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Frank Joseph Shulman, Compiler

Social Science and Humanities

Boord, M.J.

The Cult of the Wrathful Deity Vajrakila in the Northern Treasures Tradition of Tibet

University of London (School of Oriental and African Studies). Ph.D. 1992

This work is a study of the religious cult of the wrathful Buddhist deity Vajrakila (Tib: rDo-rje Phur-pa) as expressed in the available literature of the Byang-gter (Northern Treasures) tradition of Tibet. Divided into three parts, it is based primarily upon four volumes of Tibetan manuscripts photographically reproduced and published in recent years under the American Library of Congress Public Law 480 scheme.

PART ONE, consisting of a single chapter, outlines the religious significance of the texts and material treasures of the Byang-gter and the supposed circumstances surrounding their original concealment. It then deals, in brief, with the lineages of their transmission from the time of their rediscovery to the present day.

PART TWO, in three chapters, analyses the nature of the kila in terms of its background in Indian mythology and presents the iconography of the deified Kila (most often known as Vajrakila) as described in the ritual texts devoted to his worship. The final chapter of Part Two is devoted to 'the Kila chronicles' and their idiosyncratic exposition of the cult's history.

PART THREE, in eight chapters, examines the nature of the Northern Treasures Kila cult in detail. Beginning with a study of the available tantras, this section then looks at the rites of initiation into the cult and the way of life adopted by those yogins who commit themselves to the worship of the Kila deity and analyses their aspirations in the general context of Mahayana Buddhism.

The ritual texts contained within the four volumes upon which the present study is based are itemized in Appendix I.

Appendix II consists of a critical edition of the dPal rdo rje phur pa spu gri nag po rab tu gsang ba'i rgyud, (Black Razor Tantra).

Campbell, B.

The Dynamics of Cooperation: Households and Economy in a Tamang Community in Nepal

University of East Anglia. Ph.D. 1993

This study of a Tamang-speaking village in north-central Nepal provides an analysis of the social organisation of production focusing on kinds of inter-household labour. Historically the community's underdevelopment is related to the structure of ethnic hierarchy and the state's interest in the hinterland of Kathmandu as a labour reserve. The effects of a national park and the building of a road are examined for the impact on villagers' subsistence and commodity production. Together with these considerations, the concept of the 'household' is critically explored. Assumptions about households being self-sufficient, bounded 'units' are shown to be problematic. An approach is developed for Tamang households that stresses fluid residential dynamics and shifting boundaries of domestic inclusion. The general condition of labour scarcity is seen to favour people's extensive and diversely reckoned social networks, as well as underlying the seasonality of forms of labour reciprocity.

The analysis of economic change, involving increased commodity production, is linked to that of reciprocal labour, as the form of balanced labour exchange is shown to be compatible with calculations of cash values for labour. Labour mobilization by exchange is contrasted to that historically used by wealthy households, which calls on a more diffuse, patronage-encompassed relationship between labour and its return.

Data from a set of case study households show that on average less than half of their agricultural production is carried out simply by household members. Nearly 30% of it is accomplished through non-waged reciprocity. Some implications of these findings are worked through in a comparative review of literature on reciprocal labour in Nepal (where with some exceptions it has received little attention), world-wide, and in theories of the domestic economy.

Clarke, J.W.

A Regional Survey and Stylistic Analysis of Tibetan Non-Sculptural Metalworking, C. 1850-1959

University of London (School of Oriental and African Studies). Ph.D. 1995

The thesis examines evidence for the organization and disposition of the nonsculptural metalworking industries of traditional Tibet. In particular the work focuses on the possibilities and difficulties surrounding the differentiation of regional forms and styles. In addition to metalworking in Tibet proper the industries in surrounding Tibetanised countries have also been examined. These include parts of northern India (Kinnaur Lahul, Spiti, Ladakh), together with Bhutan, Mongolia and some border areas of northern Nepal (Dolpo, Solu Khumbu).

The work combines evidence from western sources and from former craftsmen with a typological and stylistic analysis of objects within western museums. A geographical, regional differentiation is attempted, rather than a chronological analysis, for which little reliable evidence at present exists.

Chapters One and Two posit the existence of regional styles based on particular mechanisms of patronage operating within groups of settled craftsmen. The issue of the extent to which local styles are modified by peripatetic craftsmen or the copying of exotic models by settled craftsmen is also addressed. Chapter Three defines geographical stylistic categories on the basis of variations occurring within three commonly found motifs. Chapters Four to Eight present surveys of regional industries based on the stylistic groupings outlined in chapter three.

Photographic sections accompanying each chapter present types as defined by the argument and document the comments of craftsmen on the pieces illustrated.

Coke, Priscilla Anne

Household Heterogeneity, Time Allocation, and the Use of Environmental Products: Responses to Deforestation by Rural Nepali Households

University of Washington. Ph.D. 1995. 122pp. Chairperson: Anil B. Deolalikar. Order Number DA9609617

This study attempts to better understand the time allocation decisions of rural agricultural households in response to increasing scarcity of environmental resources. For rural households increasing scarcity of an environmental product such as fuelwood is assumed to be reflected in a higher exogenous time price per unit of the good collected from the surrounding environment. It has been suggested by several sources that increasing the time required to collect fuelwood may reduce the amount of time, particularly women's time, a household allocates to productive activities such as farm labor or cooking meals. This reallocation may result in lowered agricultural production and/or household nutrition. This study attempts to ascertain whether this is the case for a sample of households in rural Nepal, and whether there are similar effects from increasing costliness of other environmental products such as fodder and water. Three issues related to this time reallocation are explored. The first is whether household heterogeneity influences how a household reallocates its time. The second is whether an increase in the time price of an environmental good with fewer substitutes is more likely to affect agricultural productivity and/or nutrition than an increase in the time price of a good with more available substitutes. The third is to determine the effect of a simultaneous increase in the time prices of several environmental goods.

Using data from the Nepal Energy and Nutrition Survey 1982/1983, reduced form demand equations for environmental products and the time allocated to several activities are simultaneously estimated. This is done first using a yearly cross section of data, then a fixed-effects model with quarterly panel data is estimated to ascertain any seasonal effects. Results indicate that households definitely reallocate time across activities and household members when environmental products become more costly and that seasonality is quite important. Households use less of the environmental products and the total time spent in their collection increases, mostly from increases in women's collection time. Negative effects on agricultural productivity and household nutrition appear to be minimal or nonexistent. Simultaneous increases in the time prices of several environmental goods frequently have a stronger impact on time reallocation than a rise in the price

of just one good. This indicates that using the time price of just one good to proxy for the effect of environmental degradation on rural households may not adequately reflect the conditions these households face.

Cutler, Nathan Storer

Mt. Kailasa: Source for the Sacred in Early Indian and Tibetan Tradition

California Institute of Integral Studies. Ph.D. 1996. 247pp. Supervisor: James Ryan. Order Number DA9721863

Early Tibetan religious history is written in terms of the Yar-lung Dynasty (7th-9th Centuries C.E.) when Central Tibetan bTsan-pos ("emperors") adopted the Buddhist faith. When this dynasty collapsed in 842 C.E. and its lineal descendants resurfaced some one hundred years later in Western Tibet, Tibetan Buddhism also experienced a renaissance. Yet it is not mere coincidence that Western Tibet provided fertile ground for Buddhism's rebirth. Before Buddhism's arrival and without its own written history, Western Tibet's contribution to the overall history of Tibet is hard to establish, but the importance of its early traditions to Tibetan religious history is undeniable.

Through the careful examination of four distinct "traditions" (as distinguished from "religions") which have deep roots in the Kailasa/ Gangs Tisé region, sources for an early tradition of Kailasa are established. Mythological and historical events are outlined which contribute to the development of a single tradition, one that cuts across sectarian differences. Further examination of two 19th Century Tibetan guidebooks (dkar chag) to the Kailasa region reveals the mountain as a rich Source, a manifestation of the Sacred, the supreme mountain among mountains acting as a source for all later traditions of Kailasa.

The presence of Kailasa as the home of all three of the great deities of Bon, Buddhism, and Hinduism demonstrates this sacred mountain's neutralizing effect as a collective place for worship and meditation. Recognizing the co-existence of these "Tisé traditions," it comes as no surprise that the ground was prepared for a highly organized monastic Buddhism to take root later on in the 11th-12th Centuries. Historical issues aside, the final revelation of the mountain's lasting and sacred power forms the basis to all the traditions—folk, Buddhist, Bon, or Hindu—and it is this sacred power that transforms the mountain into a "hierophany," a sacred source. Through the eyes of the typical Kailasa pilgrim, just as in this exhaustive study of the mountain, there are ultimately no differences, only the mountain's illuminating qualities.

Daniels, C M.

Defilement and Purification: Tibetan Buddhist Pilgrims at Bodhnath, Nepal

University of Oxford. D.Phil. 1994

Tibetan Buddhist pilgrimage places have long attracted academic interest, but accounts of the people who visit them are scant. This study focuses on pilgrims from Tibet in Bodhnath and examines how they come to assess themselves as defiled and pilgrimage as purificatory. By exploring the notions of "ordinary people like us," I identify six forms of defilement that preoccupy pilgrims, namely wrongdoing, pollution, supernaturally caused harm, inauspiciousness, ignorance and the condition of being a woman. The journey, in turn, provides a unique combination of purificatory measures that include hardship and religious practices pertaining to the body, speech and mind, as well as blessings from individuals, objects and places regarded as sacred.

The expectations which pilgrims brought with them to Bodhnath, and their attitudes during temporary residence at the site, show an apparent homogeneity of views on pilgrimage but on closer inspection this breaks down into diverse, though not competing, discourses. The result is a play between a standardized discourse and discursive practice that pilgrims termed "making use of what is to hand." Long-term residence in Bodhnath enabled me to observe the resulting ways in which they integrated, or failed to integrate, into the resident Tibetan community.

While these pilgrims invariably assess themselves as hell-bent through defilement, they simultaneously speak of pilgrimage as a happy time. In doing this, I argue, they are expressing a legacy of eschatological beliefs prevalent in the wider society. The legacy reveals attitudes to a range of everyday concerns that rule out the conception of Tibetan pilgrimage as a liminal phenomenon. Consequently, a study of Tibetan pilgrimage may tell us as much about popular concepts of gender and sexuality, for example, as about popular Tibetan Buddhist practices (D1 83,058).

Forbes, Ann Armbrecht

The Boundary Keepers: The Poetry and Politics of Land in Northeastern Nepal

Harvard University. Ph.D. 1995. 358pp. Adviser: Sally Moore. Order Number DA9609905

This dissertation examines the ways in which a farming community in the middle Himalaya organizes and understands its relationships to the land. It examines the political, socio-economic, and cultural dimensions of a 'customary' system of land tenure, kpat, in its final years of operation. The central premise is that contemporary people/land relations are

embedded in local, national and, increasingly, international cultural, political, and economic systems. Understanding these relationships requires an analysis that moves between these different levels and systems.

To hold kipat rights to the lands in Hedangna, the Yamphu Rai must be associated with a tsawa (water spring found by the ancestors) and thus be a descendant of the original ancestors. Unlike other tenurial categories in Nepal, with kipat, local connections between ethnic identity and place of dwelling embodied in tsawa are legally recognized by the system of kipat. This overlap underlies the power that kipat has had for the Kiranti into the present. If the granting of kipat marked the most extreme case of the government relinquishing control over its land and people, the end of kipat is the most extreme example of the intrusion of the central government into local affairs. It also marks the end of a political and historical rationale for the Yamphu's place of dwelling.

However, national policies are not the sole cause of the demise of kipat. There are profound political and economic divisions within the community of kipatiya in Hedangna that have also contributed to its end. While the imagined community of kipatiya provides a framework of unity, the politics of kipat turns on divisions in the community.

This study argues that this tension between unity and disunity is inherent in the kipat system and it examines the ways in which this contradiction has unfolded in Hedangna. I consider the power of the connections across land, identity and history embodied in the poetics of kipat and tsawa, and also the inequalities produced and maintained through the administration of kipat. This historical understanding is essential to understanding the changes coming to the upper Arun.

Greenberg, Brian L

An Ecology of 'Harm' and 'Healing': Agricultural Intensification and Landscape Transformation in the Western Himalayas

The University of Chicago. Ph.D. 1997. 536pp. Adviser: Raymond Fogelson. Order Number DA9720041

Many centuries of intensified cultivation in the Kangra valley of India's Western Himalayas have transformed the region's landscape and ecology. Using fieldwork and documentary evidence, this thesis illustrates how traditional agriculture was capable of bringing about such far-reaching alterations. The framework for this explanation of ecological change combines local ideas about the 'harm' and 'healing' inherent in mountain cultivation, with an historical account of the lengthy process of agricultural intensification. Archaeological and botanical data help to illustrate the scope of ecological changes driven by non-commercial subsistence agriculture.

While the thesis assembles evidence on behalf of this interpretation, it also tries to position its assessment in terms of some important alternative histories. Primary among these are local points of view, which tend to underplay the scope and magnitude of historical ecological changes. The thesis also contrasts its understanding of the pre-colonial roots of ecological change with that of the dominant post-colonial environmental discourse on South Asia. The latter usually asserts that pre-colonial subsistence systems were inherently 'balanced', and that ecological changes are the result of colonial administration or the commercialization of agriculture. The present thesis also locates the interpretive preferences of these alternatives in terms of their political and ideological commitments.

A basic understanding in this thesis is that there is accumulating evidence of global environmental deterioration. This evidence has forced a fundamental overhaul of many received notions about the inherent fertility, stability, and resiliency of nature. Underpinning the assessment of culture and agriculture offered in this thesis is the idea that a reconsideration of the moral and material precedence accorded to people vis a vis nature is long overdue. The ecological study of culture and agriculture undertaken in the present thesis evaluates human ecological relationships without an exclusive focus on human welfare. With these considerations in mind, I have tried to adopt a socio-ecological perspective which uses a broader definition of human 'social' relationships: one which incorporates our relationships with the non-human world.

Kapoor, Dip Prakash

Participatory Education and Rural Change

University of Alberta (Canada). Ph.D. 1995. 236pp. ISBN: 0315-01706-0. Adviser: Gordon McIntosh

The purpose of this study was to develop a participatory perspective on education and rural change. It was assumed that such a perspective would provide rural change agents, nonformal educators and "outsiders" with a renewed understanding of their role in rural education and change.

The study was guided by three related objectives: To examine analytically (1) the concept of nonformal education (NFE), primarily in terms of its stated purpose and prescribed role in the process of rural change; (2) the evolving concept of participation in the rural change process; and (3) the possible link between NFE and participation in the rural change process.

Development of a participatory perspective on education and rural change was viewed by the researcher as an opportunity to engage in an act of conceptual construction/re-construction (an interpretive or constructivist approach to research methodology) that was based on (1) the experiential understanding and reflection of actors (change agents) in the field and (2) the conceptual/theoretical literature on participation, NFE and rural development.

Change agents from non-governmental organizations engaged in an NFE Literacy Project in Nepal and a Community Health Project in India discussed their perspectives in open-ended interviews. This formed the basis for developing two analytical case studies. Emergent themes from these case studies suggested two different approaches to participation, NFE and rural change which are referred to as the modernization approach to rural development and the reformist approach. Themes from the two case studies were then probed and extended with the help of pertinent literature on participation, NFE and rural development by undertaking an assumptional analysis of the two apparent and emerging perspectives. The case studies and the literature-based assumptional analysis of emergent themes from the case studies formed the basis for developing the suggested participatory perspective on education and rural change—a perspective that is a blend of a desirable (normative perspective) and a possible (experiential perspective) direction for participation, education and rural change. The strength of this perspective lies in its reflexive potential (for change agents and social researchers) and in its potential for facilitating rural change.

Koirala, Govinda Prasad

Foreign Investment: Impact on Manufacturing Industries in Nepal

New York University. Ph.D. 1996. 186pp. Order Number DA9706273

This study examines the production technology and the labor productivity of foreign and local firms in manufacturing industries of Nepal. The plant level data are obtained from the census of manufacturing establishments, 1991. The analysis is supplemented by other sources, observations in location and the responses of authorities responsible for policy making towards the invitation of foreign investments in Nepal.

The results show that the foreign firms in Nepal possess differing characteristics both in terms of factor intensity and productivity per unit of labor. On the average, foreign firms possess higher factor intensity than local firms. Foreign firms also seem to have higher labor productivity. Foreign firms coming from more developed countries have significantly higher capital intensive technology than firms coming from less developed countries. In addition, larger scaled firms are found to use more capital intensive technology, and higher capital intensity is observed to be one of the major sources of higher productivity. Similarly, skill intensity is found closely associated with labor productivity.

Production function estimate suggests that Cobb-Douglas production function with constant returns to scale is an adequate model to represent production technology of manufacturing industries of Nepal. Further, foreign and local firms appear to exhibit differences in technical efficiency in a partial equilibrium set up, but when seen in a more general equilibrium framework, foreign firms cannot be said to be technically more efficient than local firms. In fact, it indicates that foreign firms may be technically less efficient. The foreign firms may have derived their competitiveness from capital intensive technology which is found to be one of the major factors to boost labor productivity.

MacDonald, Kenneth Iain.

The Mediation of Risk: Ecology, Society and Authority in a Karakoram Mountain Community

University of Waterloo (Canada). Ph.D. 1995. 357pp. ISBN: 0-61203646-4. Advisers: James Gardner; Ron Bullock

This study draws on recent work in the field of natural hazards which confronts a traditional research paradigm and reformulates the conception of a natural hazard. This work suggests that vulnerability and the extent of damage resulting from physical events are related to disruptions in the organization and structure of societies, and alterations in their capacity to effectively mediate environmental risk in everyday life. Despite the promising research possibilities of this reformulation, little work has taken it as the starting point for new studies which consider natural hazards, risk or the causal structure of human vulnerability.

Based on this conceptual framework, field research in Askole, a small agropastoral village in the Karakoram mountains of Baltistan, northern Pakistan, was conducted to examine how environmental risk is mediated in a small-scale agricultural society. The case study has several immediate objectives: (a) to examine human-environmental relations, social organization and social structure in order to identify means by which risk is mediated and vulnerability minimized; (b) to evaluate how these means are maintained and reproduced through village institutions; and (c) to provide a benchmark for evaluating the longitudinal impacts of development and modernization on the status of village institutions.

Agro-ecological practices are examined and interpreted in terms of their role in mediating locally acceptable levels of environmental risk. The ecological and social rationale behind specific agricultural and resource management practices is examined and shown to support a general pattern of risk reduction in agricultural production. Several practices combine to reduce the risk of damage to any one individual or household. These include, agro-diversity (production of a diversity of crops and livestock), dispersed field and pasture holdings, delayed planting, intercropping, polyvarietal planting, heterogeneous field configuration, and the communally regulated movement of livestock.

The risk reduction realized through rational agricultural practices is paralleled by social organization and social practices which also minimize the vulnerability of potentially marginal households and individuals. These include household composition and structure, exogamous marriage, and relationships of mutual aid based on both kinship obligations and extra-kin agreements.

These ecological and social practices are linked, maintained and reproduced through institutions of authority at the level of the household and the village. These institutions derive their legitimacy from an egalitarian politics and their grounding in the moral order of the village.

Based on this analysis, it is speculated that potential threats to the security of village residents lie in processes which could potentially confound and possibly undermine traditional institutions of authority. These include planned development activities and broader processes of modernization—particularly in the form of adventure tourism.

This study has a number of implications for hazards research. By revealing the role that ecological and social practices, social organization, and institutions play in reducing risk in a mountain community, it contributes to an understanding of the causal structure of vulnerability. By utilizing a sound combination of methodological tools, it also allows for a longitudinal investigation and periodic post audits of the status of risk reducing elements in Askole. This methodology can also be transferred to other study sites. The study also makes a significant contribution to the development of an ethno-geography of Baltistan, and provides a pre-intervention benchmark against which to assess the changes occasioned by planned development initiatives. (Abstract shortened by UMI.)

Mahmud, A.

Impact of Highland-Lowland Interaction on Agriculture in the Hunza Valley: the Socio-Economic Transformation of Mountain Societies

University of Oxford. D.Phil. 1995

This is a study of the impact of increasing external linkages on the subsistence mixed agriculture in a high mountain valley having a desert climate. The study is focused on the restructuring of agriculture in the Hunza valley, north Pakistan, in response to the increasing interaction of the valley with the southern plains.

Since the early 1970s two major events - abolition of the semi-autonomous states of Hunza and Nagar and the construction of the Karakoram Highway - have led to a rapid increase in the interaction between the Hunza valley and the lowlands. Lowland linkages are affecting agriculture both directly, by providing output markets and input facilities for the region's agriculture, and indirectly through the socio-economic and institutional transformation of the valley, which in turn has a strong impact on the structure of agriculture.

Increasing interaction with the lowlands and the resultant socio-economic transformation characterized by an increasing attraction for non-farm activities, especially tourism has caused a decline in the relative importance of agriculture in the valley. However, because of the excess of labour on farms, diffusion of labour saving techniques in farming, and readjustment of gender division of labour in the agricultural activity, little adverse effect of labour migration to non-farm activities on agriculture is visible so far.

Due to the increasing external linkages the inter-sectoral dependence in traditional agricultural system has declined. External influences have made the system more dynamic but less stable and sustainable.

In response to the new opportunities and constraints, restructuring is taking place in each sector of agriculture in the valley. There is also a strong spatial component in the process of this structural change (D 191, 047).

McKay, A.

Tibet and the British Raj, 1904-47: the Influence of the Indian Political Department Officers

University of London (School of Oriental and African Studies). Ph.D. 1995

Following Colonel Younghusband's Mission to Lhasa in 1903-04, officers selected by the Indian Political Department were stationed in Tibet under the command of the Political Officer Sikkim. This study examines aspects of the character, role and influence of these officers, whom I collectively term the "Tibet cadre," and demonstrates that the

cadre maintained a distinct collective identity and ethos, which was reflected in their approach to the Anglo-Tibetan policies, and in the image of Tibet which resulted from the Anglo-Tibetan encounter.

British India's northern frontier was the location for powerful imperial mythologies, such as the "Great Game," which were a part of cadre identity. Conditions on the frontier were believed to suit a particular type of individual, and officers of that type, capable of upholding British prestige while gaining an empathy with Tibet and Tibetans, were favoured for cadre service. A similar type of character was sought among the local intermediaries, the most successful of whom were given cadre postings.

As frontiersmen following the tradition of Younghusband, their 'founding father,' the cadre promoted 'forward' policies, designed to counter the perceived Russian threat to British India by extending British influence over the Himalayas. But Whitehall refused to support these policies to avoid damaging relations with China and other powers who regarded Tibet as part of China. The increased control exerted by central government over the imperial periphery in this period meant that, although the Tibet cadre did succeed in their primary aim of establishing British representation in Lhasa, they were unable to exert a dominant influence on policy-making either in Whitehall or Lhasa.

Palace, W.

Losing Face: the British Foreign Service and the Question of Tibet 1904-1922

University of Durham (England). Ph.D. 1995

This thesis deals with the evolution and conduct of British policy towards Tibet from the Younghusband expedition in 1904 (in itself the most extreme example of the 'forward policy' on India's frontiers in this period) to the Washington Conference of 1922 (which called for a more subtle approach to the definition and defense of essential British interests). It examines the interaction, in a complex quadrilateral relationship, of the four branches of the British foreign service primarily involved in Tibetan policy: the Foreign Office and the India Office in London, the Viceroy and the Government of India, and the China service based in Peking. It seeks to elucidate the ways in which British policymaking sought to accommodate the interests of India with the imperatives of policy towards other major powers, notably Russia, China and Japan.

Considerable emphasis is placed upon the problems and contributions of those charged with the implementation of policy 'on the spot', and the ways in which their ability to act independently (as Younghusband had done in 1904) was eroded by the increasing control of their activities by the growing official bureaucracies in London, in a world made smaller by the extension of the rapid growth of communications. Finally, the effects of the new international climate after the First World War are evaluated in terms of their impact upon Britain's Tibetan policy.

Since this thesis is primarily about the evolution of policy making within the British foreign service, it is based largely on British primary sources, both official and private, and upon the extensive memoir literature produced by the participants (DXN005,785).

Perry, O.L.

The History of the Expansion of Protestant Christianity Among the Nepali Diaspora

University of Edinburgh (Scotland). Ph.D. 1994

The history of the Protestant Christian Church among Nepali people started while Nepal was still a 'closed' country, among a diaspora community across the eastern border in Darjeeling, then a part of British India. This thesis documents the history of the expansion of Christianity throughout the Nepali diaspora as it spread to disparate parts of India and beyond. In order to trace that history, it was also necessary to trace historically the dispersion itself and its contacts with Christianity.

The first chapter deals with the basic question of 'Who is a Nepali' and the historico-sociological forces that led to widespread external migration out of Nepal. Then a two-tiered region by region historical analysis is made of the Nepali diaspora itself in the context of its receptor communities and the influence of Christianity among them, resulting in the establishment of Nepali Protestant Christian churches. This process is traced from its early beginnings in Darjeeling on through the Eastern Himalayan states of Sikkim and Bhutan and into the Duars, and along the relentless eastward migration trail into North East India and Burma. The analysis then looks at the regions to the south and east of Nepal in three broadly defined blocks: the North India plains of North Bihar and Uttar Pradesh, the Western Himalayas with emphasis on the UP hills and Himachal Pradesh, and urban India. A separate chapter documents the spread of Christianity among Gurkha soldiers, particularly within the British Brigade of Gurkhas.

Pettigrew, J.

Shamanic Dialogue: History, Representation and Landscape in Nepal

University of Cambridge. Ph.D. 1995

This thesis explores shamanic practice, history and landscape among the Tamumai (Gurungs) of Nepal. A study of the politics of cultural preservation, it examines the attempts by first-generation urban-dwellers, most of whom are Gurkha soldiers, to revalue their cultural traditions and reinterpret the understandings of their past.

Ex-soldiers are driven to repeat migration by a devaluation of their earnings while a devaluation of their "culture" has led to the founding of a cultural revival movement. This movement is based on an idea of shamanism previously under pressure from Hindu history-makers and now threatened by Buddhist lamas. The landscape of shamanic action reflects the ancient migration of the Tamu people from "Mongolia" and a central feature of the thesis is an account of a journey by the cultural revivalists into the ancestral landscape. The analysis shows that the previously Hindu-centric view of the Tamu past is now being contested by a version based on a geography which is one both of the migration route from the north and simultaneously of the shamanic soul journey. To revalue the shamanic is to support its struggle against Buddhism, as lamas are now competing with the shamans in the performance of the rituals of death.

Creating space in the landscape of the ancestral is paralleled by an attempt to create space in the town by the building of shamanic "temple" in which apprentice shamans will be trained and the tradition "saved." This is a quest which is motivated in part by the desire to define shamanic knowledge as "knowledge" that can be valued in the contemporary world of formal education.

The thesis argues that "saving culture" is, however to "change culture." The activities of preservationists are leading to the emergence of innovative and syncretic cultural forms, which have their origins in the past but their expression in the present.

Pokharel, J.R.

Identity and Synthesis of Nepali Architecture

York University (England). D.Phil. 1995

This thesis is a step towards the identification of national identity in architecture in the context of the Himalayan Kingdom of Nepal. Precisely speaking, it seeks to define the Nepali-ness of Nepali architecture, the purpose being to assimilate the Nepali-ness in the new buildings so as to arrive at a more identifiable contemporary Nepali architecture.

The thesis builds on the hypothesis that the traditional architecture is the source of identity of contemporary Nepali architecture, and that one has to acquire the knowledge of the traditional architecture of Nepal in order to be able to produce an identifiable Nepali architecture. The theory of identity and knowledge is then taken as the point of departure in this thesis. It has been deduced that identity can be maintained by retaining the essential property of the traditional architecture, while the knowledge about architecture can be obtained by its definition and design.

The thesis is then divided into two parts. The first part consists of the analysis of the identity or the definition of Nepali architecture while the second deals with its synthesis.

The method of analysis is followed for the sake of definition of architecture. Departure is made from the Vitruvian concept of the durability, commodity and beauty in its definition. Instead architecture is viewed as a physical, social and a cultural object in order to uncover its fundamental understanding. The different building types of Nepali architecture, both religious and secular, have been analyzed so as to identify their distinctive characteristics as physical, social and cultural object. The characteristics that have been found to have been common during the analysis have been identified as the Nepali characteristics.

Raoo, Qamar

Importance of Parental Involvement in Education and Six Model Programs for Bhutanese Schools

Columbia University Teachers College. Ed.D. 1994. 83pp. Sponsor: Francis A. J. Ianni. Order Number DA9606673

This descriptive study examined a probable method for improving the academic achievement of children in the kingdom of Bhutan. Evidence was presented that the literacy rate and school attendance rates in that country are low, school dropout rates are high, and parents' involvement in their children's education is virtually nonexistent.

Literature was reviewed indicating that on theoretical grounds a cause and effect relationship between parental involvement in their children's education and children's subsequent academic achievement should exist. Empirical evidence indicating that the cause and effect relationship does exist was also reviewed, together with evidence that programs to encourage parental involvement in their children's education have been used in Bhutan only on a limited test basis. Accordingly the purpose of this study was to identify those parent involvement programs in use in the United States that are especially likely to be successful in Bhutan.

Six such parent involvement programs, out of the hundreds in use in the United States, were identified. Recommendations were made for implementing those six programs in Bhutan, and for empirically testing their effectiveness in Bhutan.

Rutter, D.E.

Eating the Seed: the Use of Foods in the Structuring and Reproduction of Social Relations in a Nepali Chhetri Community

University of London (London School of Economics). Ph.D. 1993

This account of a community of Nepali Chhetris (Kshatriya) considers foods as a series of signs, purposefully selected and prepared to convey meaning to the social actors between whom food transactions take place, and hence taking a critical role in the structuring of such relationships. It examines the pattern of feeding relationships between kin and affines (including a detailed analysis of wedding rites), and reflects upon the mutual responsibility or unilateral characteristics exemplified by food interchange. The sharing and allocation of certain types of food, notably jutho, polluted leavings, and analogous remains, inaugurates and defines sexual and patrilineal relationships crucial to the sexual and social reproduction of the community: continuity as a value in Hindu (Chetri) life is reiterated through a detailed analysis of the uses of rice, curd and salt. The 'substance' of kinship is realized through feeding relationships (while birth is merely a pre-condition).

By corollary, it appears that the marginalisation of other castes in relation to the Chhetris depends upon the declining relevance of inter-caste feeding relationships as a consequence of reversal over time in the land:labour ratio. Control over productive resources, and the division of labour, in this community is briefly examined as a background to definitions of social adulthood as self-sufficiency in food production, and the meaning of food in the context of shortage elucidates aspects of social competition, scarcity and illicit circulation of food, e.g. stealing. The ethical considerations behind the transfer of food and services are considered in relation to the kshatra-dharma, as one aspect of the construction of Chhetri identity.

Food is used to define, augment and reflect the characteristics of all ritual activities. Foods - or abstention from particular foods - are the media through which abnormal states are experienced, and critical transformative rites of passage are achieved, including the passage between life and death. This research was conducted to explicate the meaning of the everyday lifeworld of returning women student teachers and to make their lifeworlds better

Schulz, Linda Zelda.

'Your Daughters are not Daughters but Sons': Field Notes on Being and Becoming a Woman Teacher in Nepal and in Canada

University of Alberta (Canada). Ph.D. 1995. 455pp. ISBN: 0-612-06282-1. Adviser: Margaret Haughey

The low numbers of Nepalese female teachers, potentially acting as role models for girls, was the entry point for me to travel to Nepal from Canada to listen to women teachers' stories that have yet to be heard. A contest over whose voices will be heard in the public debate over educational reform in Nepal has up to now evaded what a focus on "women's/girl's multiple and fragmented experience" on being and becoming a teacher calls into question. In essence, I had worked to find the opportunity to enter into the larger public domain, as intermediary, to search for my own and other women teachers' understandings and interpretations of their experiences which have been, until very recently, a significant sacrifice in the rite of passage to teaching. I have written about the experience of being and becoming a woman and a teacher with a view to "homing": that is, returning to oneself and to one's entitlement.

Sharkey, G.C.J.

Daily Ritual in Newar Buddhist Shrines

University of Oxford. D. Phil. 1994

This thesis presents an account of the rituals performed each day at traditional Newar Buddhist shrines in Kathmandu Valley. An ancillary objective is to shed light on Buddhist Sanskrit hymns (stotras), and related genres of verse, which are used in the celebration of these rituals. Though particular attention is paid to the rites at Uku Bahah (Rudravarna

Mahavihara) in Lalitpur, this report aims to provide a general understanding of the daily pujas. It includes a description of ways in which the rites vary at different venues in the Valley

Rapid social change in Nepal has led to a transformation of Newar religious practice, including the rites considered here. In addition to documenting this element of Newar devotional practice, I refer to on-going changes in the practice of these rituals and suggest reasons for them.

Earlier studies have shown that Newar Buddhists regard their practice of Buddhism as tripartite, encompassing the Sravakayana, Mahayana and Vajrayana. In their view, the dominant form of Buddhism in Nepal - the Vajrayana - subsumes the earlier and more fundamental forms of Buddhism without entirely displacing them. It has been suggested further that the daily rituals represent a stratum of primitive Buddhist practice which esoteric practice presupposes.

That claim is assessed here. The conclusion reached is that it is essentially correct, but subject to some important qualifications. The daily puja can be fairly described as a survival of Sravakayana practice, as its historical continuities with primitive Buddhist worship, and its similarity to current Theravada practice indicate (D183,879).

Sharma, Sita

Health Seeking Behavior of Tamang Women

Columbia University. Ph.D. 1997. 275pp. Sponsor: Lambros Comitas. Order Number DA9723851

This dissertation provides findings of an anthropological investigation into the reproductive health seeking behavior of the Tamang women of Talcu village in the Kathmandu district in Nepal. It provides an ethnographic account of how the Tamang women conceptualize and interpret their reproductive health in the idiom of their culture. It explores meaning and definition of sickness thus expressed and documents the use of multiple therapies in negotiating sickness. An attempt has also been made to cover impact of the on-going changes in the Tamang community on the choice of therapies. The study employs a holistic approach encompassing historical, socio-cultural and economic factors influencing health beliefs and practices of the Tamangs.

The study uses Kleinman's explanatory model and tripartite model of health care systems which focus on three interconnecting sectors and the concept of multiple therapies used by Janzen in his study in Lower Zaire. Within the popular sector, self-medication or home-based care has been studied in detail. The folk sector is composed of various alternatives. These range from religion based faith healing—rituals and practices emanating from Lamaistic Buddhism combined with Hindu rituals—to shamanism, represented by the bombos. The bombo of Talcu village are also the repositories of traditional and herbal healing, skills and practices. The professional biomedical sector consists of the services rendered by the nurses and paramedics at the village health post, by a health assistant who also runs a commercial drug outlet at the nearby Pharping Bazaar and by an Ayurvedic vaidhya.

The study is an attempt to explain that the health beliefs and practices of the Tamangs are a complex mix with roots in tradition, Lamaistic Buddhism with distinct traces of Hindu acculturation, and the influences of western medical practices. The findings indicate that multiple therapeutic practices coexist without involving the making of an exclusionary choice between the popular, folk and professional biomedical sectors. Nor do the findings suggest any definite pattern of resort. Women under study were found to seek help from the three sectors either in succession or simultaneously.

Shrivastava, Aseem

Property Rights, Deforestation, and Community Forest Management in the Himalayas: An Analysis of Forest Policy in British Kumaun, 1815-1949

University of Massachusetts. Ph.D. 1996. 352pp. Director: James K. Boyce. Order Number DA9709654

Under what conditions can one expect to see a sustained system of community management of forests in operation? Considerable theoretical skepticism has been expressed by economists and others about the viability of any such institution. In this view, such institutions will inevitably result in a "tragedy of the commons." However, evidence from around the world has accumulated in recent years which suggests that common property institutions do exist, and in some cases, have existed for a long time.

Using archival sources in India and the U.K., this thesis explores the fate of community management of forests in a region of the central Himalayas known as Kumaun. Kumaun was under British administration over the period 1815-1949. The forests of the region were not under formal state management till the 1860s. In fact, there is evidence of customary cooperative arrangements—informal local institutions—before the arbitrary takeover of forests by the new administrators. The new property regime had a disruptive effect on local institutions and precipitated much deforestation, especially since the state did not have the logistical wherewithal to enforce the new forest rules at a time when local arrangements had lost credibility.

Two schools of thought emerged within the state bureaucracy to address the emerging crisis of rapidly diminishing forests. The "centralizers" argued for more effective supervision and an increase in state power in order to protect the forests. The "devolutionists," by contrast, canvassed for decentralized management by user communities. Several decades of experimentation with centralized methods failed to protect forests effectively and caused much political protest. The government ultimately had to resurrect local institutions in the 1920s. In the beginning this was a failure, since community management had lost all credibility in the eyes of local users. However, persistent efforts by government officers finally paid off and the new system of van panchayats (village forest councils) finally solved a problem which the state, on its own, could not.

Smith, Cristine A.

Women's Acquisition of Literacy Skills and Health Knowledge in Nepal: A Comparative Study of Non-Formal Education Approaches

University of Massachusetts. Ed.D. 1997. 267pp. Director: David Kinsey. Order Number DA9721492

The goal of this dissertation is to investigate the extent of difference in effectiveness of three non-formal education approaches in helping women acquire literacy skills and/or health knowledge in Nepal, and to propose hypotheses about factors or "influences" that might explain these differences. This exploratory study provides insights that program planners, researchers and policy makers can use for focusing further research on which non-formal education program designs for women will bring about the greatest increase in literacy skills and health knowledge.

Four sample groups of women were compared: (1) 74 women in three different sites who attended monthly Mothers' Group health education meetings (with no literacy instruction); (2) 38 women in two different classes who completed a 6-month basic literacy course (with no health instruction); (3) 65 women in three different classes who completed a 6-month health/literacy course and 38 of these women who completed a 3-month post-literacy/health course; and (4) 50 women in two different sites who attended neither literacy course nor Mother's Group meetings. Data related to "acquisition" included literacy test scores and health knowledge oral interview scores; data related to possible "influences" included demographic data, and information about community and classroom context. Data were coded and analyzed by standard statistical procedures.

The findings indicate that non-formal education of any kind is effective in helping women acquire some degree of both literacy skills and health knowledge. Type of non-formal education approach was not significantly related to greater literacy skills acquisition but it was related to greater health knowledge acquisition. Participation in the integrated health/literacy course was related to higher levels of health knowledge than was participation in health only or literacy only non-formal education approaches. Participation in the post-literacy course was associated with greater literacy skill and health knowledge acquisition than participation in either schooling or other types of non-formal education at a basic level. In addition, literacy skill acquisition appeared to be influenced by class or community factors (hours of instruction, facilitator characteristics, economic status of the community) and health knowledge acquisition was influenced by individual factors (marital status, age, radio ownership, number of children).

Stash, Sharon Lynne

The Dynamics of Fertility Decision-Making among Wives and their Husbands in Chitwan, Nepal

The University of Michigan. Ph.D. 1997. 372pp. Chair: John Knodel. Order Number DA9722098

A disjunction exists between theoretical developments that highlight couple-dynamics and the role of men in fertility decision-making, and the single-sex, women-only surveys that are the basis for fertility research. This dissertation focuses on the couple as the reproductive unit and, in doing so, it addresses a persistent problem—the absence of men. Survey data offer a limited view of the fertility decision-making process, therefore extensive qualitative fieldwork and interviewing were done to augment a district-wide survey among wives and husbands (N = 1500 spouses) in rural Nepal.

The first indications of fertility decline in the study area, Chitwan District, are a harbinger of social change in less-developed regions of South Asia. Although fertility remains high, profound changes in people's fertility-related attitudes and behaviors were observed. Despite broad-based consensus on the desirability of smaller families, couples were committed to having one, and often two, sons. A test of couples' decision-making priorities demonstrates that son preference often dominates family size considerations. Husbands are even more likely than wives to pursue the birth of sons at the cost of larger families. Qualitative interviews explain son preference, and suggest the existence of a two-son norm. The birth of two sons insures families against son-loss, and promotes the long-term economic and social well-being of households. However, some couples choose to deviate from the two-son norm, in the interest of smaller families. Logistic regression demonstrates the effects of 1, 2 and 3+ sons on the adoption of permanent and temporary contraceptive methods after births during a recent 10-year period. Decisions to adopt temporary methods after one son

constitute a replacement strategy, or a sophisticated attempt by couples to preserve their potential to have additional sons if need be. Permanent methods tend to be adopted after two (or more) sons. A final analysis suggests that couples with an unmet need for family planning are differentiated from current-users by their unwillingness to use temporary methods. Because their use remains at a minimum in Nepal, as in other regions of South Asia where programs have historically emphasized permanent sterilizations, there is considerable scope to temporary methods.

Subedi, A.

A Study of Farmers' Communication Networks in Relation to the Diffusion of Innovations in the Hills of Nepal

University of Reading (England). Ph.D. 1996

The primary concern of agricultural extension services is the diffusion and adoption of improved farming innovation by farmers fundamentally through communication processes for increased agricultural production. Since the 1950's several extension approaches have been employed in Nepal and communication has remained central to the whole extension process. But the performance of agricultural extension has been disappointing. Of several factors, the appropriate communication strategy for effective diffusion of innovations among the target farmers has been lacking. Most extension approaches have overlooked the dynamism of inter-farmer communication processes that exist within a social system. The literature review reveals that in many countries farmer-to-farmer flow of information and material occurs irrespective of formal extension intervention. Such a phenomenon has also been experienced in the farming communities in Nepal. But empirical evidence seems to be lacking on how the flow of information and materials occur among different categories of farmers, particularly among gender, ethnic and socio-economic categories.

A study was, therefore, conducted in two hill villages with similar agro-climatic domains and ethnic composition in western Nepal. A sociometric survey was employed using a representative intact system of sampling encompassing each household. Using a roster of names of all the respondents in each village, data on communication relations about farming topics were collected from 422 respondents of 247 households in two villages in which 179 were males and 243 were females.

The study showed that gender (male and female) and ethnic groups (Brahmins, Chhetris, Gurungs and Kamis) have mainly horizontal communication patterns. Among socio-economic categories, most farmers of high socio-economic levels have horizontal communication while those of medium and poor categories tend to have heterogeneous communication patterns communicating mainly with farmers of higher socio-economic levels.

Thapa, B.

Farmers' Ecological Knowledge About the Management and Use of Farmland Tree Fodder Resources in the Mid-Hills of Eastern Nepal

University of Wales at Bangor. Ph.D. 1995

The thesis presents an investigation into indigenous ecological knowledge about the management and use of farmland tree fodder resources in a rural village setting in the mid-hills of eastern Nepal. The study focused upon a collection of hamlets spread over an altitudinal range of 500m to 2000m with a population of 3500 people comprising a Village Development Committee. The study focused on the indigenous ecological knowledge associated with decision making criteria used by farmers in managing their farmland tree fodder resources. Knowledge was examined relating to how farmers perceived the value of a particular fodder species and the underlying knowledge systems used by them in fodder evaluation and how farmers perceived the interactions occurring in their tree-crop-based farming systems and the underlying ecological knowledge used by farmers in managing the interactions. The knowledge acquired from key informants was evaluated in terms of its representativeness, the extent to which it was used by farmers and the extent to which it was complementary and/or contradictory to professional knowledge held by research workers operating in the study area.

The research relied upon concepts and approaches in knowledge elicitation developed in the field of anthropology and ethnography combined with a novel methodology for collecting, recording, accessing and evaluating indigenous ecological knowledge using knowledge based systems techniques. The defining feature of the approach adopted was the explicit representation of knowledge and incremental knowledge acquisition based on an iterative and rigorous evaluation of the usefulness of the knowledge already acquired. The practical utility of the approach was that once created knowledge bases could be maintained and updated as a growing corporate record of current knowledge on the topic in question. A comprehensive knowledge base on tree fodder resources was created through interviews with key informants.

The research demonstrated that farmers possessed a detailed ecological knowledge of tree-crop interactions, tree fodder quality and tree fodder management techniques which they used in formulating fodder management and feeding strategies. It was also revealed that the farmers' ecological knowledge was explanatory, predictive and of technical relevance.

Indigenous ecological knowledge research in general and farmers' ecological knowledge in particular was demonstrated to have the potential to improve the understanding that researchers have of the complex interdisciplinary field of tree fodder resources and to be used to improve the design of research and development programmes making them more responsive to the needs of the target community.

Tuffrey, V.R.

Seasonality, Anthropometric Status and Household Welfare in Rural Nepal

University of London (London School of Hygiene and Tropical Medicine). Ph.D. 1994

Two hypotheses are explored: that a 'vicious circle' model of undernutrition is a valid description of the processes leading to nutritional risk, whereby chronically low work capacity maintains a state of 'poverty entrapment'; and that small stature of adults is an 'adaptation' to environmental variation.

The 'vicious cycle' model was supported to some extent. Physical work capacity and productivity had significant associations with body size and physique. There were links between anthropometric variables and socio-economic variables for individuals and at the household level. The lack of evidence that the advantages to the individuals of greater height translated into socio-economic advantage for their household found against the model. There was little evidence to support the 'small but healthy' theory. Seasonality was a major influence on growth. The Non-Mongoloids were a nutritionally vulnerable group.

The study findings have several practical implications: Anthropometric indices can be used to identify poor individuals and households, and therefore are likely to be valuable for monitoring and evaluation of rural development projects. The anthropometric status of one to five year old children should not be used as a proxy for that of the whole community. The magnitude of seasonal anthropometric variation cannot be used to indicate severity of seasonal nutritional stress. Multi-level modeling can help identify intra-individual, inter-individual and inter-household factors which influence body size. Maximal power is a more relevant and practical measure of physical work capacity than VO₂ max. Only long-term field studies will improve understanding of the significance of adults' anthropometric indices for their households' welfare.

Zvosec, Deborah L.

Perceptions and Experiences of Tuberculosis in Rural Eastern Nepal: A Biobehavioral Perspective

University of Hawaii. Ph.D. 1996. 507pp. Chairperson: Nina L. Etkin. Order Number DA9700561

This dissertation focuses on perceptions and experiences of tuberculosis in rural eastern Nepal. I utilize a biobehavioral approach within medical anthropology to examine the interrelationships of features of the disease pathogen, *Mycobacterium tuberculosis*, and its human hosts. I first discuss the nature of tuberculosis from a Western, or biomedical, perspective, regarding characteristics of *M. tuberculosis*, the pathophysiology of the disease, and the nature of biomedical treatment and disease control. I follow with discussion of the situation of the disease within the sociocultural context of Nepali health beliefs and practices, and focus on indigenous concepts of disease process, locally emphasized symptoms and symptom constellations, and local "folk illnesses." I show how these local beliefs and practices relate specifically to tuberculosis, how they affect treatment processes, and how they impact understandings, experience, transmission, and outcomes of the disease.

Local medical beliefs and practices exist within the dynamic context of Nepali medical pluralism, such that villagers integrate biomedical concepts, treatments, and pharmaceuticals within indigenous paradigms and conditions. Perceptions and treatment of tuberculosis demonstrate the dynamics of medical pluralism, among both practitioners and patients, and local medicine as well as biomedicine are transformed. I therefore discuss pluralistic interpretations and treatments of tuberculosis and offer suggestions for health education and disease control as well as for further research. Although this research is based on ethnographic data collected in Nepal, where poverty and extreme terrain add countless economic and logistical factors to the sociocultural features to make the situation of the disease and its control uniquely Nepali, findings resonate with similar processes and problems in other nations throughout the world. Tuberculosis continues to exact high human and economic costs in developing and developed nations alike. This research demonstrates how understandings of interactions of the disease from cellular to sociocultural levels are crucial in order to effect positive change and to advance anthropological method and theory.

Natural Sciences

Chambers, A.F.

Kinematics of the Frontal Himalayan Thrust Belt, Pakistan and the External Western Alps, France

University of London (Imperial College of Science and Technology). Ph.D. 1992

Abstract not published.

Curtis, A.

Shear Wave Studies and Elastic Models of Extensional Zones: the Tibetan Plateau and Aegean Region

University of Oxford. D.Phil. 1995

The Aegean: A model of elastic strain accommodation in the crust was constructed from a smooth regional displacement field and local strain perturbations due to earthquakes using a static elastic dislocation approximation. Using geodetic measurements as constraints, inversions were performed for regional displacement coefficients. A quadratic field was found to best represent the regional displacements without fitting local effects.

By using the global $M_s - M_0$ relationship of Ekstrom and Dziewonski (1988), source moment tensors were constructed for Aegean events, and these were averaged over the north-west and south-west Aegean region. Average strain tensors were constructed from the best fitting quadratic regional displacement field over the same regions. These tensors were found to be approximately equal in orientation and magnitude suggesting that regional strain in the Aegean causes local stress accumulation which is relaxed by earthquake dislocation.

The Tibetan Region: Phase velocities of fundamental mode Rayleigh and Love waves in the period range 32-200 s were measured along all inter-event paths aligned with teleseismic GDSN or Geoscope stations. These were investigated for average shear wave velocity structure with depth, and resulting average path structures were regionalised.

The average structure for the Tarim basin exhibits low upper crustal velocities, probably due to sedimentary accumulation, and either high upper mantle velocities (> 4.8 km/s) in a layer ~ 70 km thick, or average upper mantle velocities with lithospheric thickness ~ 180 km. Either structure is consistent with the Tarim basin transmitting stress without internal deformation (D188,904).

Dransfield, M.W. Extensional Exhumation of High-Grade Metamorphic Rocks in Western Norway and the Zaskar Himalaya. University of Oxford. D.Phil. 1994.

The evolution of many orogenic belts has included a period of extension, commonly associated with large-scale, low-angle normal faulting, which with erosion, has led to the exhumation of high-grade metamorphic rocks. Structural and metamorphic studies of two high-grade terrains have been undertaken; in the Scandinavian Caledonides and the Himalaya.

The Western Gneiss Region of western Norway experienced high-grade metamorphism during Caledonian (Silurian-Devonian) continent-continent collision and was exhumed along major, low-angle detachments. Structures interpreted as resulting from horizontal shortening are preserved in eclogites and a range of structures in surrounding amphibolite-facies gneisses can be interpreted as resulting from horizontal extension, with non-coaxial and possible coaxial components. Little evidence was found for an earlier eclogite-facies metamorphism within the gneisses. There is a range of thermobarometrical results from the eclogite-facies parageneses (13.5-24.0kbar, 542-846°C) whilst the results from the amphibolite-facies parageneses are more uniform (8.0-14.3kbar, 592-668°C). P-T paths generally show a temperature decrease during decompression. A model of orogenic extensional collapse is attractive for this part of the Caledonides.

The High Himalayan Crystalline Unit in Zaskar, northern India experienced high-grade metamorphism during Himalayan (Eocene) continent-continent collision, and was exhumed along the Zaskar Normal Fault, part of the South Tibetan Detachment System. A range of structures is contained within the amphibolite-facies schists and gneisses, some of which are associated with horizontal extension, particularly near the Zaskar Normal Fault, and some of which are associated with horizontal shortening. The metamorphic isograds are truncated and telescoped by the Zaskar Normal Fault. Thermobarometrical results from pelitic schists and gneisses (4.3-5.8kbar, 621-707°C) represent a high-temperature, sillimanite-dominated metamorphic event (D 181947).

George, M.T.

The Magmatic, Thermal and Exhumation History of the Nanga Parbat-Haramosh Massif, Western Himalaya

Open University-Milton Keynes (England). Ph.D. 1994

In the western Himalaya Indian continental crust of the Nanga Parbat-Haramosh massif (NPHM) has been recently exhumed from beneath the Kohistan-Ladakh island arc. Constraints on the thermal, magmatic and denudation history of the NPHM result from an integrated structural, metamorphic, geochronological and geochemical study. The contact zone between the western margin of the NPHM and the Kohistan arc is characterized by a steeply-inclined, high-grade shear zone. In the south of the area, the rocks of the NPHM have been thrust north-westwards over Kohistan, resulting in the active exhumation of Indian continental crust. In contrast, in the north of the area, the uplift of the NPHM has been accommodated within the shear zone by dextral transtension.

The metamorphic rocks of the NPHM have mostly equilibrated under 600-750°C and 7-10 kbar, whilst those from adjacent lithologies in the Kohistan arc have equilibrated under 550- 700°C and 6-8 kbar (as determined by rim compositions). The majority of samples from both the NPHM and Kohistan record retrogressive P-T pathways, which is thought to reflect the extended exhumation history of the region. The variable results of Gibbs modeling are interpreted as indicating lithological control on garnet growth, resulting in the preservation of different segments of the same PT path. The most recent equilibration of metamorphic assemblages occurred at > 30 Ma in Kohistan and < 25 Ma in the NPHM, suggesting that contrasting structural levels can be exhumed without preserving substantial metamorphic discontinuities. $^{40}\text{Ar}/^{39}\text{Ar}$ and Rb/Sr mica cooling ages mostly lie in the ranges 1-8 Ma and 17-26 Ma for the NPHM and the Kohistan arc, respectively, confirming the recent differential exhumation of the NPHM relative to Kohistan.

The variable geochemistry of Himalayan-age granite magmatism in the region is a reflection of contrasting source compositions. In Kohistan, undeformed 30-50 Ma granitoid sheets are characterized by relatively primitive initial Sr and Nd isotopic compositions ($^{87}\text{Sr}/^{36}\text{Sr} = 0.70450.7054$; $\text{ENd}(\text{T}) = 0.1-2.7$), indicating that locally, underthrusting of relatively evolved Indian continental crust beneath Kohistan had not occurred before 30 Ma (DX179327).

Haji Abu Bakar, H.J.B. *Saccharomycopsis Fibuligera: An Organism Involved in Tapai Fermentation and Bread Spoilage.* University of Reading. Ph.D. 1995.

Twenty one strains of *Saccharomycopsis fibuligera* were successfully isolated and identified from ragi collected from South East Asian countries including China and Nepal, and bread (from the United Kingdom and Brunei Darussalam). These strains are amylolytically active, and have detectable pectinase and lipase activity. The majority of ragi and bread strains also possess alkaline and acid phosphatase, esterase, Naphthol-As-B1-phosphohydrolase, and α - and β -glucosidases activity. There is 85% or greater similarity among the ragi and bread strains as observed from the Pyrolysis Mass Spectrometry analysis of the strains, the ragi and bread strains clearly being closely related to each other.

The cellophane overlay technique for colonial growth of yeast on solid medium was found to be an effective way of eliminating substrate carry over in sample preparation for Pyrolysis Mass Spectrometry analysis. Rate of growth for *Saccharomycopsis fibuligera* was found to be greatest at 30°C and aw of 0.976. This yeast has a low saccharifying ability but both ragi and bread strains are capable of producing some maltose, glucose, ethanol and organic acids such as succinic acid reducing the pH of tapai to 3.4 during the fermentation. Major volatiles such as ethyl acetate, ethyl formate, 3-methyl-1-butyl acetate 2-methyl-1-propanol, 3-methyl-1-butanol and 2-methyl-1-butanol appeared to be produced by pure cultures of *S. fibuligera* during the fermentation of rice, probably contributing to tapai aroma.

Hutt, J.A.

Fluvial Sedimentology of the Kamlial Formation (Miocene), Himalayan Foreland, Pakistan

University of Cambridge. Ph.D. 1996

The Potwar Plateau of northern Pakistan contains one of the best dated foreland basin molasse sequences in the world. Previous detailed sedimentological work has focused primarily on the component formations of the Plio-Miocene Siwalik Group. This study investigates the sedimentology of the Early to Middle Miocene Kamlial Formation, which forms the base of the molasse succession in the southern Potwar Plateau study area. A synthesis of the structural development of the Himalaya and the characteristics of the molasse sediments provides the tectono-stratigraphic framework for sedimentological observations. The deposits are examined on a variety of scales using sources ranging from satellite images to detailed sedimentological logs. The most in-depth study focuses on a megasequence forming a 1.3km laterally continuous profile, 120m in vertical extent, which comprises a representative portion of Kamlial Formation strata.

Sedimentological analysis is based on a dual classification scheme, which combines identification of hierarchical bounding surfaces with the definition of architectural elements. The scheme, originally established by Miall (1985, 1988a), has been further developed and refined on the basis of observations made within the complex sequence of Kamliak Formation sediments. Most importantly, the classification scheme is expanded to incorporate deposits of both channel belt and overbank environments. Detailed analysis of Kamliak Formation strata, including paleocurrent and provenance trends, provides the means for an evaluation of the environment of deposition of the Kamliak sediments and an assessment of the dominant controls on the Kamliak fluvial system.

This study proposes that the major Kamliak fluvial system comprised an avulsion driven, basin-axial, braided river system, comparable in scale and sedimentary characteristics to the modern day Brahmaputra River, as described by Bristow (1987, 1993). Drainage derived from a paleo-high located to the south of the floodplain, in the region of the present day Sargodha High-Salt Range, is recorded by the development of a northwards-directed tributary system, which fed into the basin-axial channel belt. By incorporating this interpretation into existing theories regarding development of the Siwalik strata, an integrated model for the evolution of the foreland basin fluvial system throughout the Neogene is obtained.

Jehangir, S.

Modeling the Hydrological Impacts of Land Cover Change in the Siran Basin, Pakistan

University of Leicester. Ph.D. 1995.

A deterministic model based on high resolution spatial and temporal data offers the ability to simulate the hydrological impacts of changes in land cover in a spatial context. In an attempt to assess the impacts of changing forest covers on individual hydrological processes, a GIS-based model Siran_HYDMAPS has been developed for the Siran Basin, Pakistan.

This model integrates the spatial databases with the well-known hydrological process algorithms (e.g. Penman-Monteith evapotranspiration and Green-Ampt infiltration models). Spatially distributed static (topographic and soil) parameters for this model are extracted from a regional GIS developed specifically for the project. The dynamic (vegetation-related) parameters are estimated from the land cover maps, derived by digital processing of multi-resolution multi-temporal Landsat MSS (5.3.1979) and TM (10.7.1989). Relative relief and shadowing in rugged terrain of the Himalayan foothills, that cause major problems in image processing, have been given particular attention.

A rule-based approach was adopted to refine land cover maps with the integration of GIS for mapping the level 1 forest classes. Mapping of forest cover changes was carried out by post-classification change detection techniques. The Siran_HYDMAPS predicts a decrease in radiation balance and interception capacity, and an increase in evapotranspiration and catchment response of the Siran Basin, as a result of land cover changes. It was concluded that the water imbalance in this catchment, observed during the last two decades, were caused by the integrated effects of land cover changes and climatic factors.

Mahato, S.N.

Epidemiology and Pathogenesis of Fasciolosis in Eastern Nepal

University of Edinburgh (Scotland). Ph.D. 1994

In part one, epidemiology of fasciolosis in eastern Nepal, a 19 months field survey on the epidemiology of fasciolosis is described. Four *Lymnaea* spp; *L. auricularia race rufescens*, *L. auricularia sensu stricto*, *L. viridis* and *L. luteola* were identified. *L. auricularia race rufescens* was the predominant species. The snail's main habitats were spring or stream fed rice-fields, irrigation channels, ponds and road-side pools. The monsoon rains and rice cultivation practices contributed to the creation and expansion of the habitats. The snail population density was high during the dry period and declined with the onset of the monsoon. Snail egg masses and young snails were observed throughout the year. Mature *Fasciola* spp infections were found in the hills from May to February and throughout the year in the Terai.

In part two, experimental studies on pathogenesis of fasciolosis with special reference to its effects on productivity of ruminants is described. Monitoring included clinical, parasitological, haematological, biochemical and pathological observations. Pilot comparative studies in Scottish Blackface and Suffolk cross sheep conducted in Edinburgh indicated that *F. gigantica* was more pathogenic than *F. hepatica*. In another pilot experiment in Nepal using local Baruwal sheep it was also found that very low infections with *F. gigantica* caused measurable production losses. Pathogenesis in goats was investigated using Nepalese hill goats. Infection caused production losses including weight loss. Burdens of more than 1.3 flukes/kg of initial liveweight produced clinical chronic fasciolosis.

In part three, the relative merits of the current methodologies for speciation and differentiation of *Fasciola* spp. are reviewed. The development of species-specific (MHFh and MHFg) and cross-reactive (MHFx1 and MHFx2) DNA probes

for the identification of *Fasciola* spp. are described. If used in conjunction these probes clearly differentiate *F. hepatica* and *F. gigantica*.

Massey, J.A.

Metamorphism, Melting and Fluids in the High Himalayan Crystallines, Langtang Valley, Nepal

Open University-Milton Keynes (England). Ph.D. 1994

The Langtang Valley exposes > 15km of high-grade metamorphic and anatectic rocks (The High Himalayan Crystallines, HHC). Metamorphism within the HHC is 'inverted', with kyanite-grade rocks at the base over-printed by sillimanite-grade migmatites at high structural levels. Both metamorphic events reached > 700°C but pressures differed from 8-10kbar (kyanite) to 4-6kbar (sillimanite).

Five units, distinct in petrography, 87Sr/86Sr and $\delta^{18}\text{O}$ constitute the Langtang HHC. The length and complexity of deformation history is greatest in the upper units. Kyanite-zone foliation development predates peak metamorphism, and post-metamorphic deformation which continued beyond peak conditions, and down to chlorite-grade in the topmost units. The kyanite-sillimanite isograd, and hence metamorphic 'inversion', is tectonic in nature.

Fluid-rock interaction increases up-section. Kyanite-zone mineral 18O/16O fractionations record temperatures within error of those derived using thermobarometry, requiring anhydrous, closed-system cooling. In sillimanite-migmatites, oxygen-isotopes were mobile until ~600°C, when melts crystallized and/or deformation ceased. At the highest structural levels, calc-silicate and gneiss $\delta^{18}\text{O}$ values are inconsistent with closed-system cooling, requiring exchange with an external fluid. Centimetre-scale depletions in 18O along brittle fractures record late-stage meteoric fluids.

Two granite types exist in Langtang. The earliest intruded as foliation-parallel, micaceous granites, geochemically distinct from typical High Himalayan Leucogranites (HHL) and deformed with the surrounding gneisses. Later, generally tourmaline-bearing granites, with typical HHL chemistry, post-date all but the latest deformation. $\delta^{18}\text{O}$ and 87Sr/86Sr data indicate that both granite types were derived from rocks equivalent to those exposed in the kyanite-zone, and not from observed migmatites. The required melt transport supports fluid-absent melting.

Munir, M.A.

Systematics and Biology of Phlebotomine Sandflies of the Visceral Leishmaniasis Foci of Northern Pakistan

University of London (London School of Hygiene and Tropical Medicine). Ph.D. 1994

The aim of this study was to incriminate the vector(s) of visceral leishmaniasis in Northern Pakistan. Two contrasting disease foci were studied: Azad Jammu & Kashmir (AJK) and Northern Areas (NA) through monthly sampling.

Studies on the systematics defined morphologically variable species of the subgenera *Phlebotomus* (*Larroussius*) and *P. (Adlerius)*. Morphological characters of all the species belonging to these subgenera were intensively studied. The species belonging to the subgenus *Phlebotomus* (*Larroussius*) were identified as *P. major*, *P. keshishiani*, *P. kandelakii burneyi* and *P. sp. A.* and those belonging to subgenus *Adlerius* as *P. hindustanicus* and *P. salangensis*. Species belonging to other subgenera: *P. (Phlebotomus) papatasi*, *P. (Paraphlebotomus) sergenti* and *P. (Paraphlebotomus) alexandri* were easily identified.

The longitudinal entomological studies were carried out in Bagh district (Rehra village) in AJK and Chilas district (Hudur village, 1200m and Thor village, 1700m) in Northern Areas between April 1991 and November 1991 and in the same months in 1992. Sampling was done using CDC-light traps, sticky paper traps and mouth aspirators. In addition, a general survey was also undertaken at higher altitudes in Northern Areas and AJK.

A total of 9656 *Phlebotomus* sandflies were collected (8797 during the longitudinal studies and 856 during the general survey). Nine species of *Phlebotomus* were found, *Phlebotomus (A) salangensis* for the first time and a new species *P. (Larroussius) sp. A.* The species composition and relative abundance of species differed within and between the two areas. In Northern Areas *P. papatasi* (35.75%) followed by *P. sergenti* (19%) were dominant at the lower altitude of Hudur village but *P. keshishiani* (29.66%) was most abundant at the higher altitude of Thor village, whereas in AJK, *P. hindustanicus* (64.62%) was predominant.

Najman, Y.M.R

Evolution of the Early Himalayan Foreland Basin in N.W. India & its Relationship to Orogenesis

University of Edinburgh (Scotland). Ph.D. 1995

The Himalayan mountain chain formed between 65-40 Ma due to the closure of the Tethyan ocean and the subsequent collision of the Indian and Eurasian plates. This collision and continued plate convergence resulted in crustal thickening, southerly propagating thrust stacking, and two main periods of Barrovian metamorphism: an early 'Eo-Himalayan' metamorphism and a later Himalayan metamorphism, synchronous with a major period of thrust stacking at ca 21 Ma. Formation of the orogen loaded the Indian plate and caused downwarping and development of a foreland basin to the south.

The sedimentary rocks within the foreland basin are the Subathu Formation of Palaeocene-Mid Eocene age, the Dagshai Formation of Upper Eocene-Oligocene age, and the Kasauli Formation of lowest Miocene age. These sediments form a conformable stratigraphic sequence. The Subathu Formation sediments are marine deposits, consisting of dominantly mudstones in the lower part of the succession, with limestone becoming more prominent higher up. Terrigenous material is present in minor amounts. The Dagshai Formation sediments are clastic red beds, with mudstones dominating at the base of the sequence and sandstones increasing in proportion higher up the succession. They are interpreted as being of continental origin, laid down under semi-arid conditions in a distal alluvial fan and meandering fluvial setting. The Kasauli Formation sediments are dominantly grey sandstones. Like the Dagshai Formation, they are of continental origin, but the climate had changed from semi-arid to humid by that time. The Kasauli Formation sediments are interpreted as being the product of deposition in a braided fluvial, alluvial fan environment. After deposition, the sediments were incorporated into a southward propagating imbricate thrust stack. The early foreland basin sediments are now found at three structural levels within the thrust stack; the highest structural level restores furthest to the north while the lowest structural level restores furthest to the south.

Oli, M.K.

The Ecology and Conservation of the Snow Leopard (*Panthera Uncia*) in the Annapurna Conservation Area, Nepal

M.Phil. thesis. University of Edinburgh. (Scotland). 1992

Abstract not published.

Sheikh, R.A.

Deposition and Diagenesis of Mesozoic Rocks Kalachitta Range Northern Pakistan

University of London (Imperial College of Science and Technology). Ph.D. 1992

The Mesozoic sequence of the Kalachitta Range is generally represented by carbonates with minor assemblage of siliciclastics. This sequence was deposited on the passive continental shelf of the Indian Plate in the NeoTethys, which was interrupted by four regional breaks in sedimentation. These breaks in sedimentation played a significant role in the diagenesis of the Mesozoic formations.

The faunal and lithologic assemblages of the Triassic and the Middle Jurassic carbonate rocks indicate shallow shelf marine environments. The Middle Jurassic carbonate rocks (Samana suk Formation) contain some hardgrounds with shallowing upward sequences without evaporites. In the Middle to Upper Cretaceous relative deepening of sea water occurred during the deposition of the Chichali Formation (siliciclastic) and Kawagarh Formation (Carbonates and marls).

The Mesozoic carbonates are generally dolomitized and in places dedolomitized. Conventional and cathodoluminescence petrography and S.E.M. studies (including wavelength and energy dispersive systems i.e. WDS and EDS) revealed that dolomite crystals possess compositional zoning representing changes in the pore water chemistry. The dolomitization is of multigenetic origin: however Mixed water Model dominates.

The relationship between secular variation of the conical mineralogy and original mineralogy of the ooids seems doubtful. This is also true for the original mineralogy of the faunal grains/shells which is controlled by their evolution.

X-Ray diffraction (Powder method) was used to determine the average mineralogical composition and I.C.P.-A.E.S was used to detect the average trace and minor elements.

The whole Mesozoic sequence together with younger rocks was later subjected to tectonic overburdening related to the thrust imbricate structure and folding. This has resulted in the formation of stylolites in suitable rocks. These stylolites disrupt earlier veins filled with sparry calcite and caused a reduction in thickness particularly of the Samana Suk Formation.

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Frank Joseph Shulman