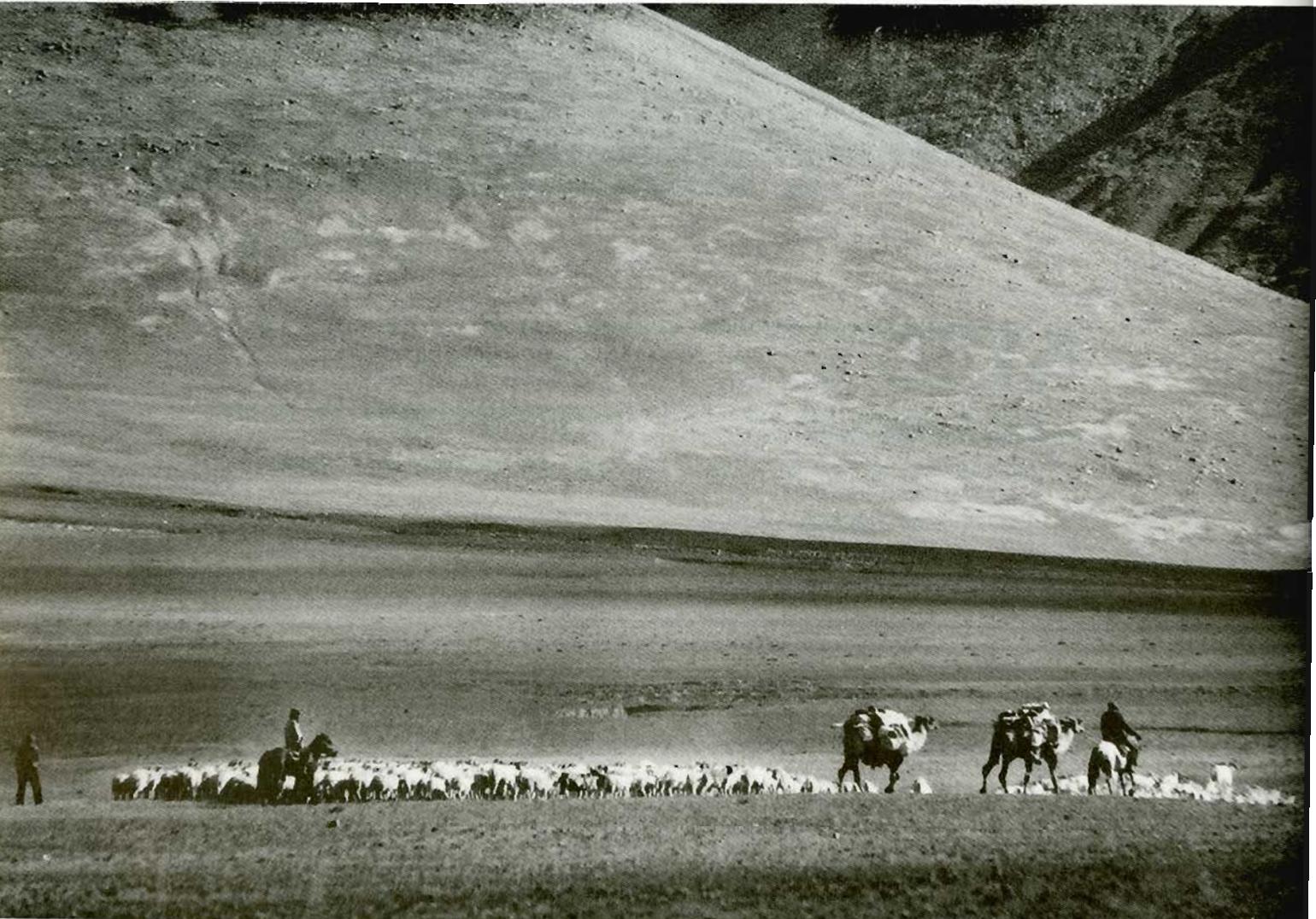
**Yak herd on the move, Malwa, Sichuan, China, 1996**

**M**obility is an important feature of pastoralism on the Tibetan Plateau. Traditional pastoral management systems were designed around the movement of herds to various pastures during different seasons of the year and the tracking of favourable forage conditions. Livestock are regularly moved between pastures to maintain rangeland condition and animal productivity. Herders do not randomly move across the landscape; rather, their movements are often well prescribed by complex social organizations and are highly regulated. Rotation of livestock between different ranges helps to conserve the grass and takes advantage of topography and climatic factors to make the best use of the rangeland.

**E**nvironmental disturbances (severe and prolonged cold weather, snowstorms, drought, etc) that are highly unpredictable often affect Tibetan pastoral areas. The organizational flexibility of the traditional Tibetan nomadic pastoral production systems developed as a response to this unpredictability of the grazing land ecosystem. Nomadic pastoralism on the Tibetan Plateau can be viewed as an excellent strategy to optimize scarce grazing resources in a harsh environment in which forage productivity is low and extremely variable. A strategy of livestock herd movement, or mobility, is an appropriate response to the environmental situation early Tibetan herders were faced with when trying to design livestock and grazing systems to exploit rangeland resources.



**Mongol sheep and camels on the move, Wild Yak Valley, Qinghai, China, 1990**





**Yaks moving to summer pasture, Aba, Sichuan, China, 1996**



**Adjusting load on yak, Aba, Sichuan, China, 1996**



**Sheep moving to autumn pastures, Henan Mongol, Qinghai, China, 1997**

**F**or Tibetan nomads, environmental tracking and manipulation are key elements of the pastoral system, as they are for most pastoral societies. Certain vegetation types, such as wet, *Kobresia* sedge meadows, that green early are sought out by herders. Other ranges, that are free of snow in the winter due to local topographic and climatic conditions, were identified for winter and early spring grazing. Tibetan nomads only incidentally achieved direct control of the rangeland environment though, since skills, instead of tools, were the most important component of their traditional pastoral technology. Intervention by nomads was significant, however: certain rangelands were reserved from grazing during the growing season for use later in the year; seasonal water sources were exploited; and fire was used to control shrubs and to promote new grass growth. These days, tools (fencing, barns, and wheeled transport) are also being used increasingly by Tibetan nomads to exert more direct control over the pastoral environment.

Tibetan nomads attained indirect environmental tracking and manipulation of the Tibetan rangeland environment with considerable skill, however. The structure of nomads' herds, in terms of the number of breeding females, breeding males, young stock, and pack stock, illustrates Tibetan nomads' skills in adjusting herds to exploit available resources. The different species' composition of animals in livestock herds found among Tibetan pastoralists is also indicative of nomads' expertise in managing rangeland resources available to them.





**Moving camp, Henan Mongol, Qinghai, China, 1997**

**Moving to summer pastures, Zamtang, Sichuan, China, 1996**

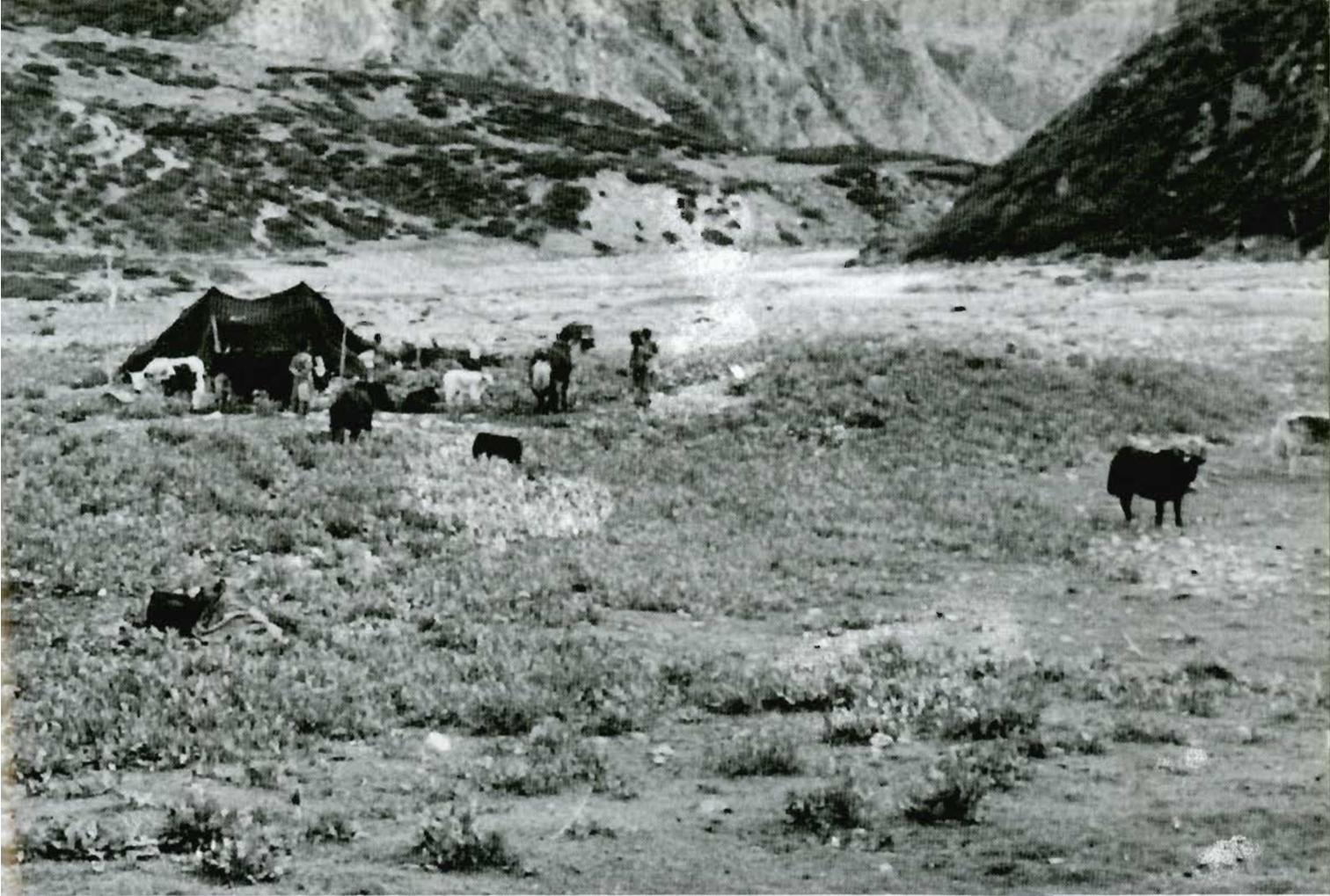




**Nomad camp, Shey Gonpa, Dolpo, Nepal, 1978**



**Yak herder, Saktien, Bhutan, 1990**



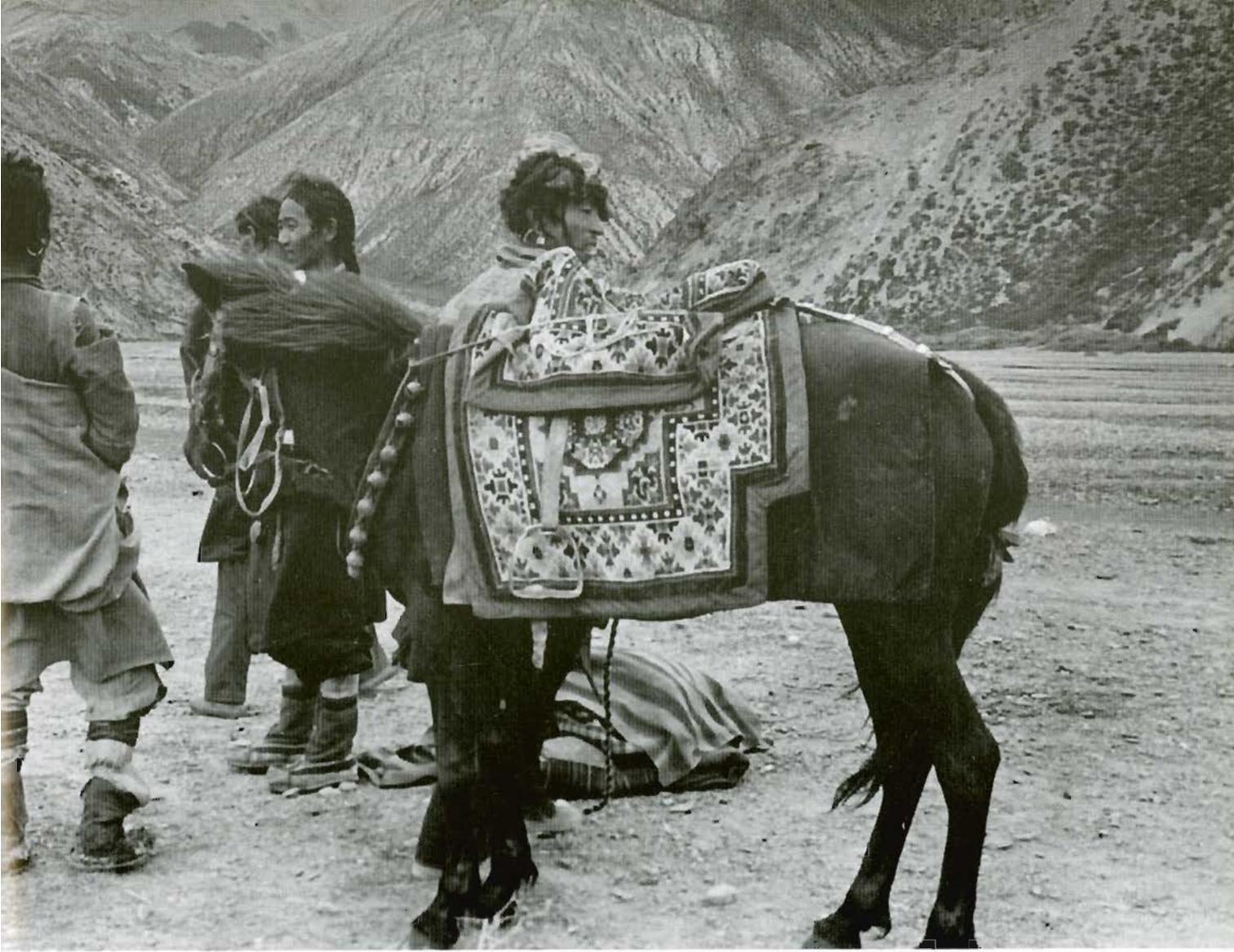
**E**xtensive pastoralism has been the basis for livestock production across most of the Tibetan Plateau for millennia. In recent decades, efforts to develop Tibetan pastoralism through introduction of new livestock breeds, veterinary health care, pasture development, and range management have yielded little, or even negative, return on investment. Growth in livestock production in Tibetan pastoral areas has generally occurred from expansion in livestock numbers with traditional practices still being widely practised, instead of from adopting new livestock production technologies giving higher yields per animal. Government development efforts in many pastoral areas of the Tibetan Plateau in China now focus on reforms in rangeland tenure (privatisation and enclosure of rangelands) and investments in fencing, houses for nomads, and barns for livestock. It is thought that such developments will improve rangeland and livestock management and increase livestock productivity. Often, however, the basic characteristics and constraints of nomadic production in Tibetan rangelands are not considered when prescribing these new developments.

The central characteristics of Tibetan pastoralism – low productivity, high variability in forage and livestock production, generally low production density, and high market transaction costs – has meant that conventional markets in land, labour, and capital have not become well developed. Tibetan nomads have, nevertheless, developed arrangements (often quite sophisticated) for meeting their labour requirements, for managing rangeland without exclusive private property rights, and for allocating their livestock as capital in the absence of financial markets. The absence of viable markets and high transaction costs often preclude nomads from selling more animals to the marketplace. Since costs for maintaining animals are low, it is usually profitable to hold animals, although critics of pastoralism often maintain that nomads just keep large numbers of animals as a status symbol.

Over the centuries, Tibetan nomads acquired complex knowledge about the environment in which they lived and upon which their lives depended. The fact that numerous, prosperous pastoral groups remain to this day, despite living in one of the harshest pastoral areas on earth, bears witness to the extraordinary knowledge and animal husbandry skills of the nomads. Nomads have intricate ecological knowledge and understanding of the rangeland environment. Pastoral development specialists need to access this vast body of indigenous knowledge and incorporate such information in range-livestock development programmes. Nomads should be considered as 'experts', even though they may be illiterate. Many old Tibetan herders have probably already forgotten more details about rangelands and yaks than most young range ecologists and animal nutritionists will ever learn.



**Young herder and horse, Namdo Valley, Dolpo, Nepal, 1978**



**Herders and horsemen, Namdo, Dolpo, Nepal, 1978**



**Happy nomad man, Dolpo, Nepal,  
1978**



**P**astoral development policies on the Tibetan Plateau, as elsewhere in much of the pastoral world, often maintain that nomads are 'backward' and that their traditional practices need to be 'improved'. Policies also often dictate that herds need to be restructured to contain an optimum, or economically efficient, composition of livestock species and age classes of animals. Such policies are often prescribed by people with limited understanding of pastoral production systems and with little appreciation of the fact that nomads have been herding animals for thousands of years and, in many instances, already had or possess quite sophisticated systems for managing rangelands and livestock. Nomads have, after all, been raising animals on these grasslands for thousands of years and over time have worked out how best to use grazing land resources. Fortunately, many aspects of traditional Tibetan nomadic practices are being seen increasingly by some researchers as highly efficient strategies for range management and livestock production in the high, cold environment of the Tibetan Plateau.



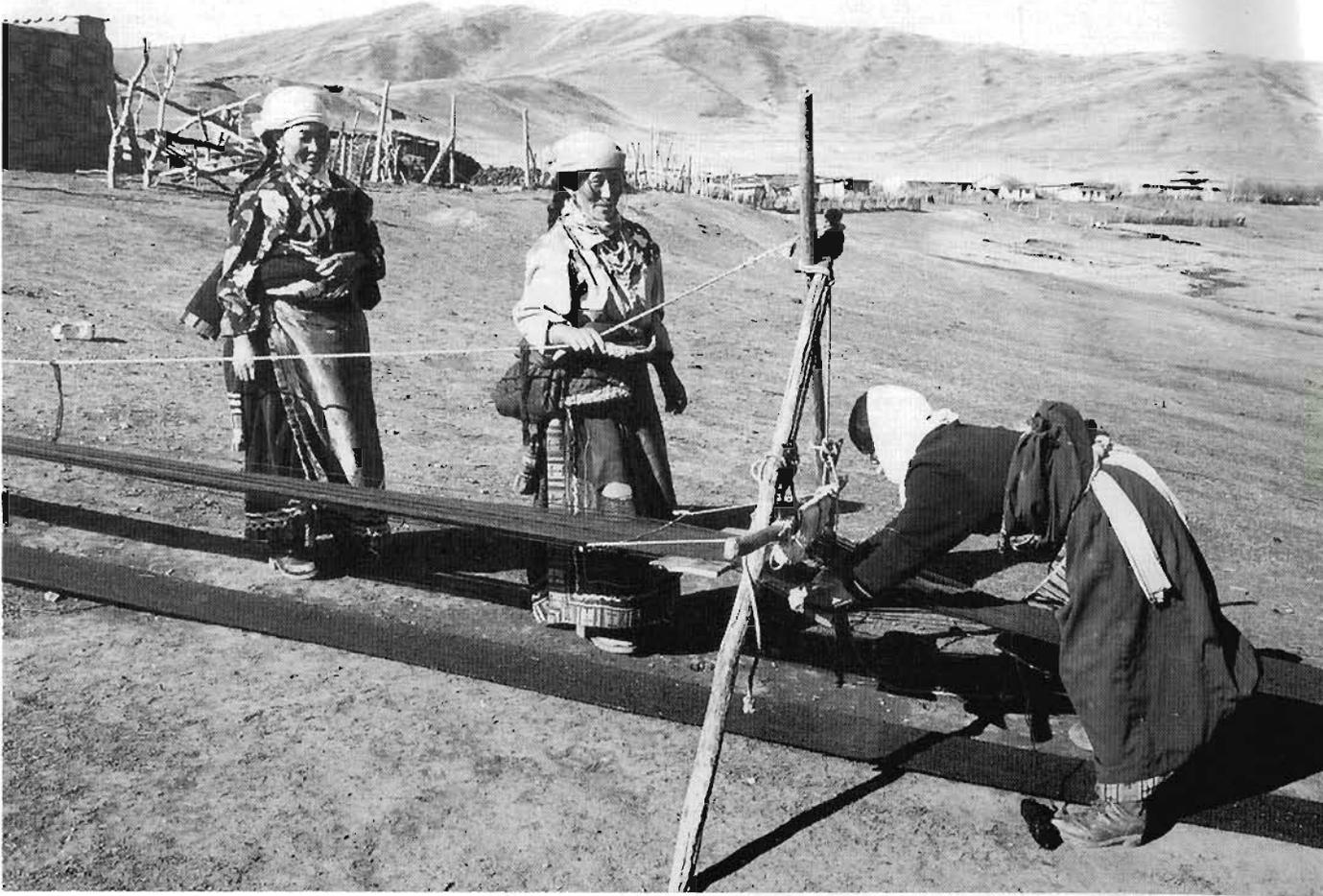
**Nomad camp, Phala, Tibet, China, 1997**

The increasing appreciation for the complexity and ecological and economic efficacy of many aspects of Tibetan pastoral production systems is encouraging. It provides hope that the vast wealth of knowledge that nomads possess will be better appreciated and understood and used in designing more appropriate development interventions for pastoral areas. It also provides hope that the nomads will be listened to and involved in the planning and implementation of pastoral development programmes in the future.



**Lady spinning wool, Tarap,  
Dolpo, Nepal, 1978**

**S**ince the first nomads ventured on to the Tibetan steppes and began raising sheep and yaks, perhaps 4,000 years ago, their very existence has depended on spinning and weaving skills. Since the beginning of Tibetan civilization, Tibetans have been exposed to various Central Asian weaving centres. In the eighth century AD, the Tibetan Empire controlled the Silk Route oasis-city states, such as Khotan, where carpets were known to be made. Spinning and weaving techniques moved along the Tibetan frontier, linking cultures, spinners, and weavers. Over time, various ethnic influences and trends were absorbed by Tibetans and incorporated into the formation of their own unique aesthetic styles. Old Tibetan carpets exhibit an elegance that is finally beginning to be better appreciated. These ancient spinning and weaving talents continue, in an intact legacy, even now. Nomad men still spin sheep and yak wool and yak hair. Women weave wool into material for tents, blankets, bags, and clothing. Men braid ropes. These items are still used in everyday nomadic life.



**Weaving yak hair, Hongyuan, Sichuan, China, 1996**

**Detail of a yak hair tent, Lugu, Gansu, China, 1996**

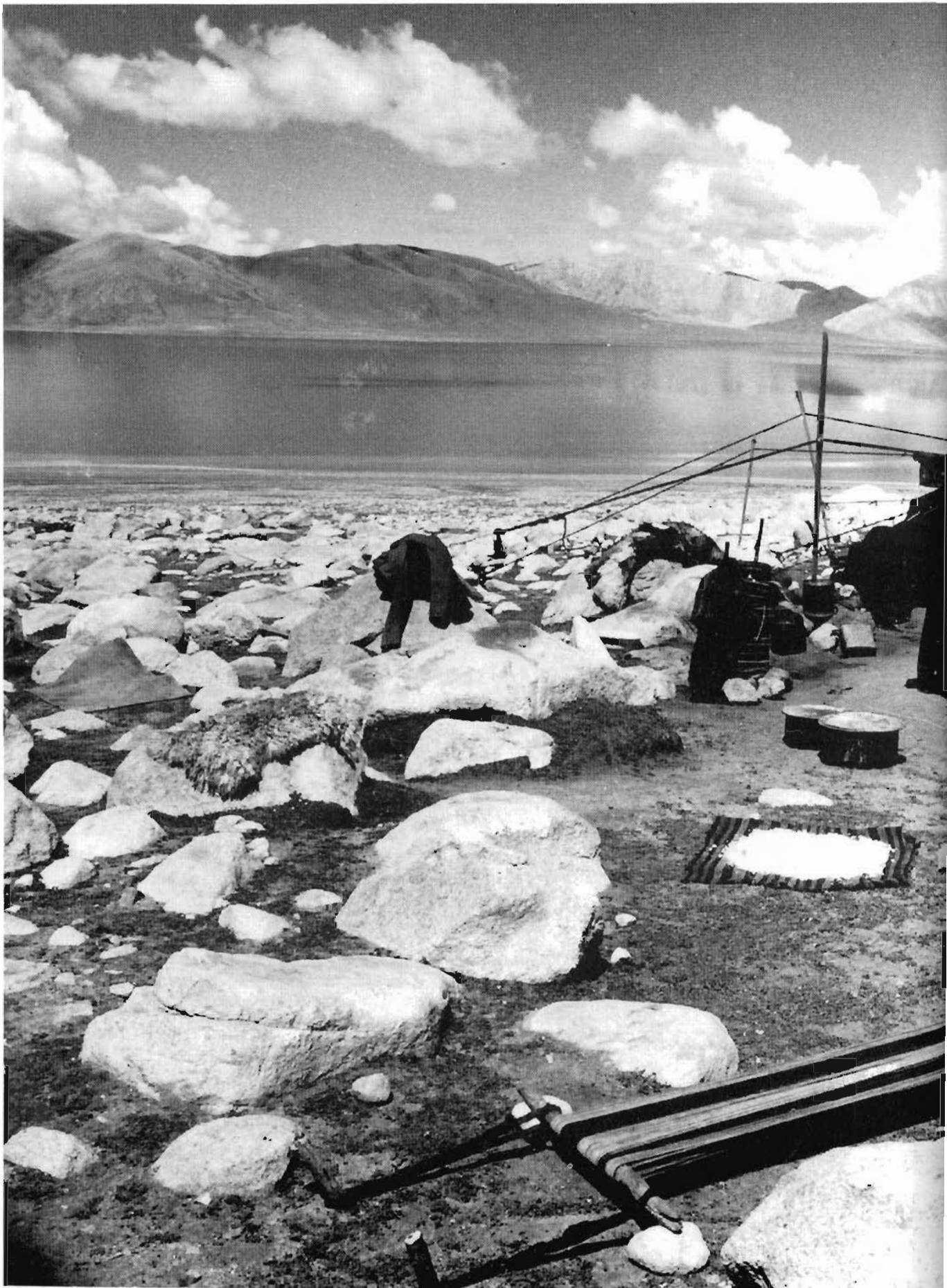






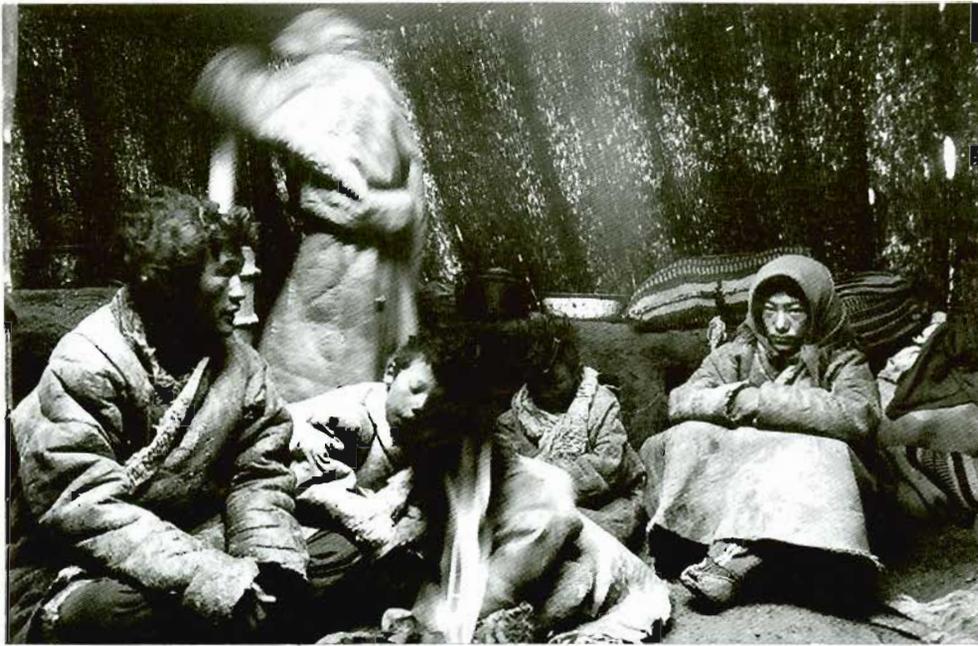
**Man spinning wool, Saktien, Bhutan, 1990**

**Man spinning wool, Namdo,  
Dolpo, Nepal, 1978**

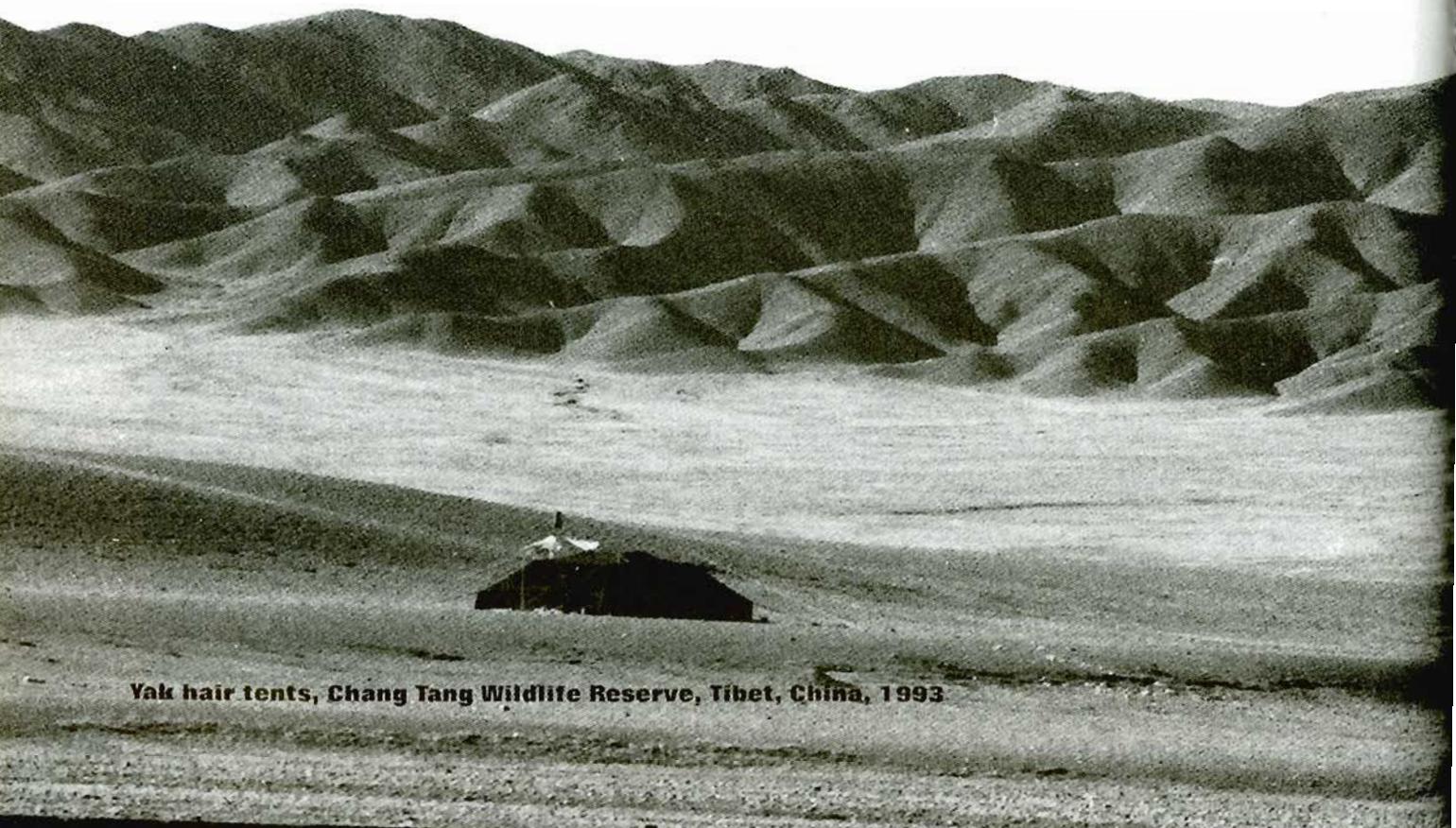




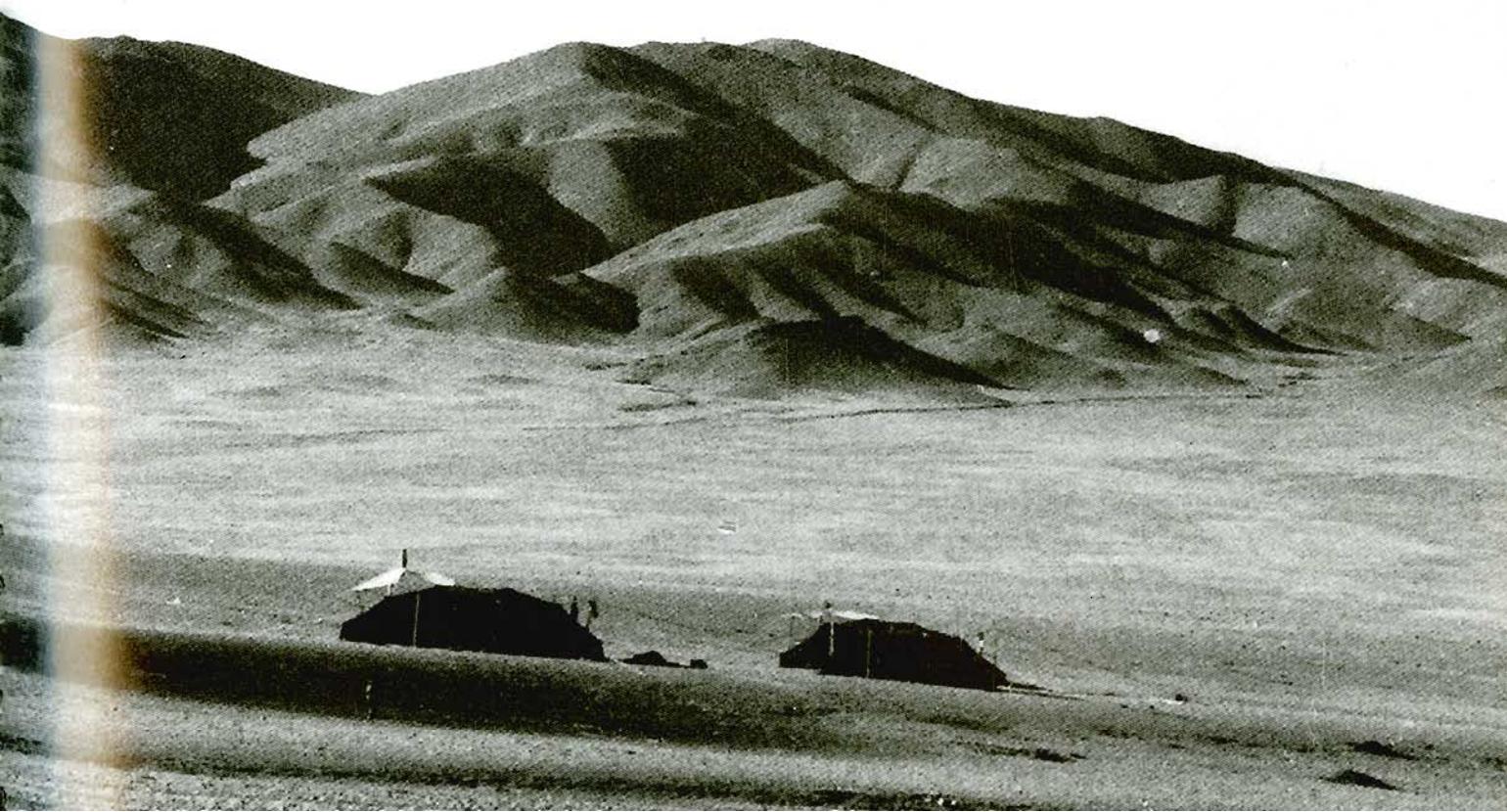
**Woman weaving, Phala, Tibet, China, 1997**



**Inside a yak hair tent, headwaters of Yangtze River, Qinghai, China, 1993**



**Yak hair tents, Chang Tang Wildlife Reserve, Tibet, China, 1993**





**Tibetan tent, Zeku, Qinghai, China, 1997**



**Yak hair tents and grazing land, Shey Gonpa, Dolpo, Nepal, 1978**





**Tibetan tent and rangeland, Aba, Sichuan, China, 1996**



**Y**ak hair tents are a prime example of the Tibetan nomads' skill in adapting to life on the vast, windswept plains of the Tibetan Plateau. Locally made from the long, coarse hair of the yak, Tibetan tents are very much suited to a nomadic lifestyle. They can be easily taken down and packed on yaks when moving camp. They keep out the rain, yet let in light. Sections of the tent that become old and frayed can be easily replaced with new strips of woven yak hair. Tents have been perfected to stand up in the fierce winds that blow across the Tibetan plains in winter. The size and design of Tibetan nomads' tents varies across the Tibetan Plateau but, wherever they are found, Tibetan yak hair tents are an excellent shelter that have suitably served nomads for thousands of years.



Nomad tent, Luqū, Gansu, China, 1996





Inside a Tibetan nomad tent, Luqu, Gansu, China, 1996

**M**ongol nomadic influences are also found on the Tibetan Plateau, especially in the northeastern rangelands around Qinghai Lake (Koko Nor). Mongol influence dates back to the 13<sup>th</sup> century when Khubilai Khan dispatched Mongol troops to Tibet and set up an administration system patterned on Mongol rule in conquered territories. In the early 1600s, the Khoshot Mongol chief, Gushri Khan invaded Tibet, which resulted in many Mongols settling in Tibetan areas. Mongol nomads still inhabit grazing lands in the Qaidam Basin and surrounding Kunlun Mountains in Qinghai Province. Many Mongol nomads that settled on the northeastern Tibetan grazing lands (such as in Henan Mongol, Qinghai Province) have become Tibetanised over the centuries, but they continue to use the traditional Mongol felt tent. Many of the Mongol nomads also raise the Bactrian, or two-humped, camel. Camels were a common sight in Lhasa as caravan animals before the advent of roads in the early 1950s.



**Camels, horse and nomad, Wild Yak Valley, Qinghai, China, 1990**

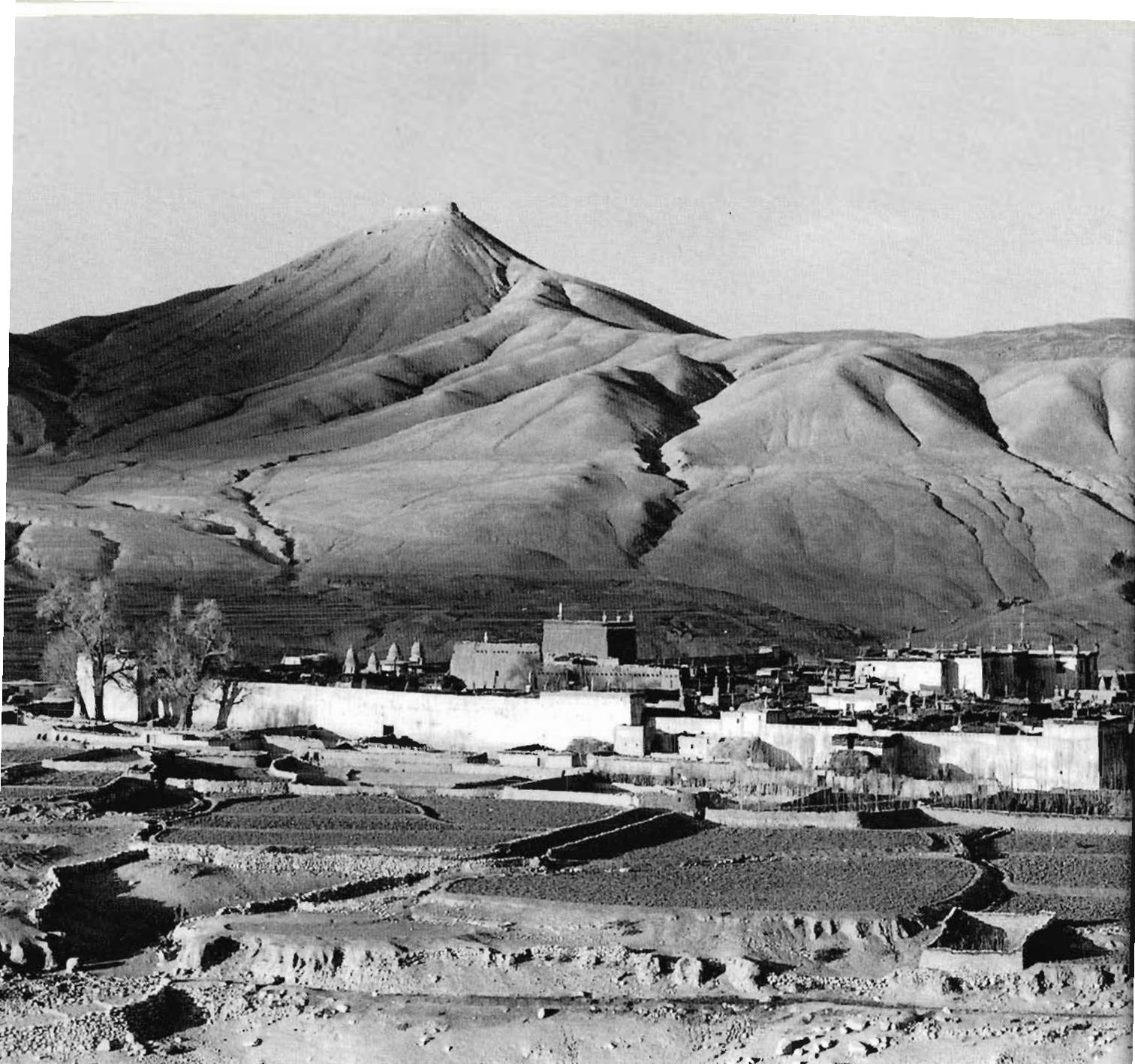




**Mongol camp, Wild Yak Valley, Qinghai, China, 1990**



**Nomad camp, Henan Mongol, Qinghai, China, 1997**

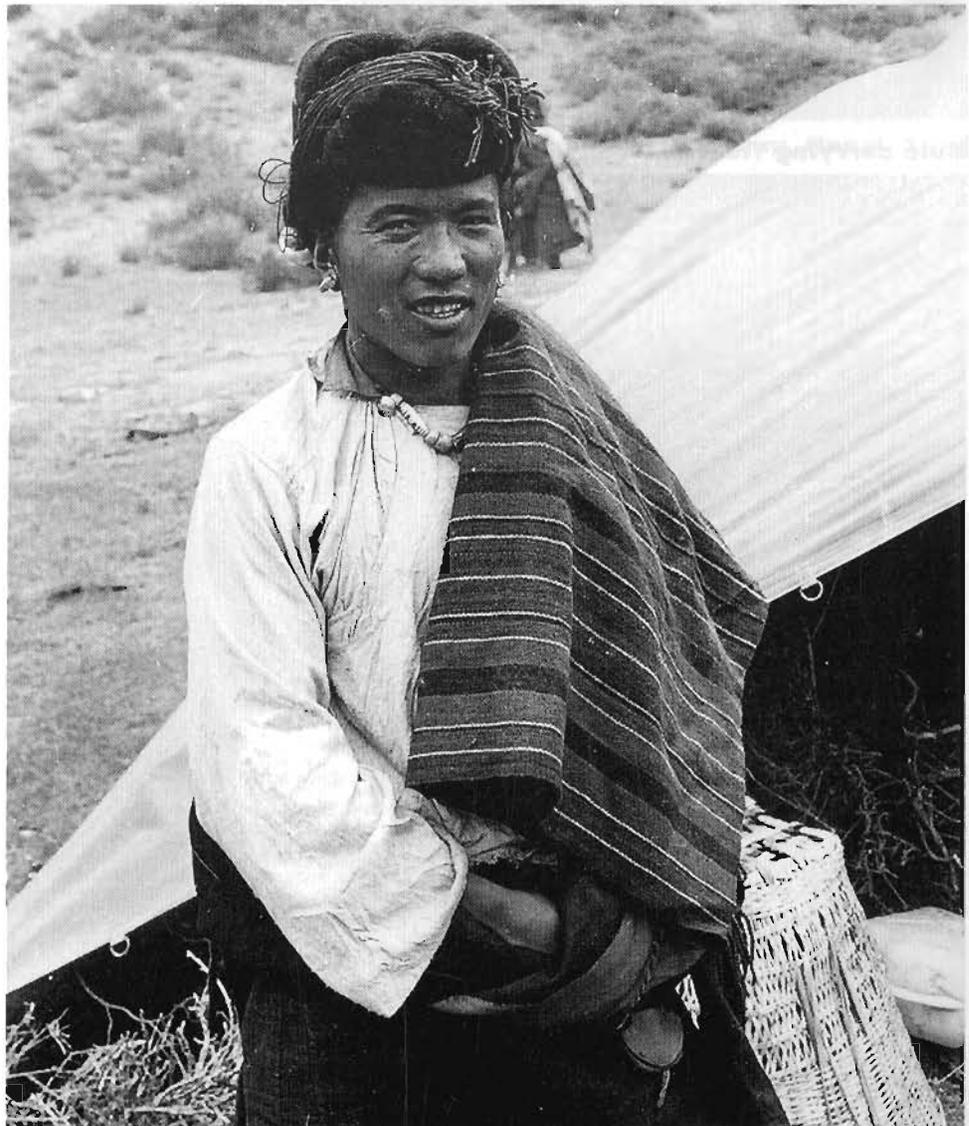


**The walled city of Lomanthang, Mustang, Nepal, 1992**

**T**rade and links with agricultural communities have always been important features of pastoralism in the Himalayas and on the Tibetan Plateau. Trade represented an essential element in the pastoral economy in most areas and, for some pastoral groups, defined the structure of their herding operations as well. Various factors, such as ethnicity, religion, subsistence patterns, and environment, played key causal roles in the development of trading enterprises within each community. For centuries, this trade linked pastoral regions with grain-producing areas and both the means of transport and the basic characteristics of this trade remained constant over long periods of time. In much of the Himalayas, trade was based on the exchange of grain for salt and wool in Tibet and the subsequent bartering of Tibetan salt for grain. In the eastern Tibetan grasslands, a lively tea-horse trade developed during the Tang dynasty with Tibet supplying horses to the Tang court in exchange for Chinese tea.



**Village of Saldang, Dolpo, Nepal, 1978**



**Nomad trader, Namdo, Dolpo, Nepal, 1978**

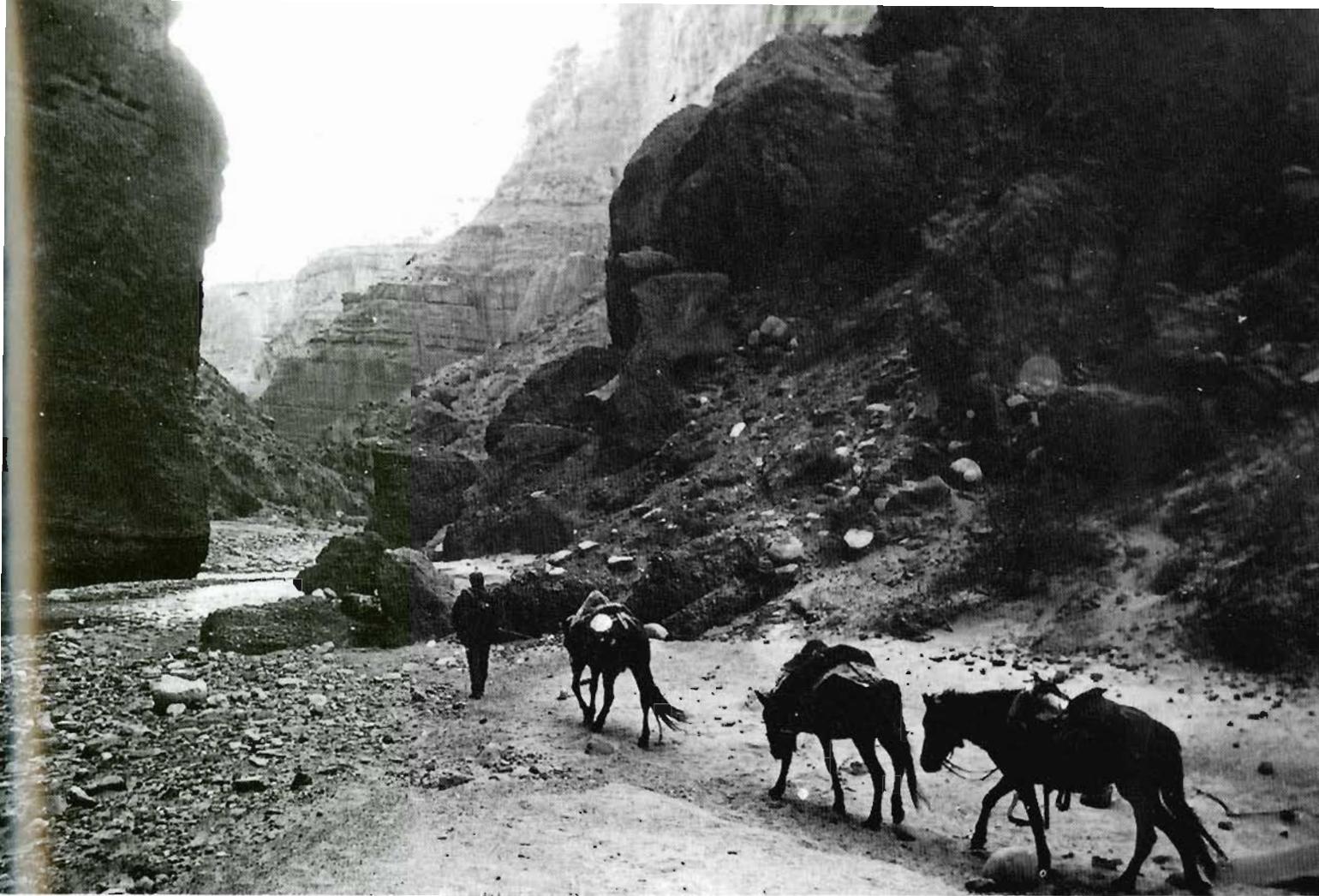


**Pack saddles and loads, Chharang, Mustang, Nepal, 1992**



**Mule carrying Tibetan wool, Birethanti, Nepal, 1984**





**Horses along Kail Gandaki River, Mustang, Nepal, 1992**



**I**t is unclear when trade across Tibet and through the Himalayas began, but it must have been flourishing when the Central Asian city-state of Khotan was founded in 250 B.C. The opening of the Silk Road in the first century B.C. ushered in a period of rapidly expanding trade across Central Asia and across Tibet to India. Pastoralists must have contributed to, and been a part of, much of this trade. Annals from the Han Dynasty (220 BC-202 A.D.) indicate that large trade marts had been operating for centuries in the Koko Nor (Qinghai Lake) region on the northeastern edge of the Tibetan Plateau, with horses highly valued. Luxury saddles were also fashionable among Chinese officials at this time and both Tibet and Mongolia were sources of horses for the Chinese emperors.

For much of the period of Chinese-nomadic interaction, the amount of and frequency with which goods were exchanged were often dictated by the nomads. Contrary to widely held beliefs about Chinese domination over barbarian nomadic tribes, in reality it was often the Chinese who offered tribute to nomadic rulers. Silks and princesses were presented to nomads in exchange for a cessation of hostilities. At one time in the seventh century A.D., the Tibetan Empire was receiving an annual tribute of 50,000 bolts of silk from China. Homage was also made by the Chinese to the nomads in order to establish trade marts on the frontier. Discoveries of fine carpets, textiles, porcelains, and other Chinese and Sogdian adornments in nomad areas indicate the level of sophistication and desire for Chinese goods that these nomadic barbarians had attained. It also sheds light on the degree of trade and cultural contact that existed between nomadic and settled civilizations.