

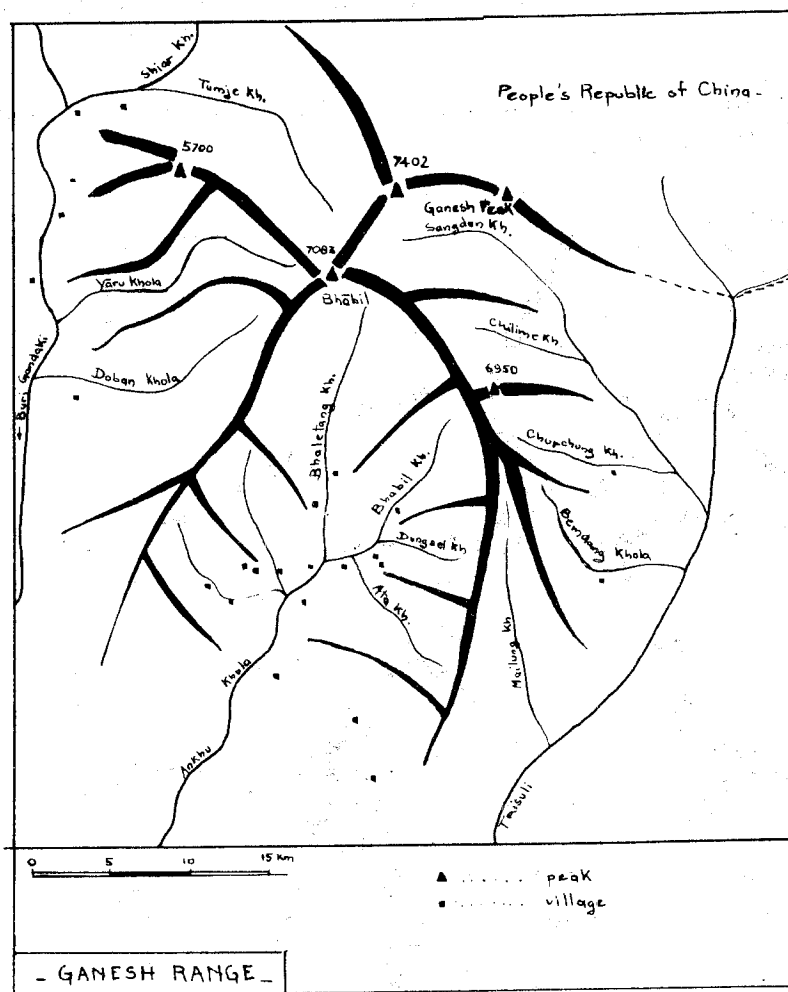
animal husbandry in the ganesh himal region: an essay in ecological synthesis

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I. The Setting of the Study

Ganesh Himal is a range of mountains to the northwest of Kathmandu, reaching an altitude of 7,402 m. The massif is bounded in the east by the Trisuli river and by the Buri Gandaki in the west. It is the source of the entire river basin which feeds the Ankhū Khola.

FIG: 1. The Ganesh Himal Region.



After trekking four days from Trisuli Bazar, one reaches the heart of the range; the upper Ankhū Khola valley. The marked contours of the ridges radiate from the the main peaks (Ganesh. 7402 m. Bhabil, 7083 m. etc.) in lines which are sometimes higher than 4,000 m. sometimes for several kilometers at a time. These ridges separate the region into distinct geographic areas; sheltered valleys (such as the valleys of the Tumje Khola, Yaru Khola, Doban Khola, Hāngang Khola, Ghattya Khola, Gandkhāni Khola, Bhāletang

Khola, Bhābil Khola, Dungsels Khola, Ata Khola, Mailung Khola, Bembang Khola, Chilime Khola, Sanden Khola²) in which the settlements lie.

Normally, access from one valley to another is difficult, nearly impossible, communication can move only along the most favored ridges, usable only in the summer by the herds of the various settlements. The topography of the area most probably set the actual pattern of settlement into the region by fixing the limits of the zones of cultural influence: Tibetan, Gurung and Tamang; one encounters three different ethnic groups in this area: Tibetan-speakers (called Bhotiya in Nepali) from the northwest or the northeast, Gurungs from the southwest and the Tamangs from the southeast.

FIG: 2. The Ganesh Himal Region Divided into Sectors According to the Physical Topography.

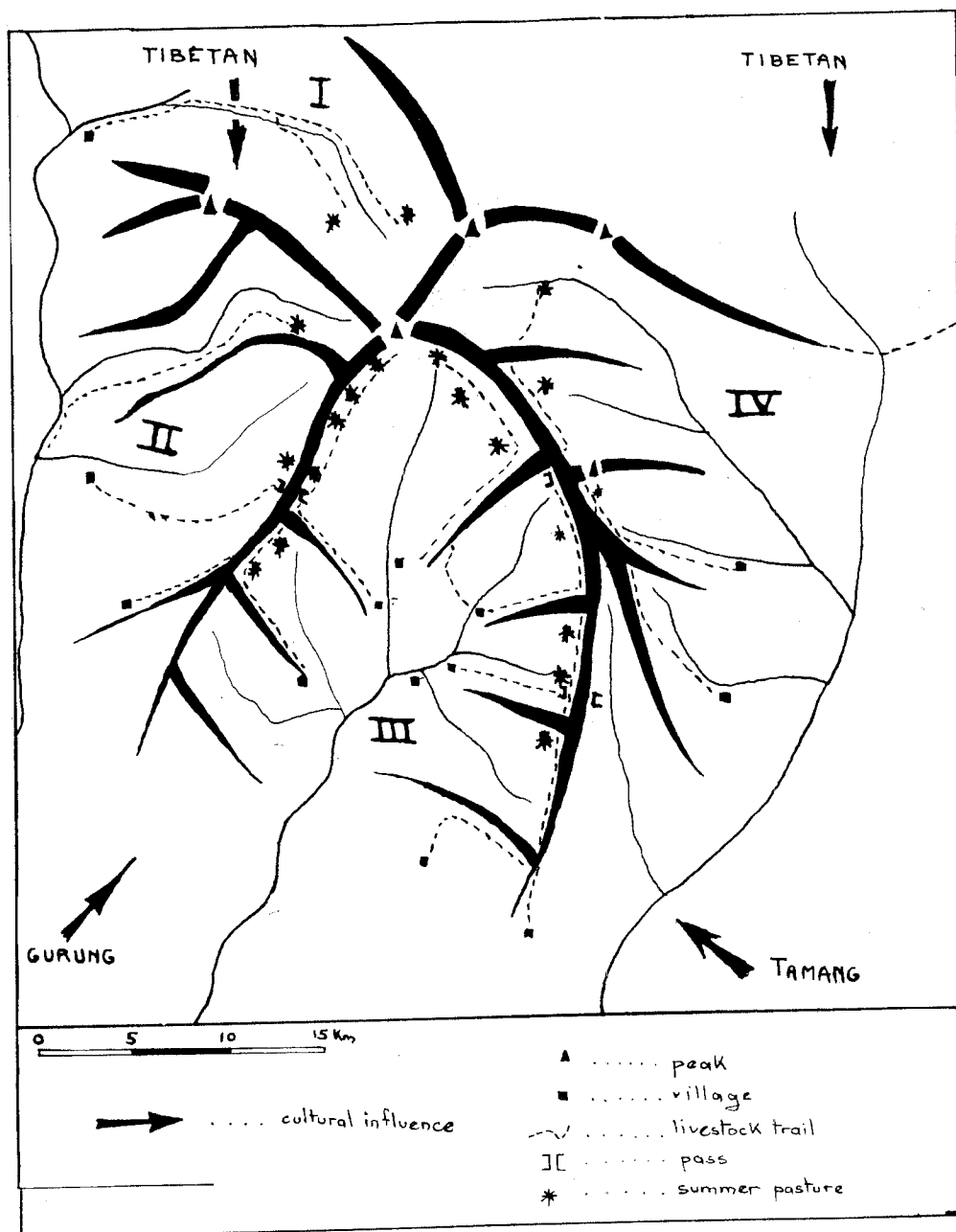


Table 1

Sectorization of the Contour Areas of Ganesh Himal Range

Region	Principle Valley	Herd Pasture Village	Ethnic Group	Max.Alt.of Pastures	Access to other Sectors
I	Tumje Khola	Ripche	Bhotiya	4300 m.	} Base of the Buri Gandaki Valley
II	Yaru Khola	Philim	Gurung	not studied	
	Doban Khola	Hulchuk Keirunja Kachigaon	Gurung	4200 m.	} 4200 m pass
III	Ankhu Khola	Laba Khading Lapchet Tir	Tamang Gurung Gurung Tamang & Gurung	4700 m.	
		Nebar	Tamang & Gurung		
		Hindung Tipling Sertung	Tamang & Ghale ³		
		Kimdang	Tamang		
IV	Mailung Khola Chilime Khola Trisuli	Salme	Tamang & Ghale	4600 m.	
		Gadlang Chilime	Tamang Tamang		
		Gholjong	Tamang		
		Combāgāng	Tamang		

One can now superimpose another dimension onto this contour relief schema, which will introduce the concept of isopotential ecological zones⁴. For our purposes, we will adopt a less detailed form of this typology, one which corresponds more closely to zones of iso-utilization than to zones of isopotentiality: We will use the following zones: high mountain, high pasture, forest and cultivated zone. The two systems correspond as follows (see Table 2.).

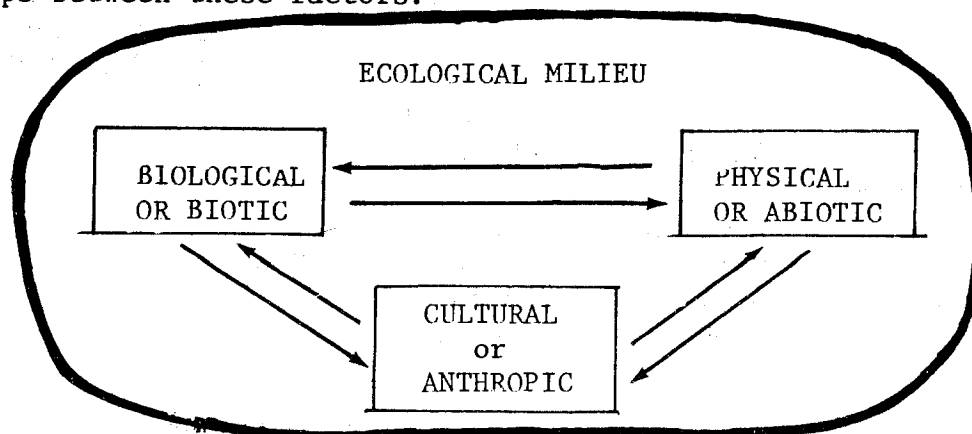
Table 2

Correspondance between Isopotential and Iso-utilization Zones

<u>Isopotential zones</u>	<u>Iso-utilization zones</u>
nival	high mountain
upper alpine level	
lower alpine level	high pasture
upper sub-alpine level	
lower sub-alpine level	forest
highland level	
hill level	cultivated zone
upper sub-tropical level	

Our purpose here is to describe some of the many features of the physical (abiotique) sphere (e.g. exposure, topography, climatology etc.) the biological (biotique) sphere (i.e. flora and fauna) and the cultural (anthropique) sphere of this region, as to discuss to interrelationships between them.

FIG: 3. The ecological milieu is determined by the combination of biological, physical and cultural factors and all the relationships between these factors.



II. The Ecological Milieu

1. The High Mountain Region (4,700 m.-7,400 m. the lower limit depending on exposure).

Here, there are numerous glaciers and the high altitude climate which dominates this zone limits access to this area from the lower zones, except for the months of July and August, and even then, only a few hunters come here looking for musk deer or kastori (Moschus moschiferus) and mountain goats or ghoral (Nemorhaedus goral). The vegetation in this zone was studied by the botanist, B. Yon, at the time of this fieldwork.

2. The High Pasture Zone (3,800 m.-4,700 m., these lower limits depend on the exposure and the degree of deforestation).

Intense cold and high snowfall limit the degree to which the zone can be utilized to the months of July and August, while the temperatures are still relatively low;⁵ the high rainfall (more than 2,000 mm.) produces a dense hydrographic network. The grazing grounds are alpine meadows and areas with rhododendrons and where medicinal plants (Swerta multicaulis, Nardostachys jastamausi, Picrorhiza scrophulariae folia) are abundant, here and there, and which are gathered in certain seasons (from July to mid-September) and sold in the commercial centers of Trisuli and Arugath Bazar. These plants represent a considerable source of income for the villagers. Despite the numerous crags and scree and the severe climate of the place, the high pasture is particularly favored for the pasturing of flocks of goats and sheep, as well as for the herds of yak hybrids. In the summer, the presence of the flocks, herds, and men drive the fauna of the region up into the highest zone. Nevertheless, one still notices many birds in the area (most often Lophophorous imperianus).

3. The Forest (2,600 m.-3,900 m., the lower and upper limits again depend on exposure and on the amount of deforestation).

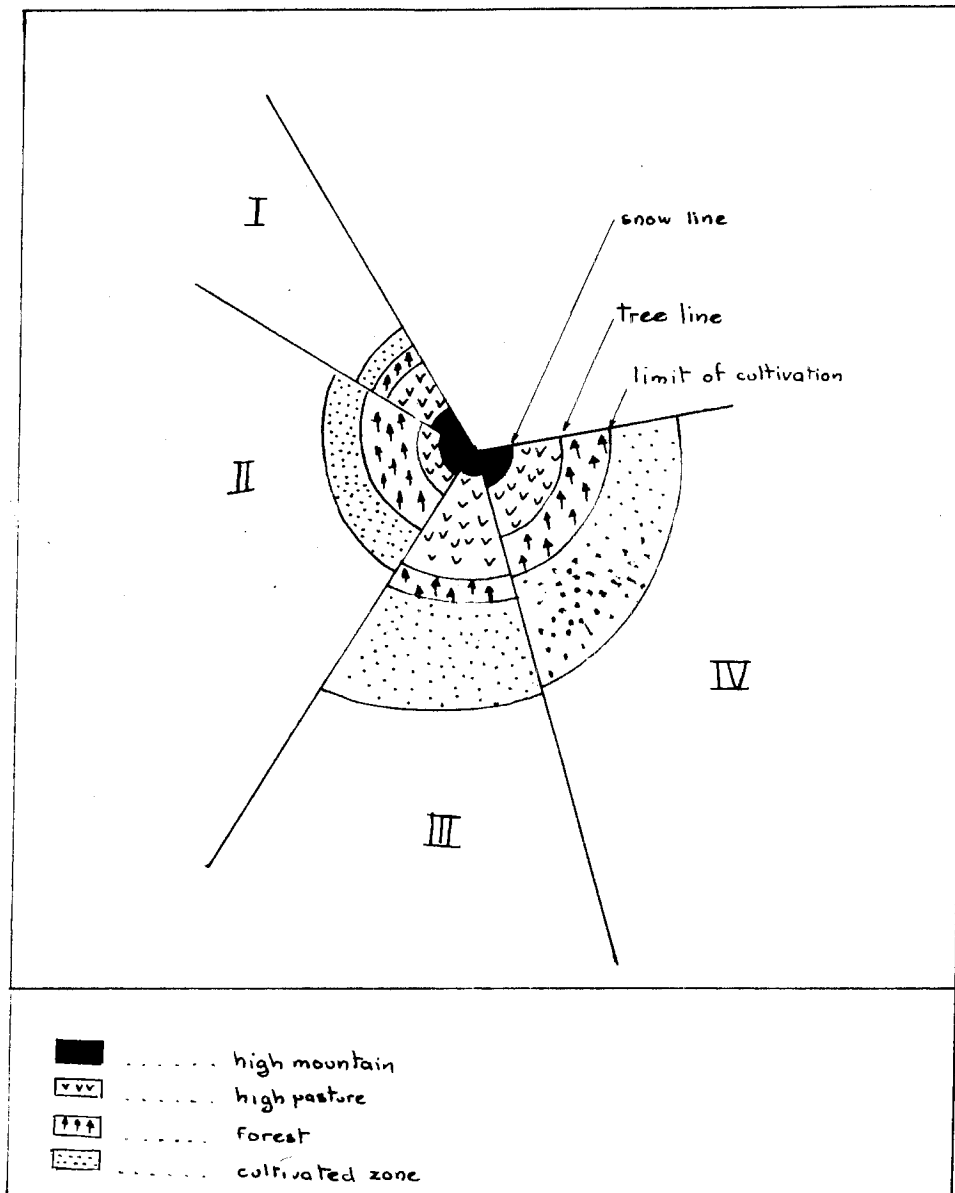
One encounters a great variety of plant species here (such as Abies spectabilis, Betula utilis, Rhododendron campanulatum, R. barbatum, R. arboreum Juniperus indica, Quercus semecarpifolia, Pinus excelsa etc.) and their ranges have been precisely described in the work of J.F. Dobromez⁶. This zone provides villagers with firewood, lumber and winter fodder. The cattle are pastured here at the time when the flocks and herds which use the high pasture are ascending in mid-June or descending in mid-September.

4. The Cultivated Zone (1,500 m.-2,600 m. the upper and lower limits of this zone depend on the exposure and the degree of deforestation).

The villagers plant their crops in this zone; terraced fields allow the soil to be worked in areas with relatively steep slopes. Maize, potatoes, wheat and barley are the principle crops and the rotation of these crops is well regulated according to an agricultural calendar. After the harvest, the animals are allowed to graze on the stubble in order to manure the fields.

One can now make a schematic drawing of the natural milieu of this area (see Figure 4).

FIG: 4. Schematic Drawing of the Ganesh Himal Region.



Before discussing the topic of major concern, that is animal husbandry, it is necessary to first precisely determine which of the elements belong to the natural milieu and which to the cultural milieu. This is because the types of animals raised depend on these factors and these alone.

III. Animal Husbandry

Flocks of sheep and goats are the most numerous domestic species in the area (around 60 flocks); we estimate there are about 13,000 head of sheep and goats pastured in the high pasture of the range. The sheep are of the baruwāl stock, characterized by short ears, a hooked nose and a rather short tail. They are of medium stature. The goats are of the sināl variety, the most common type in Nepal.

Every village has herds of cattle of the local breed, Bos taurus and Bos indicus with some zebu blood. As to the buffaloes which one sees only in the lowest villages (see Geographic Distribution below), they too are of a local variety. Herds of cross-breeds are limited in number (10 herds in the range). The composition of these herds are heterogenous. The animals are crosses between either a female Bos taurus and a male yak (Poephagus grunniens), or a hybrid female and a male yak. The genetic type of the father and that of the mother determines the type of hybrid which results.

2. The Vocation of Animal Husbandry-The Type of Husbandry and Social Organization.

The flocks of sheep and goats of the entire village are brought together for pasturing and average about 200 head in a massed flock. Each family owns from five to six sheep or goats in the flock for manure production. Sheep are bred also for wool production, as well as for milk and milk products. The animals are sheared twice a year (October and April). Each owner shears his own animals and the wool is spun into yarn by the mistress of the house or by one of the daughters. Clothes and blankets are made to take care of the needs of the family and excess wool is sold or exchanged in the village.

In the summer, milk and milk products (butter, curds and cheese) are important elements in the diet of the shepherds, while consumption is down in the villages during the absence of the sheep, because of problems of preservation and transport.

Meat is only occasionally eaten; at religious ceremonies (puja) or when an animal is accidentally killed or is the victim of disease.

The type of husbandry and social organization varies from one geographic sector to another. Most of our data has been collected from sectors III & IV (see Table 1). In these areas, we have observed the village flocks (about 40 of them). All the owners possess about the same number of animals, there are no large-scale owners. In the pastures, the sheep are not the property of any one individual, but of the village as a whole. This results in a

certain equality of rights (free pasturage on community land) and obligations among the animal owners (rotation of duty as shepherd or the responsibility to pay a permanent shepherd and the payment of the summer or winter pasturage tax on those fields which do not belong to the village).

The cattle herds are family-owned herds, made up of about a dozen animals. Cows and buffaloes produce only very small quantities of milk (the milk products being often kept only for small children: milk and butter, also in very small quantities are saved for traditional religious offerings). Bullocks are used as draught animals for work in the fields (such as plowing or harrowing). As with the flocks of sheep and goats, there are no large-scale owners. The family has complete autonomy vis-a-vis the rest of the group. The herd is never taken very far from the village, one or two days travel maximum during the yearly cycle, continual contact is kept between the cattle herds and the village.

The herds of hybrids, which we had observed (10 herds), brought together about fifty animals in an average herd; belonging to a limited number of owners. The animals are raised essentially for their milk and all of this milk is made into butter and cheese. This type of husbandry is quite different from the two preceding forms, since it has become part of the cash economy, based on the sale or exchange of milk products or young animals that do not give milk.

3. Geographic Distribution of the Various Herds

A survey of the animals in the Ganesh Himel region is presented in table 3.

Goṭh in a field (*Ph. G. Toffin*).



Table 3
Survey of Animals in the Sectors of Ganesh Himal Region

Sector	Valley	Village	Altitude m.	Ethnic Group of Village	Zone of Cultural Influence	Buffalo Herds	Cow Herds	Number of Flocks of sheep + goats in summer pasture	Number of hybrid herds in summer pasture
I	Tumje Khola	Ripche	2500	Bhotiya	Bhotiya	no	yes	0	5
II	Yara Kh. Philim Doban Khola	Philim Huichuk Rumchet Keirunja Kachigaon	1500 1510 1800 2100 1800	Gurung	Gurung	yes yes * * *	yes yes * * *	* 2 3 2 7	0 0 0 0 0
III	Ankhu Khola	Laba Khāding Lapchet Kupchet Tir Nebar	1800 1800 1800 1800 1800	Tamang Gurung Gurung Tamang Gurung Tamang + Gurung Tamang Tamang Tamang Tamang	Tamang Gurung Gurung + Tamang Gurung Tamang + Gurung Tamang Tamang Tamang Tamang	yes yes yes yes yes yes yes yes yes yes yes	yes yes yes yes yes yes yes yes yes yes yes	2 4 1 1 1 2 2 5 2 6	0 0 0 0 0 0 0 0 0 0 0
IV	Mailung Khola	Salme	1950	Tamang + Chale	Tamang + Chale	yes	yes	4	0
	Bhalche		1950	Tamang + Chale	Tamang + Chale	yes	yes	2	0
	Chilime Khola	Gadlang Chilime Choljong Gombāgāng Gre Patjhung	2300 1650 1500 2400 2300 2400	Tamang Tamang Tamang Tamang Tamang Tamang	Tamang Tamang + Bhotiya Tamang Tamang Tamang	no yes no * * *	yes yes yes yes yes *	6 1 3 1 1 1	2 4 1 0 0 0
	Barang Jharlang Linju		1500 1750 2200	Tamang Tamang Tamang	Tamang Tamang Tamang	yes yes yes	yes yes yes	1 2 3	0 0 0

* Information not available.

From Table 3 we can note the following, without prejudicing our conclusions: first, that the herds of hybrids only exist in Bhotiya zones of cultural influence and second, that the occupation of the high pasture by the hybrids at Ripche (Sector I) precludes the use of these pastures by sheep and goats, thus making it necessary for the village to use the pastures in Manaslu and Himal Chuli (the right bank of the Buri Gandaki) for the high summer pasturing of these animals.

4. The Movement of the Herds-Summer and Winter.

Each type of herd or flock makes vast, but well-defined journeys throughout the year; the kind of journey made depends on three sets of parameters: the first set brings into account the zootechnical aspects of the species of which the herd is composed (i.e. adaptation to high altitude, food needs, resistance to cold and so on); the second set depends on the environment (the possibilities and constraints brought about by the biological and physical factors, finally, we introduce the factors related to the cultural milieu (utilization of the herd by man, internal and external economic systems etc).

All of these components are not totally independent of each other and certain factors are more important than others; the aim of this work now in progress is to clarify precisely the relationships between these parameters and to arrange in order of importance these limiting factors or indices (factors which can be cultural as well as biological or physical! and which vary from time to time). Finally, the movement of the herds figures as a uniquely human solution; in this equation, some suppose that culture is the constraining factor on the possibilities permitted in the natural milieu. One can understand the significance of that statement with the help of a concrete example:

Let us take the example of goats and sheep:

Table 4 Constraints and Possibilities in Goat-Sheep Husbandry.

zoötechnic constraints and possibilities	<u>food needs</u> : little constraint (gramineous plants and leguminous plants, leaves for fodder, field stubble etc.
	<u>resistance to cold</u> : good for temperatures above 0°C.
	<u>adaptation to high altitude</u> : good in the conditions of our field area (altitudes below 5000 m.) lambing season: October-November.

possibilities and constraints both physical and cultural.

high altitudes: temperatures under 0°, snowfall, potential food near zero-except in July-August.

forest zone: high rainfall in monsoon, presence of leeches (source of sores) presence of predators (panthers and bears) small dimensions of pasturable surfaces (clearings) presence of cattle herds in July and August.

cultivated zone: cultivated fields-winter crops and summer crops make the presence of flocks not desirable in the area most of the time.

shearing: desire to have a large amount of fleece (after the summer season) presence of the flock near the village (to avoid having to transport the wool).

cultural possibilities and constraints; utilization of the herd.

manure: pasturing the flock in the fields left vacant after the harvest, mostly to replenish the manure and to avoid having to transport it.

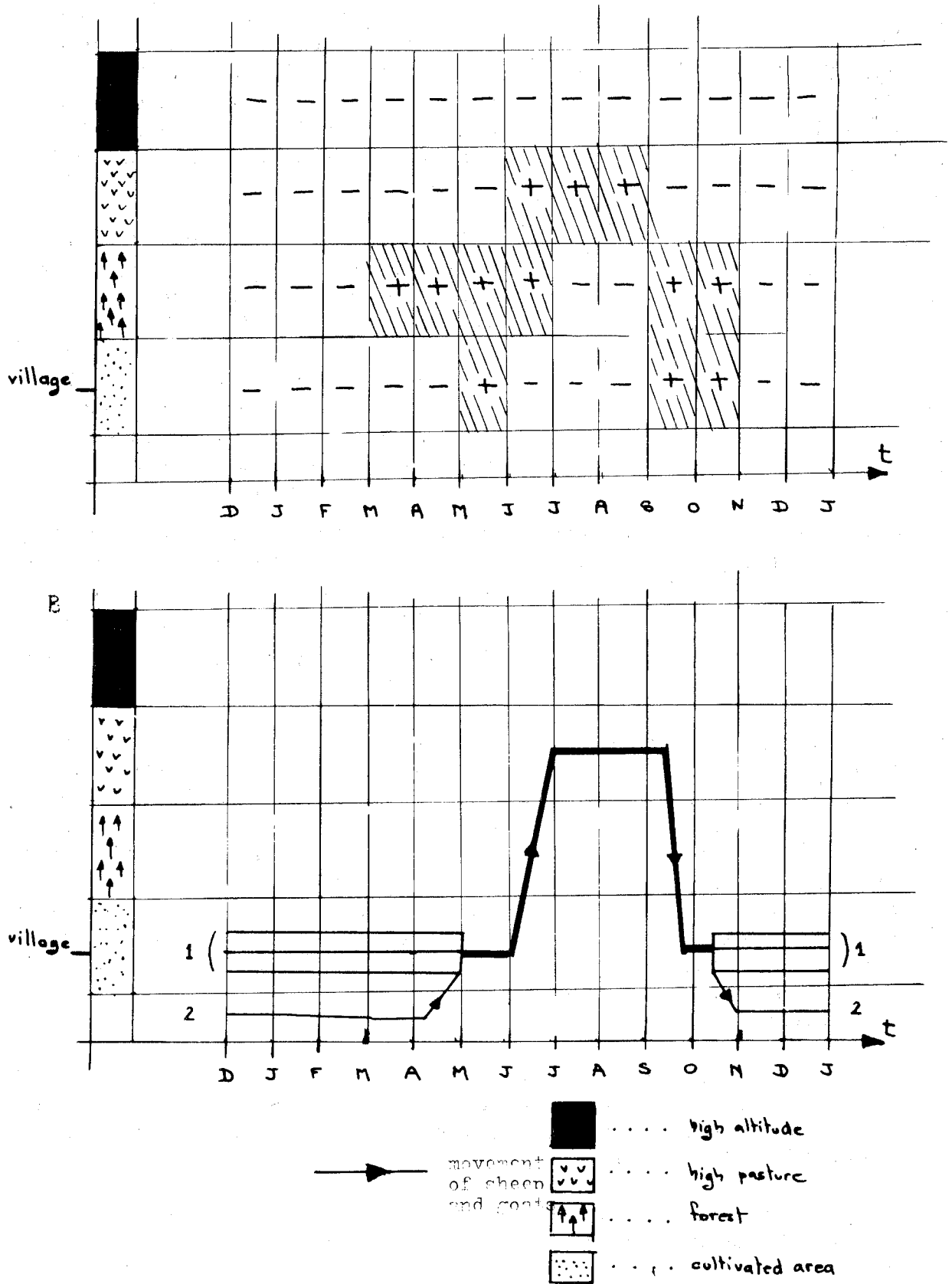
draught: milk production, maximum in June-July.

We of course haven't given an exhaustive list of the parameters which describe the features involved in this system; one must realise however, that the constraints and possibilities of the system are fixed. One can resolve the equation of the characteristics of the ecological milieu that we have studied into a graphic solution which seems most practical. The environment, during the annual cycle, seems best represented on two coordinate axes. The biological, physical and cultural factors, which are either expanding or limiting factors are represented respectively by the positive (+) or negative (-) signs of the binary language (see Figure 5).

If one compares this graphic solution, with its positive and negative signs, to the standard graph of the agro-pastoral calendar normally set down by the traditional anthropologist, one finds there is a clear correspondance.

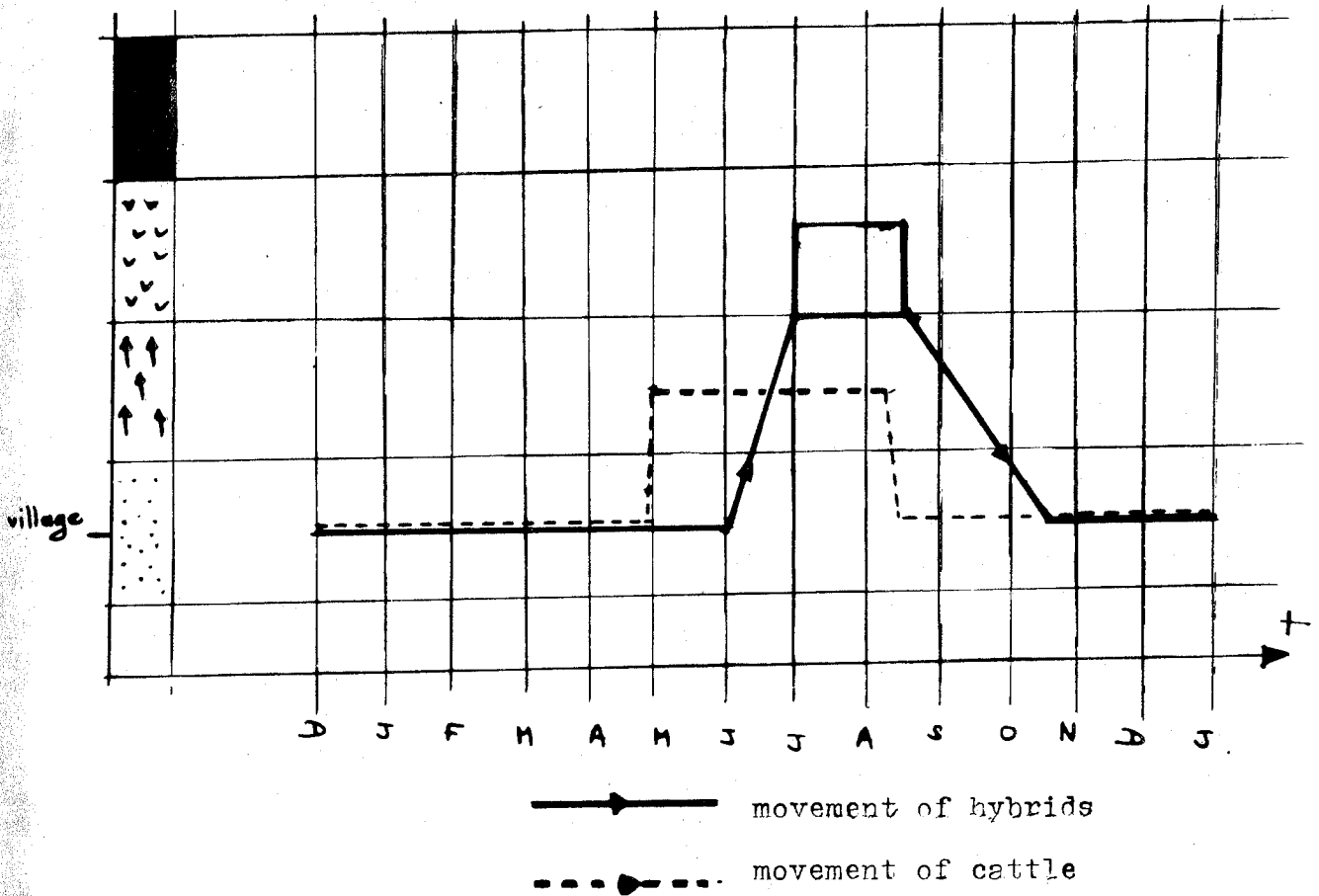
In winter, one finds there are two kinds of solutions: first the flock could be split up, each owner collecting his animals and busying himself gathering fodder for the winter supplied by the nearby forest. The animals are kept in the village area and

FIG: 5. Binary Representation of Expanding or Limiting factors (A) and Movement of Flocks throughout the Yearly Cycle (B).



outside the cultivated fields; or secondly, the flock could winter in the pastures belonging to the villages lower down in the valleys. To resume, one can say that the movement of the flocks is dominated by the constraints of the ecological milieu, man leads the movement of the flocks within the limits made possible by this natural milieu. The movement of yak hybrids and cattle follow the same rules (see Figure 6).

FIG: 6. Movement of Herds of Hybrids and Cattle through Ecological Zones throughout the Yearly Cycle in the Ganesh Himal Region.



IV. The Anthropic (Cultural) Sphere: Shepherds and Cowherds

On the average, there are two shepherds or cowherds per flock or herd. They vary in age from 10 to 65 years of age. The party is made up of a young boy and an experienced man. The first is an aide whose work entails only minor responsibility (providing supplies or leading the herd to water). The later occupies himself with the more technical operations (transport, making butter and cheese, choice of the daily pasturing place). His great experience and skill in the techniques of husbandry make him the veritable leader of the team. Whether professional cowherds or shepherds accompany the flocks or herds for the greater part of the year or whether the owners themselves keep charge of the animals for a time, the men of the high pasture must return to the village to replenish their food supply. A system of rotation allows a steady

relationship between the village and the flock, yet gives the flocks a kind of autonomy which allows for greater mobility. The shelter used by the shepherds (goth), above all answers a need for lightness (the great mobility of the flock, the distance of movement demands a shelter which is easily transportable). The wooden frame is reduced to a ridgepole beam and a few stakes, the covering is wicker-work, the roof is in the form of a half-cylinder⁷. The utensils used in the goth are essentially the same as those found in any village house, but the number of these utensils are reduced. Inside, the activity is concentrated around the hearth, here the shepherds pass the evenings and the night. The cowherds live in shelters of dry, dressed stones roofed with shale in either slabs or shingles. Technical operations (making the butter or cheese) necessitate a heavy, bulky building material, a fixed structure which is more spacious than the goth of the shepherd. The type of habitation is fixed by the necessities of the work of the shepherds or cowherds. The basic food is corn meal (mukaiko dhido) cooked in water and eaten with chili or potatoes, curds and cheese are appreciable complements.

V. Conclusions

Animal husbandry in the Ganesh Himal Range is not very different than that practiced in other ranges in Nepal. The principal interest in doing this study was to produce a model of the ecological milieu (the ecosystem). Logically, the basic geographic properties of the system (the sectorization of the physical contours) must be precisely oriented in both space and time, the definition of this precise spatio-temporal boundary is a precondition for the study of complex ecosystems. Once these boundaries are fixed and the limits of the study are set, then one can set up a model of the common features of high pasture ecosystems in general. The ecosystem is considered as the totality of its components (biological or biotic, physical or abiotic, and cultural or anthropic). The traditional anthropologist must expand his field of vision in order to encompass all three elements of this data, going into realms with which he is often not very familiar. Few can do this alone, meaning, that in the future there should be a greater dependence on interdisciplinary research. It is through the synthesis of the results obtained in this manner that one can see how the elements of the natural milieu interact thus bringing the cultural determinants of the pastoral system into greater relief. The understanding of these complex ecosystems, like high pasture ecosystems, can not be made, in our sense, without a study of both the cultural techniques and their variations tied to the constraints of the natural milieu and the diverse cultural influences.

FOOTNOTES

1/ This essay was translated from the original French by Andrew Manzardo, see also Messerschmidt, D. "Gurung Shepherds of Lamjung Himal" Objets et Mondes, Tome XIV, Fasc. 4, Hiver 1974 pp. 307-316 for a similar treatment of a nearby group of shepherds—the text is in English and accompanied by useful photographs and diagrams—ed.

2/ All geographic names in this article are taken from the map of the Survey of India: 1 inch to 1 mile.

3/ For a discussion of the Ghale as a group distinct from the Tamang and the Gurung see Toffin, G., "The Peoples of the Upper Ankhu Khola Valley." in this issue of Contributions to Nepalese Studies—ed.

4/ Dobromez, J.F., Le Nepal, Ecologie et Phytogeographie, Paris, Editions du CNRS, 1975.

5/ 7°C. in the daytime, 1°C. at night, average temperatures were recorded in the field by Allirol and Yon.

6/ Dobromez, J.F., op. cit.

7/ See Messerschmidt, D. op. cit. p. 308 for schematic diagrams of photographs of shepherd's goth—ed.

