

# A Brief Note on the Seminar on High Mountain Archaeology of Nepal

(held at Kathmandu on March 9, 1993)

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A seminar on 'High Mountain Archaeology of Nepal' was organised in Kathmandu jointly by HMG/N Department of Archaeology, and Nepal-German Project on High Mountain Archaeology on March 9, 1993. Papers were presented by the German as well as the Nepalese scholars. Only some papers are published in the Journal of the Department of Archaeology, *Ancient Nepal* (No. 130-133, June-January 1992-93) and the issue was distributed in the seminar.

The papers presented in the seminar by the Nepalese scholars are not published in the journal except the foreword entitled *A Few Words* by Mr. Khadga Man Shrestha, Director General of the Department of Archaeology. Nepalese Scholar Mr. Chandra Prasad Tripathi presented his paper on "Archaeological Excavation in Khingar and Dzarkot," which is also not included in the published journal. But we can hope that all the papers will be published in the future.

Many seminars on Nepalese cultural heritage have been organised previously, but it was the first time that the seminar on prehistoric archaeology of Nepal was conducted. No such seminar was held in the past. Therefore, it was very remarkable and important. The papers presented by the German

scholars were new in this field except for a few papers on anthropology.

The materials given in the papers were not surfacial but were based on developed scientific approach and analysis. The papers as such were significant not only to Nepal but also to the world. This point was also noted by Prof. Dr. Dieter Schuh in his introduction. Presented seminar papers were only preliminary reports on archaeological explorations and excavations that were done in Nepal to date. We can hope that valuable informations will be available in future with the final reports.

The field of archaeology is classified into two parts: historical archaeology and pre-historic archaeology, but to classify it more clearly, we can divide it into three parts: historic, proto-historic and pre-historic. As for example, the history of Nepal goes back to the period of Lord Buddha on the basis of inscriptions on Ashokan pillar found at Lumbini and Kapilavastu (Niglihawa). The period upto Lord Buddha is called historic period whereas the periods previous to that should be called proto-historic and pre-historic periods. The Nepal-German Project on High Mountain Archaeology is concerned more on the pre-historic period and to

some extent historic too.

Prof. Dr. Dieter Schuh in his introduction had remarked that Mustang civilisation may be more than 6,000 years old, and the exploration will greatly enhance the prestige of Nepal as a cultural nation which created one of the oldest highly developed civilisations in the world. The writer has not written these words just to please the Nepalese people. Whatever he has written is based on scientific exploration.

The oldest pre-historic human settlement in the world is Jericho in the Jordan Valley. Although Dr. Schuh had not mentioned Jericho, I have the opinion that he had tried to compare the culture of Mustang with that of Jericho.

Let us see why Dr. Schuh has given so much importance to Mustang. Toni Hagen in his famous book entitled Nepal has included a Photograph No. 38 under the caption reading as "*Deserted Cave Dwellings in the Extreme North of Nepal*", with also a short note as: 'innumerable such deserted caves are found in Thak Khola, to the north of Annapurna and Dhaulagiri. Mostly they were formerly monasteries, some of which especially easy of access, are today the abode of Buddhist Lamas. Possibly these caves also served the local population as protection from the marauding attacks of robbers from the north'. This note will give only a general idea about the matter in question.

The geological structure of Mustang area is very important for a geologist. Dr. Chandra Kanta Sharma, a well known geologist of Nepal, has studied this area to a considerable extent. According to him the geological features of this area are as follows:

"Tectonics : Fractures in the Tibetan slab having N 35° E are related to a fracturation schistosity and are posterior to the main tectonic phase and responsible for the formation of the late structures

like Thak Khola trench".

About the top of the Tibetan slab he writes, "The tectonic discontinuities just above the augengneiss and Tibetan slab became recumbent fold (Manang synclinorium, Gangapurna, Nilgiri and Dhaulagiri) affecting whole of sedimentary sequences from ordovician upwards". On the other hand, he writes, "Western Nepal encompasses the area between the Karnali and the Gandak River. This area is highly interesting for geologists as it contains the stratigraphic and the tectonic features of both the eastern and the western Himalayas. Gondwana formation which is found to occur sandwiched between underlying the Main Boundary Thrust and overlying metamorphics is also found in the Tansen area and the Western Himalayan features of Eocene horizon also overlaps in this zone. In the northern area particularly in Thak Khola one can study the Tethys sediment in the Thak Khola graben. The sheet of Himal gneiss continues parallel to Himalaya in NW-SE trend from the eastern to western Nepal". (C. K. Sharma, *Geology of Nepal Himalaya and Adjacent Countries*, pp. 231, 237, 1990 A.D.).

Dr. Sharma has raised the question of Tethys sediment of Thak Khola. The study of Tethys sediment is new to us. It will be interesting to have some idea about Tethys.

"Tethys sea which lay between Laurasia and Gondwanaland, two super continents which were formed by the first split of the ancient super continent PANGAEA. It was the site of a large Mesozoic Geo-syncline which was later elevated into the Alps and the Himalayas".

The field of archaeology is related to geology, zoology and botany also. As it was largely by means of geological evidence that man's antiquity was established, it is not surprising that geology remains essential to relative dating, and stratigraphical methods for establishing

archaeological sequences are derived from geological practice. In addition to geology, prehistorians have drawn the natural and physical sciences for information essential to sketch a complete picture of man's past.

It is obvious that the enormous range of geological time must be subdivided. The initial four major divisions, viz., Primary, Secondary, Tertiary and Quaternary, are further subdivided, each subdivision being characterized by special fauna or special formations.

If we accept that the principle of evolution applies to man as well as to other creatures, it is possible, at least in theory, to trace all living things back to simple, unicellular organisms, almost at the beginning of geological time. As we are dealing with man's immediate ancestry, we need only concern ourselves with the last two major geological divisions, the Tertiary and the Quaternary or Pleistocene. During the former period of geological time, man's physical development began to take definite shape, while during the latter, his cultural development took place.

The exact duration of the Pleistocene is still not known for certain; it ended sometime around 10,000 years ago. For a long time geologists estimated its duration as being about 600,000 years, but recent evidence suggests something nearer 2.5 million.

About high altitude cave-settlements in Nepal Prof. Dr. Dieter Schuh writes in his introduction : "A part of the population of Purang lives also in cave dug into the conglomerate walls of hills which are made into regular houses by the construction of walls and gates in the front side. Some caves are even two or three-storeyed high."

"If we remain in an area of the same altitude as Purang but turn to the west for about 300 km into the territory of Nepal, we reach the area of the Kali

Gandaki river in the Mustang district in Nepal. Here in a similar environment we again find huge systems of cave settlements. These settlements were observed and briefly described by G. Tucci and other scholars."

After G. Tucci, Mr. Toni Hagen (1961) and other scholars have also described the cave system in Mustang area. Mr. H. Danial Gebauer has given some note in his book named *Caves of India and Nepal* (1981/82, pp. 76).

One of the highly appreciable articles published in *Ancient Nepal*, (No. 130-133 June-January 1992-93), is "Trial Excavations of a Cave System in Muktinath Valley" by M. Angela Simons. This article is very important to Nepalese archaeological history. She has given sufficient carbon-14 data. Carbon dating is the little known method in the field of Nepalese Archaeology.

The major advance in the search for absolute chronology came from the field of atomic physics and was pioneered in America. The various techniques generally known as radiometric dating depend on the known rates of decay of a radioactive isotope, or the replacement of one isotope by another, also at a known rate. The first of these techniques to be applied to archaeology is generally referred to as carbon-14. In principle all living organisms absorb the radioactive carbon isotope from the atmosphere. When an organism dies, the carbon isotope is no longer absorbed, and what is already inside the organism begins to decay. As we know the rate of decay, the date of death of the organism can be calculated on the basis of the amount of isotope remaining. Obviously, the longer the time involved the less to measure, so that a point is reached where there is either too little to measure or nothing at all.

Recently, enrichment techniques have been developed which give reasonable result for quantities originally too small to calculate, thus extending the time scale. So far, dates of about

4000 - 50,000 years are possible. There is however, a margin of error which increases as the date gets older. A variable factor of about 200 years is not very serious in a date of about 20,000 years, but would make a medieval date pretty useless.

Only a limited number of materials from archaeological sites are suitable for carbon-14 dating - charcoal from hearth, bone, antler and shell, the last being the least suitable as a considerable quantity of material is required to give an acceptable result.

M. Angela Simon's article is very useful to carbon-14 dating data of Mustang area.

The next article published in the same journal is "Dendrochronological Research in South Mustang." This article is also very useful to Nepalese Archaeology. Dendrochronological research is done for the first time in Nepal, particularly in the field of archaeology. Dr. Schmidt has given a number of data about dendrochronology of Mustang area, Europe and America also.

Dendrochronology is a method of dating past events by the analysis of tree rings. The system is based on the fact that as the climate varies, so does the thickness of the rings which a tree produces each year. By matching variation in the rings with samples taken from fossilised tree remains found on archaeological sites in the areas subjected to the same climatic conditions, the data of the remains can be established.

Dendrochronology was first developed in the USA in 1929. More recently, using the tree rings from the Californian bristle-cone pine - the world's oldest living tree - a long series of the tree-ring dates stretching back about 6,500 years has been prepared. This development has had important consequences. It has shown that at this early period much more carbon-14 occurred naturally,

and so suggests that dates established by RADIO-CARBON DATING are generally too late.

In the field of prehistoric archaeology pollen analysis is also very important. Pollen grains have extremely tough, often intricately patterned outer walls, and these walls may remain intact for thousands of years. Most plant genera, and some species, have their own distinctive pattern, which may be used for purposes of identification. These characteristics make pollen analysis a particularly useful tool in reconstructing the flora of prehistoric time, when most other aspects of the vegetation have decomposed.

Similarly, in the same journal we find other articles like "Important Trade Routes in Nepal and their Importance to the Settlement Process" by Dr. Rainer Grafen and Christian Seeber and "A Ritual of Political Unity in an Old Nepalese Kingdom" by Dr. Niels Gutschow. These articles are very important in the field of Nepalese archaeology as Director General Mr. Khadga Man Shrestha suggests in his "*A Few Words*".

Prof. Dr. Dieter Schuh has made a note in his introduction that "The actual field work will be done and supervised by the two young Nepalese archaeologists and two young German archaeologists. The persons concerned still have to be selected. As far as the young scholars from Nepal are concerned, it is planned to provide an extra training for half a year in archaeological fieldwork in Germany .... Moreover, it may turn out to be useful to use the help of trained students in the field of archaeology, from Nepal and Germany for limited periods."

It will definitely benefit Nepal in the field of archaeology. But on the other hand he writes, "From 1992 to 1993, the Nepalese group of archaeologists should undertake a separate excavation-project in the northern part of the Mustang district, which is a restricted area and not accessible for their German colleagues. During

this time the German participants should concentrate on excavation in the area of Tukche."

Archaeologists concern themselves with the reconstruction of man's past through the study of his material remains. Through their work we can learn something about the societies which have no written records; and even historical sources do not always tell people what they want to know, particularly about everyday life and customs.

Archaeology's main method of investigation is excavation, which depends on the basic principle of stratigraphy - that the remains of earlier generations are covered over by those of their successors. But we have no record in the field of prehistoric archaeology in Nepal. Science, too, plays its part. Among modern scientific methods radiocarbon dating has been the most revolutionary. It is based on the principle of the radioactive isotope carbon-14 we have already discussed.

Other techniques cover man's relationship to his environment. The clearing of forests by neolithic farmers, for example, has been detected from the differing quantities of fossil pollen grains of various plants found in the soil.

Much can also be done without actual excavation. Aerial photography, for instance, has been of great importance for the quest of many archaeological sites, often giving archaeologists valuable clues to the past buried beneath.

There are reasons why the German scientists selected the Mustang area particularly. In the Mustang area there are great many human dwelling caves from the prehistoric to the historic time. Mustang is not so far from the Sagarmatha (Mount Everest) area. Upper Mustang is on the Tibetan plateau and lower Mustang is called Tethys zone. In the Tethys seabed sediments are also available. Dhaulagiri and Annapurna mountains are attached to Mustang. There are also

many glacial sites of the ancient period.

An interesting new technique is the analysis of deep seacores. The skeletons of minute creatures form much of the seabed sediments, and as these creatures are very sensitive to temperature changes, the species represented in a core sample give a clear indication of the range of temperature at the time of their deposition. Although the climate curves obtained from the above techniques belong to relative rather than absolute dating, the climatic curve obtained from deep sea cores closely resemble that of the glacial and interglacial curve, and as the cores can be dated in absolute terms, this should, if the two curves are complementary, date the glacials and interglacials also.

Increasingly, more evidence has been unearthed to show that man's birth place is Asia. Recently, fossils of *Ramapithecus* have been discovered at sites in Pakistan and in China.

A tooth of the "first possible ancestor of man in Nepal and oldest in Asia" has been found near Tinau Khola (river) a couple of miles from Butwal. The discovery made in December 1980, helps to fill the geographic gap in the record of early hominoids between India and China. The age of *Butwal Ramapithecus* is very important. Its preliminary age determination of eleven million years, based on a study known as paleomagnetic analysis, is over one million years earlier than the next oldest dates for Asian specimens. *Ramapithecus* is the earliest fossil primate which many anthropologists believe to be a direct ancestor of man. Rare specimens have previously been found in Kenya, Pakistan, India and China. Mustang area is not so far from Butwal. On the other hand, upper Mustang is geographically in the Tibetan plateau.

Neither can the Tibetan plateau be ignored as possible place of man's origin. In the tertiary period, the geographical features of this region were quite different from today. Successive

explorations in the *Qomolangma* (Jolmo Lungma or Mount Everest or Sagarmatha) area carried out under the auspices of Chinese Academy of Sciences have produced abundant scientific data. We know from the flora here that in the Upper Pliocene, the ecological environment in the Mount Xixia Bangma region at that time was marked by sub-tropical climate with a yearly mean temperature of about 10°C and precipitation around 2,000 mm. In 1975 at a site in the Jilong Basin, which is 4,100-4,300m. above sea level, on the northern slope of Mount Xixia Bangma in the middle section of the Himalayas, fossil remains of the Pliocene three-toed horse (*Hipparion*) were found. This species of forest-grassland dweller is at home in a temperate climate. Sporo-pollen analysis has also produced evidence of a flora that included *Loropetalum*, palm, quercitron, goose foot, cedar, pea and other sub-tropical plants, which tallies with the climatic conditions shown in the composition of local clay minerals. A geological report made on April 16, 1977 by a Chinese geologist, Cheu Wanyong, concluded: "In the Pliocene the Himalayas were about 1,000 metres above sea level and not as pronounced a barrier to the monsoon from the Indian Ocean as it is today, hence both the south and north slopes were benefited by that seasonal, warm, moist wind. It can be safely said that the Himalaya and Tibet Plateaux have since the Pliocene been rising at the rate of approximately 0.025 - 0.03 mm. per year, with an obvious higher rate of uplift after the Middle pleistocene. The present day elevation is at least 3,000 metres higher than in Pliocene times. "This information is of great value. It suggests that during the transition from ape to man both the Tibetan Plateau and the Himalayas in Nepal were regions still suitable for the evolution of higher primates, which makes the regions a hopeful place for seeking missing links in the evolution of man.

In case we find *Ramapithecus* in the Mustang area the question arises as to how to solve the dating problem. Taken in relation to the full range of archaeological time, the upper limit of the carbon-

14 covers less than 10% of the time span. So other methods for dating earlier periods were essential.

The most widely used method for obtaining dates earlier than those from carbon-14 analysis is potassium-argon or K/Ar analysis. Rocks from volcanic eruptions contain small amounts of the isotope potassium-40, which decays into argon-40 at a known rate. The half life of this process is greater than that of carbon-14, so that the technique is useful for much earlier dates. Unfortunately, while carbon-14 has an upper limit of about 70,000-50,000 years, the K/Ar method has a lower limit of about 600,000 years. This gap of some 500,000 years between the two methods covers a most significant period in man's physical and cultural development. To fill this gap other isotope methods are being developed based on the same principle, e.g. thorium/uranium and protactinium/thorium. These new methods seem likely to fill the gap as their half-lives are much more suitable for this time range than K/Ar. In the field of prehistory there are also other methods which are known as palaeomagnetic analysis.

German scientists are working in the Mustang area with the aim to know the whole man, the objects, artistic or otherwise made by him and the environment in which he lived, videlicet, the climate, the flora and fauna and man's social, religious and economic status, including even the probable guess as to the density of population, and finally the stage or stages by which he reached the particular stage under study. Consequently, the archaeological excavations, and the preceding and consequent explorations, have become something like the work of Sherlock Holmes, where nothing is neglected, and much less is discarded. Most minute changes in the colour of the soil or earth excavated are recorded, collected and scientifically examined, and the same care is bestowed on the ash or charcoal as on a precious object of art. If it is an architectural monument, not only is it carefully drawn and photographed, but all possible means are employed to learn about its significance

- about the nature of the stone used and its source, about the technique of manufacture. So the German scientists *already* learned not only about its architectural styles but also about the social, economic, industrial and religious *milieu* which were responsible for its creation.

After going through all these issues, we can come to conclusion that the work which is going under Nepal-German Project on High Mountain Archaeology, which can be considered as an important task for Nepal, will not only lift the human history of Nepal very high but also present the Nepalese prehistoric picture in the globe, a matter of pride to the Nepalese.

Although the project is very important in the Nepalese context, I would like to state one thing clearly here at the end. The German scholars who are doing their work in Nepal are based on modern science. In Nepal, there is no laboratory for experiment on modern atomic science. In India also there are few research institutes, no more alternatives. It is not possible to do our laboratory

work even in India. We must look towards the European countries for this. Prof. Dr. Schuh has pointed out in his introduction that as the Northern Mustang area is restricted for the foreigners, explorations and excavations based on modern science can be done in 1992-93 by the Nepalese archaeologists only and no German can go there. At present we do not have required manpower as well as equipment to deal with the high modern technology. It can, therefore, be strongly recommended that the German scholars also are included in the northern Mustang Archaeological excavation work by giving special permission. Otherwise, our archaeological sites will be destroyed, because as archaeological excavation means re-building of history on one side, it is on the other hand destruction of the site too. Once it is destroyed it cannot be regained. It will be unjust to the nation if full responsibility is given to our officials who are trained only for a period of six months. Therefore, immediate attention is needed to be given to the matters by the concerned agency. It will be better to take wise action timely instead of regretting later.

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