Ladakh, threatened Himalayan mamma

Ladakh, a remote region of India lying between the Himalayas and Tibet, is ethnically and geographically distinct from the rest of the country. Because of its isolation, change came later to Ladakh than to other parts of the Himalayas, but recent years have seen the familiar pattern of social change, human population increase, tourism and rural development beginning to affect the environment. The authors, jointly and individually, made a series of visits to the area to investigate the status of the wildlife and to look at conservation measures.

The opening of Ladakh in 1974, and popularisation of the area by the media, has focused considerable attention on this remote, trans-Himalayan region. Most of the attention is from people aware of the commercial potential of another 'unspoilt' ethnic community with the result that since 1974 trekking and tourism have become big business in Ladakh and the region is fast losing its original character; this process of social change began on a large scale in 1962, following the war between India and China, when large numbers of soldiers and government officials were sent to Ladakh. During the days of British rule, people visited Ladakh to hunt for trophies, and several of them have left accounts of the wildlife (e.g. Kinloch, 1892; Rawling, 1905; Stockley, 1936). Recently however, the fauna has received little attention and only two works have appeared (Ganhar, 1979; Gergan, 1962).

Ladakh covers some 100,000 sq km of the Indian state of Jammu and Kashmir. The region stretches into the north-eastern extremity of the Karakoram and includes the western limits of the Tibetan plateau. Access is forbidden beyond the 'Inner Line' which delineates sensitive zones near India's borders with Pakistan and China but most of Central Ladakh and Zanskar is freely accessible. The climate is one of extremes, with considerable daily and seasonal variations in temperature. Rainfall is scanty and the landscape arid and inhospitable. Winter temperatures fall to −30°C and below and although heavy snowfalls occur on the main Himalayan ranges, far less falls in Ladakh. The country is extremely rugged and mountainous with peaks over 6200 m and passes up to 5500 m. The vegetation is characteristic of a high-altitude desert. Trees are few: *Juniperus* spp. grow mainly on high, inaccessible slopes or in remote valleys; they have been gradually reduced over the years by felling for timber and for fuel and by the cutting of foliage for incense. Along valley floors there are thickets of *Salix* spp., *Populus candicans, Myricaria germanica* and *Hippophaë rhamnoides*; these thickets may be extensive where human settlements are few or absent, but they have been cleared from many places near large villages. Otherwise the vegetation is limited to alpine and xerophytic plant communities which become fewer with increasing altitude. Villages are situated in those places where water and sufficient open ground to construct field terraces coincide; the people grow barley, peas, wheat (at lower elevations) and a few vegetables, as well as apricots, apples and walnuts in those villages lying below 3250 m. The Indus valley and Zanskar valley both contain relatively short broad sections, which allow more

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stronghold of rare ls

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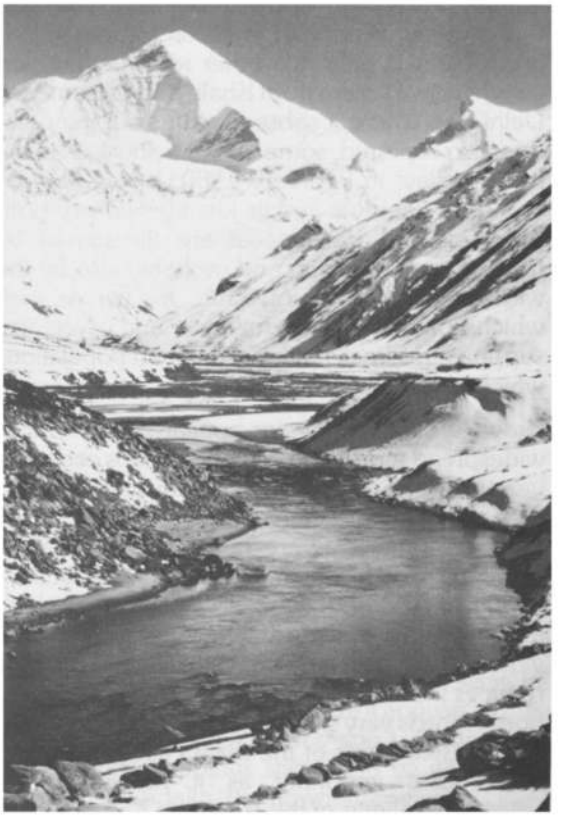
extensive areas of cultivation to be developed. Culturally and ethnically the area is Tibetan with predominantly Buddhist inhabitants who cultivate the valleys between 2750 and 4300m. Semi-nomadic herdsmen inhabit the eastern plateau and keep large flocks of sheep, goats, yaks, cattle and cattle/yak hybrids, together with some horses and donkeys. All these animals are also raised in the mountain villages, though in smaller numbers.

Some reconnaissance work was done in 1976 and 1977; the wildlife surveys were carried out during the summers of 1980 and 1981 and the winters 1980/81, 1981/82 and 1982/83. Information was collected by using sightings, tracks, droppings, the presence of dead animals and the systematic interviewing of local informants from all parts of Ladakh; comparisons with earlier times were made by collating reports from the many accounts by sportsmen. The influence of human activity on the environment was assessed by noting the occurrence of hunting, grazing, cultivation, fuel collecting and developments such as road building.

The fauna

The snow leopard *Panthera uncia* occurs throughout Ladakh but is nowhere common; that this has long been its status in Ladakh is shown by the paucity of records by sportsmen, who all describe the species as rare. Over most of Ladakh it would appear that its numbers, though small, have not greatly declined over the past few decades or longer. During each of the three winter visits we found tracks and droppings in many valleys, down to 3200 m. At this time, snow leopards frequently attack domestic livestock, and if caught by the villagers may be killed. Just as often however, they are simply driven away with shouts and stones, since many villages are without guns. This stems from one of the tenets of Tibetan Buddhism, namely that any taking of life is sinful, and also explains why in most of Ladakh



The Suru Valley and the highest peak in Ladakh—Nun Kun, 23,500 ft *(Ben Osborne)*.

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there are few professional hunters. However, in the Suru valley and in one area of Zanskar hunters are much more active, largely from the Moslem minority there, who have no religious inhibitions about killing. We were told of five occasions in the last five years when snow leopards had been shot in the Suru valley. This activity is illegal but the rewards are high since a pelt is worth up to 2500 rupees (£160) in Srinagar or Manali. During the summer snow leopards follow their major prey species, bharal *Pseudois mayaur* and ibex *Capra ibex* to the highest ridges and pastures and are never seen.

The lynx *Felis lynx* is local and very rare. Few people have seen them though we found lynx pelts in a fur shop in Leh and tracks in riverine scrub in a remote gorge. The few records of this species are scattered throughout Ladakh from the eastern plateau to the central mountains. The other felid in Ladakh, Pallas's cat *Felis manul* is equally rare and apparently restricted to the lower Indus valley. We found one skin for sale in Leh and obtained only two other records: one was caught downstream from Khalsi and presented to Delhi Zoo where it subsequently died; the other was also captured, some 75 km below Leh in the Indus valley, in February 1980. It was seen by one of the authors and its identity verified. Both the lynx and Pallas's cat are threatened by trapping and shooting and probably also by the widespread removal of scrub, for use as fuel, which both species use for cover and which also supports the small mammal and bird populations which constitute their prey.

Brown bear *Ursos arctos* appeared to be more widespread than we expected, perhaps occurring year-round in Suru and northern Zanskar, and they are regularly seen in these areas in summer and autumn. Bears are rarely shot and, apart from one story of a bear trying to enter a house in winter, they do not generally threaten people or domestic stock and are therefore not looked on as vermin. Bear skins are not valuable and this also reduces the incentive to shoot them. The Ladakh population is very small when compared to that in the forested areas of the main Himalayas but is nonetheless important as it represents the easternmost limits of this species in Kashmir.

Wolves *Canis lupus* are widespread and relatively

Wolf trap—not used very often these days. A donkey is used as bait and the wolf is stoned to death once it is in the trap. The trap lip is overhanging so that neither the donkey nor the wolf can escape *(Ben Osborne)*.

common throughout Ladakh. They are regular, year-round predators on domestic stock and thus far more harmful than snow leopards. On this account they are universally regarded as vermin and killed whenever possible. Traditional wolf traps are found in many villages. Wolves occur in all habitats in Ladakh and in a wide altitude range from the river valleys to the snowline. We found tracks and droppings in many localities but saw only two animals; this suggests there may have been some depletion in numbers this century, since in early published accounts there are many reports of wolves seen or shot. Wolf skins are not as valuable as those of snow leopards though we did find highly priced wolf skin coats in Kashmiri crafts markets in Delhi and were told that the skins came from Kashmir, which probably means that many of them came from Ladakh as the wolf is scarce elsewhere in Kashmir.

Specimens of the wild dog *Cuon alpinus* have been obtained from Ladakh (Kinloch, 1892) but they are extremely rare now and we found only one person who had seen this species (in 1968; one animal, which he shot). We were also told that they had been seen in the Suru valley 40 years ago but not since.

Foxes *Vulpes vulpes* are widespread and common in all habitats. Fox pelts are worth up to 500 rupees (over £30) and foxes are trapped as a result. While this is illegal and should be stopped, it is unlikely that persecution of foxes is wide-

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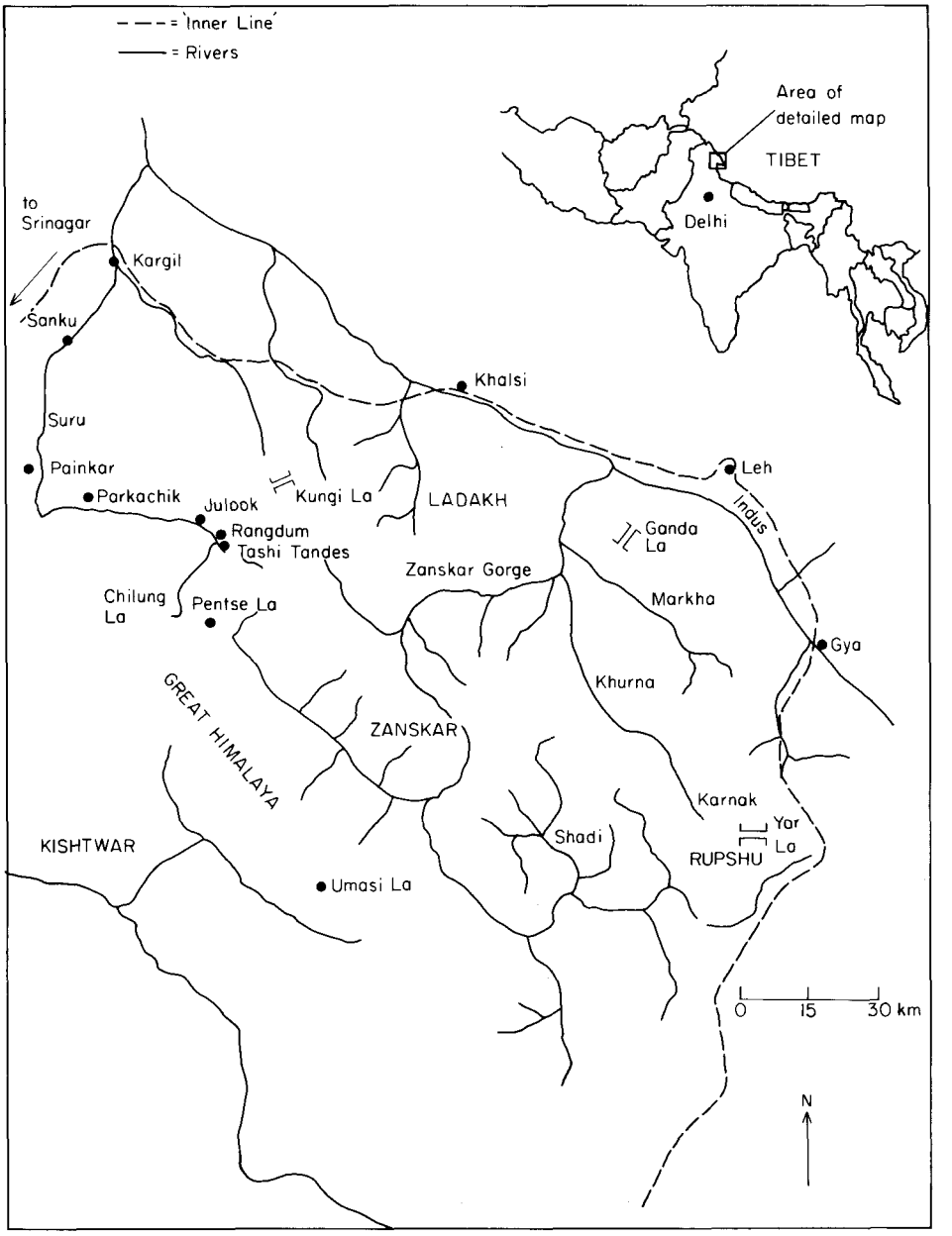

spread and the clearance of scrub may be a greater threat; it reduces cover and the populations of small mammals and birds on which, in part, the foxes prey. The mustelids are represented by three species: Siberian weasel *Mustela sibirica*, beech marten *Martes foina* and the European otter *Lutra lutra*. The Siberian weasel is common and occurs around villages, in river valleys and occasionally high up in the mountains. The beech marten is a rarely seen inhabitant of rocky valleys, where it appears to prey largely on pikas (*Ochotona* spp.). Evidence of tracks and droppings show it to be widely distributed in Ladakh, but nowhere common. Otters are found in very small numbers along the Indus (up to 50 km above Leh) and in the lower part of

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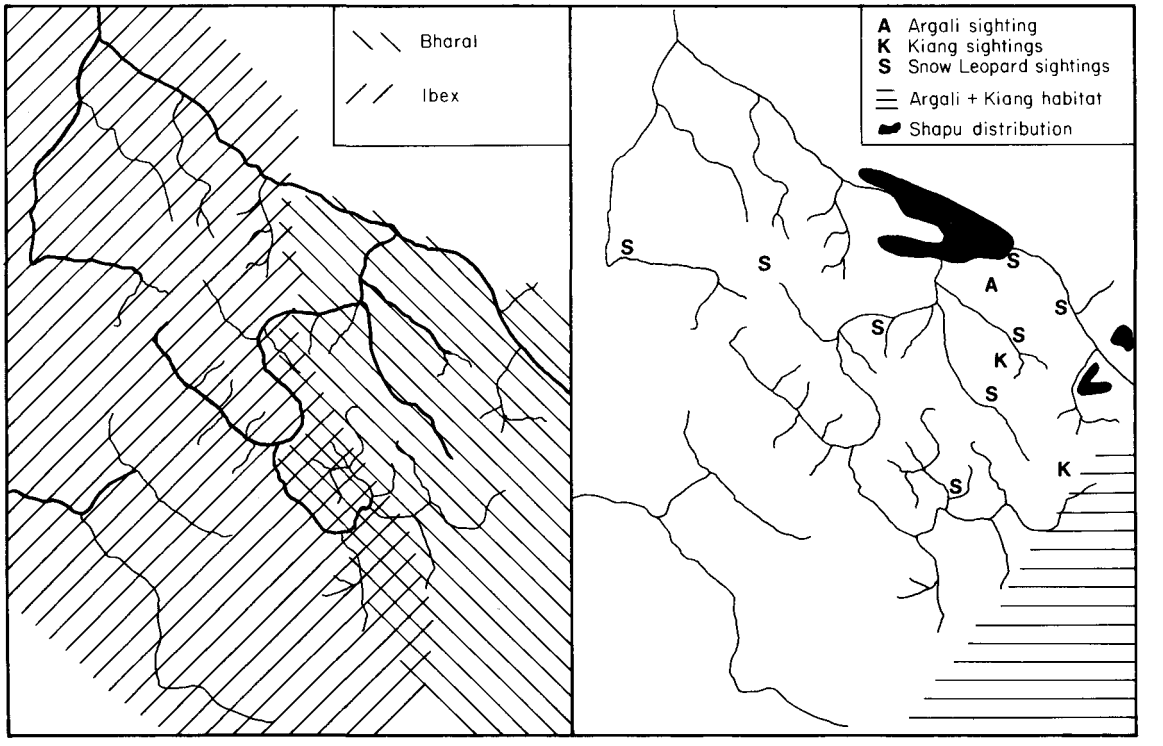
the Zanskar river. They may also occur in the Suru and Dras rivers and the Nubra-Shyok system.

The Tibetan wild ass *Equus kiang* remains fairly common on the eastern plateau. Only a very small minority of Ladakhis eat its flesh and being hornless it has not been hunted for trophies. Occasionally it wanders into the mountains on the western fringe of the plateau, where one author saw five in 1981. Two individuals were regularly seen in the Rabrang Nullah (some 40 km into the high mountains) over a period of ten years, but have not been seen since 1979.

Another species of the eastern borderlands is the argali *Ovis ammon hodgsoni* which is mainly restricted to altitudes above 4500 m in mountainous parts of the plateau. Their numbers have been reduced by hunting for the male animals' enormous horns, but their wariness and the difficulty of access to their territory in many cases appears to have allowed a small but stable population to survive in eastern Ladakh, from Gya, southwards and eastwards. An isolated group of six individuals inhabits the hills around the Ganda La, south of Leh, and is nominally protected by the local people who complained so bitterly when one of the argali was shot by army personnel that such an incident is unlikely to be repeated.

Another species of wild sheep found in Ladakh is the Ladakh urial, locally known as the *shapu*, *Ovis orientalis vignei*. It is found in the Indus valley and its tributaries, and there are also populations in Nubra (northern Ladakh) and in Baltistan. We found several groups in the Indus valley and estimate the total population in Ladakh to be between 500 and 750 which represents a considerable reduction of the plentiful herds reported by early visitors. They live at low altitudes in the main valleys and are the most accessible and vulnerable of the ungulates in the area to hunting, for meat and trophies. All the ungulates living in the mountainous parts of Ladakh are threatened to a greater or lesser extent by competition for grazing with domestic



The distribution of some of the main mammal species in Ladakh.

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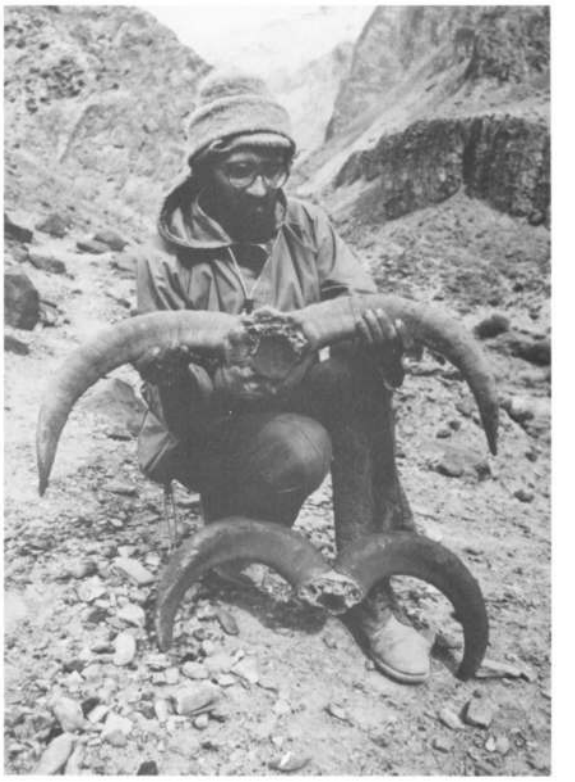
livestock, and by the collection of shrubs for use as fuel. Bharal *Pseudois nayaur* are distributed throughout the eastern half of Ladakh and in places are common. They occupy steep, rocky slopes and cliffs between 3200 and 5000 m and the comparative remoteness of much of their habitat means that they do not suffer intensive hunting pressure. We observed this species in many localities and found nothing to suggest there had been a significant decrease in population in recent years, and it seems likely that the mountains of Ladakh represent a stronghold of this species in the Himalaya.

Ibex *Capra ibex* are also quite common in several places and are widely distributed except in the east of Ladakh; there is a considerable overlap in the range of this and the preceding species. They favour precipitous habitats, and avalanches in winter and spring are a regular cause of mortality. The Forest Department estimated that there are 'thousands' in the whole Suru valley area, which does not seem an exaggeration. Although there are no current licences to hunt ibex, they are regularly shot, especially in Suru. The main product is meat (worth about 40 rupees per kg) though the skin and horns are also used, the latter for archery bows which can fetch up to 400 rupees. These bows are highly prized possessions in Ladakh where archery is a popular sport. Ibex suffer less than other species from grazing competition owing to the inaccessibility of their habitat.

There are three species whose world range is more or less restricted to Tibet and which in the past were regularly found on the high plateaux of eastern Ladakh. The wild yak *Bos mutus* and Tibetan antelope *Pantholops hodgsoni* both formerly occurred in the Changchenmo valley, which has been under Chinese administration since the Sino-Indian border war of 1962. Two authors (Rawling, 1905; Lydekker, 1913) reported that wild yak had already disappeared from Changchenmo and we were unable to obtain any recent information on that area. Tibetan antelope are still seen in summer in extreme northern Ladakh at one or two places along the old caravan road to Yarkand. Tibetan gazelle *Procapra picticaudata* were once common in south-eastern Ladakh but have been regularly shot and now only very few, if any, survive, in the area of Hanle.



Bharal horns like these often adorn religious cairns. They are probably taken from animals which died naturally *(Ben Osborne)*.

Conservation

Current threats to both flora and fauna include 'local' activities—scrub clearance, tree-felling, grazing by domestic stock, illegal hunting and trapping—and those that could be classified under the more general heading of 'development'—road construction and hydroelectric schemes. Tourism has begun to offer a threat, so far on a small scale; tourists are creating a demand for furs and travellers are causing some damage along popular trekking routes.

So far, the human pressure in Ladakh is not as severe as in the ecologically similar areas in northern Pakistan (Schaller, 1977). But the resident population in Ladakh has increased sharply in recent years and tourist numbers have built up from 200 in 1974 to an estimated 15,000

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Donkeys carrying firewood. Wood is a major export from some valleys and the remaining scrub is under considerable threat, especially in view of the damage already caused by heavy goat browsing *(Ben Osborne)*.

in 1977 and are undoubtedly higher than that by now. In particular, these increases have put intense pressure on the relatively accessible Indus valley, where the population increase has been highest and where the tourist pressure is greatest. Not surprisingly, there are already signs that excessive pressure is being exerted on this fragile cold desert ecosystem and there is an urgent need for adequate environmental protection measures.

At present all hunting is banned in Ladakh, but this legislation is difficult to enforce when a small Forest Department staff, based in Leh and Kargil has to cover a huge area. However, the traditional avoidance of killing by the Buddhist population has ensured that hunting took place on a much smaller scale than in most other parts of the Himalaya. The State government has recently designated one high altitude national park and four game reserves in Ladakh, as well as five wetland reserves. If implemented, these plans would be an important contribution to Himalayan conservation. The creation of a national park would automatically involve the provision of adequate wardening at the levels dictated by the Government of India, would provide a focus for conservation education in Ladakh and would attract tourists to areas where they could be adequately supervised. Hopefully the new measures will be implemented in the near future. Initially it may only be possible to protect the most threatened areas (the valleys of the Indus, Markha, Suru and Zanskar rivers) though scope for further conservation measures is limitless. However, Ladakh is not a wilderness; with the exception of the glaciers, inaccessible gorges and the very highest slopes, every part of Ladakh is used by local people for grazing, farming or firewood collection. Any conservation measures adopted will have to take into account the needs and traditional rights and patterns of life of these people and resolve in an equitable way any apparent conflict between the needs of the wildlife, the people and the preservation of the

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environment as a whole. It is clear that wildlife can no longer depend on the remoteness of its range for survival.

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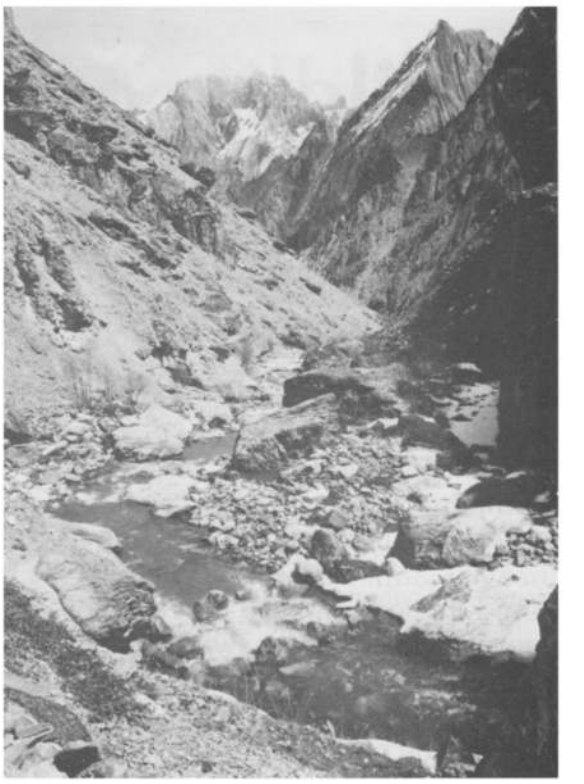
Ibex are often found on steep snow slopes in winter and dig through deep snow to find food. They are often killed by avalanches *(Ben Osborne)*.



A typical steep-sided barren valley— good ibex habitat (Ben Osborne).

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