

Palaeo-environment and Prehistory of Nepal

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The kingdom of Nepal, extended in the form of an elongated rectangle between the longitudes of 80°-15' and 88°-15' E and latitudes of 26°-15' and 30°-30' N, is bounded on the north by the Tibet region of the people's Republic of China and on the east, south and west by the Sikkim, West Bengal, Bihar and Uttar Pradesh states of India. The total area of the kingdom is 800 kilometres east-west and its breadth varies from 144 to 240 Kilometres north-south. Geographically, the country is in a privileged position. It lies in a temperate zone with the added advantage of altitude. Except the portion of Tarai, even the valleys, with some exceptions, are nowhere less than 1275 metres above the sea level.

Watered by the Kali, Karnali, Bheri, Seti, Rapti, Gandaki, Bagmati, Kosi and Mechi rivers and their numerous tributaries and decked with a large number of glacial-empounded lakes, the land of Nepal has been divided into five geographical zones namely the Tibetan Tothys Zone, Himalayan Gneiss Zone, Main Central Thrust Zone, Midland Zone, Mahabharata zone and Siwalik Zone (Arita 1982:5-29). The formation process of the Himalaya Mountains signify a most exciting crustal movement producing the biggest upheaval on the surface of the earth. The movement started in the tertiary period and accelerated through the quaternary: the rate of upheaval for these highest mountains in the world being for greater than other mountain ranges (Kizaki 1982:1). Many of the tertiary deposits were raised as foothills and they have been extensively identified and dated by palaeontological evidence. It is here in the Siwalik strata that the extra-ordinarily interesting primates *Sivapithecus* and *Palacosimia* were discovered. The latter appears in the line of orangutan while the former has some relation with the fossil primates grouped in the family of *Dryopithecidae*. This family is famous for its particularly hominid-like teeth, suggesting that it has a definite relationship to human evolution (Sharma 1984:26-27).

Till 1950 no substantial geological studies could be made in the kingdom of Nepal. First geological study of Nepal Siwaliks was made by Auden (1935:123-167) and then by Lombart (1952:46-49) who have only briefly discussed its formation. In 1959 Toni Hagen minutely studied the cross-sections of the Siwaliks and noted three-fold stratigraphic division in its formation. He is of the opinion that most of the exposed Nepal Siwaliks are Middle Siwaliks (Hagen:1969). After Toni Hagen a large number of geologists have studied the Siwaliks and even reported of the fossil remains from there. Their study reveals that the Siwaliks of Nepal possess the same characteristics which have been noted in case of the Kashmir and Punjab Siwaliks by the geologists (Sharma 1984:26-27).

Since 1962 the Tethys Society and various universities of Japan have conducted fruitful geological investigations of the Nepal Himalayas and some of the main achievements of their survey have been published in two Special Issue Volumes of the Journal of Nepal Geological Society respectively in 1982 and 1984. Under the same project during 1980-81 study of the crustal movements in the Nepal Himalayas was also undertaken by them. Their studies has revealed considerable knowledge on the nature of the rocks and terraces of the rivers which flow in the different regions of the kingdom.

A study of the terraces of the Bagmati river by Yoshida and Igarashi reveals that fluvial and lacustrine sediments distributed in the Kathmandu Valley (circular in outline having diametres of 30 km. in EW and 25 km. in NS direction) are divided into eight stratigraphic units in ascending order. According to them the Lukundol formation is of pliocene to early pleistocene period and the southern area of the valley adjoining the Mahabharata mountains was created on account of an upheaval in early to middle pleistocene period after the Lukundol formation. The radiometric dating, palaeomagnetic measurement and pollen analysis of the data reveals that Gokarna, Thimi and Patan deposits correspond to last glacial approach (Yoshida and Igarashi 1984:73-100). Thus, the basin which developed in the early pliocene period remained in the form of a lake till the last phase of the quaternary period. In the middle to late pleistocene period the old Bagmati river cut the ridge of the southern mountain and flowed out southward (Yoshida and Igarashi 1984:73-78).

The Gokarna formation consists of laminated arkosic sand, silty clay and peat, grey or dark brown in colour and has yielded carbonized fossil wood (Yoshida and Igarashi: 1984:79). The Thimi formation (i.e. the area of Pasupatinath, Tribhuvan Airport, Thimi, Bhaktapur and South Patan) consists of fluvio-lacustrine sediments, arkosic sand, silt, clay and gravel layer, grey to light-brown colour. The gravel is mostly composed of granite, derived from the northern mountain region (Yoshida and Igarashi: 1984:80). The Patan formation distributed around the Patan and Kathmandu cities contains the same sediments which have been noticed in case of the Gokarna formation but it is of the later date, i.e. of middle pleistocene period. The lower terraces distributed along the Bagmati river at the height of 5 to 15 metres above the recent flood plain consist of mainly micaceous sand and pebble to granule gravels (Yoshida and Igarashi 1984:74-80). The radiocarbon ages of Gokarna, Thimi and Patan formations from different localities range between 29390 ± 2660 — 24420 ± 1960 ,
=2040

33200 ± 3400 - 23390 and 18970 ± 1480 - 11070 ± 290

years B.P. The pollen analysis of the samples taken from various places indicates that pine, oak and alder abundantly grew alongside spruce, fir and homlock. The pollens of *Pediastrum borianum*, which are usually found in lakes, ponds and rivers have been also found in plenty (Yoshida and Igarashi 1984:87-95) which confirm the statements of the earliest chronicles of Nepal that Kathmandu Valley was lake in the beginning (Wright 1958:45-63). While talking about the animal fossils, West and

Munthe have written that "freshwater invertebrates are frequently found in the stream cuts south of the Chaubhar Gorge alongwith fish scales. The most interesting fossils yet reported from the Kathmandu Valley are a few well-preserved vertebrate specimens which have been recovered from the clays and lignites along Nakhu Khola" (West and Munthe 1984-85:103). A tooth of *Stegodon*, a fragment representing *Crocodylus* and a fragmentary tooth of *Elephas planifrons* and *Hexaprotodon silvalensis* have been found, but considerable searching has failed to reveal additional large vertebrate fossils. The two proboscideans, together with the hippopotamus and crocodile, provide evidence for a very wet environment. "It is possible to visualize the Kathmandu valley in early pleistocene time, some 1.5 million years ago, nearly filled by a large lake with well-forested shorelines providing a suitable environment for many species of large mammals" (West and Munthe 1984-85:103).

The studies of Yoshida and Igarashi also reveal that the climatic environment of the Kathmandu Valley at the time of the Lukundol formation or early pleistocene period has been "relatively mild and/or warmer and moister than that of the present, although containing a cool spell. Afterward the climate changed drastically in the Gokarna formation period from mild and moister to cold and drier" (1984:73-95). The Patan formation was deposited in the late stage of Main Wurm with its cool condition (1984:73-95). The pollen grain analysis elucidates that at the time of the Lukundol formation period tropical evergreen upper montane forests, Gokarna formation period temperate coniferous forests and Patan formation period tropical evergreen montane forests grew in the Kathmandu Valley. The Lukundol formation has been correlated to the pliocene to lower pleistocene Karewa formation in the Kashmir Basin and Siwalik group. The Lukundol fauna corresponds to the *Elephas planifrons* Internal-zone of the Siwaliks of Potwar Plateau belonging to middle pleistocene period (Yoshida and Igarashi 1984:87-94).

The Karewa deposits and Potwar Plateau have been minutely studied by the geologists and archaeologists. Their studies reveal that throughout the pleistocene period man had lived in this region and made lithic tools for his persistence (Krishnaswami 1978:11-58). In the Kathmandu Valley also prehistoric survey has been conducted and tools from Gokarna and Dhobi Khola, i.e. Thimi formation period have been collected on the river terraces and the beds, indicating that as in the Punjab and Kashmir Valley in Nepal also man lived and hunted animals in the style of the savage men of the other parts of the world. Schetenko is of the opinion that the tools of the Dhobikhola of the Kathmandu Valley are similar to those of Mongolia, China and Soviet Premorye and can be dated back to 30 millennium B.C. (1978:1-2). This reminds the present researcher of Chinese geologist Chen Wanyong who has advanced the theory that "in the pliocene period the Himalayas were about 1000 metres above sea level" only and, that is why, they did not deter the movement of the mammals from one direction to other and the monsoon from the South Indian Ocean as they do it today owing to their enormous height (Sharma 1984:29-30). After the pleistocene glaciations and interstadials when temperate climate started, neolithic revolution commenced in the Kathmandu Valley

as in the other regions of Nepal. This fact is attested by several neolithic finds from the valley (Sharma 1983:1-12).

The river Kali-Gandaki and its tributaries, which flow in mid-western Nepal, have been extensively studied by the geologists. According to them the Pokhara Valley spread around the Seti river is filled up with a large volume of gravel deposits, mostly from Annapurna Mountain, and presents splendid terraces for the study of the quaternary geology. Hagen has forwarded the theory that like the Kathmandu Valley once the Pokhara Valley was a single huge lake but the recent studies of the geologists revealed that only marginal lakes were formed due to the damming of tributaries there. The quaternary deposits overlie the Midland Meta-sediments and are divided into nine stratigraphic units called Begnas, Siswa, Tallakot, Ghachok, Phewa, Pokhara and Rupakot formations. Of these the Pokhara formation is constituted of fluvial gravels accumulated by the Seti river and lacustrine deposit interfingering with the gravels. Hormann is of the opinion that Pokhara formation took place during the last glacial ages whereas the Rupakot terrace was formed in the post glacial period (Yamanka and others 1982:113-42). In the month of March of 1986 the present researcher collected some tools from the Pokhara formation which are similar to those of Kangra and Guler. At Kotre even a neolith was found which shows that after the glacial period was over, neolithic men occupied the Pokhara Valley for their habitation. The Phewa and Rupa lakes indicate that the neolithic people of the Pokhara Valley widely ate fish of these lakes.

The studies made by Yamanka, Yoshida and Iwata of the terraces of the Thakakhola in the neighbourhood of Muktinath, Kagbeni and Marpha reveal that they were formed during the late pleistocene period (1982:81-94). No evidence of early man has been found from there so far. The terraces along the Kali-Gandaki and Marsyangdi rivers of Central Nepal reveal the same story. They are also of tectonic origin and quaternary period (Yamanka and Iwata 1982:95-111). The human skeletons, bone arrow-heads, channel-spouted bowls, shell-ornaments and copper implements including anthropomorphic figures of the Thakakhola region reveal that during the early neolithic and chalcolithic periods this region was an important area of human activities (Tiwari 1985:1-12). The neoliths of Charikot also provide testimony to this fact (Sharma 1983:1-12).

The study of the Siwaliks and Dang and Chitwan valleys reveals that since the beginning of the quaternary period man was quite instrumental in the lower Himalayan region. The lower, middle and upper formations of the Siwalik in and around the western part of the Chitwan Valley are roughly correlatable to lower, middle and upper Siwaliks of India and Pakistan (Tokucka and Yoshida 1984:63-72). Iwata and Nakata of Japan Metropolitan University have studied the river-terraces and crustal movement in the area around Narayanhata. They found four kinds of terraces namely the highest, higher, middle and lower. According to them the lower terraces were formed during the holocene period and the highest and higher in the pre-last interglacial time. The middle terrace groups correspond to the last glacial and/or interglacial period. Main aim of Iwata and Nakata was to study the crustal movement of the area

(1985:33-42) and, therefore, they did not care to explore the archaeological potentialities of the locality.

In the winter of 1968-69, N.R. Banarjee and J.L. Sharma carried out the prehistoric study of the terraces of the Gandaki river, locally called Marayani in Nepal, in the Navala-Parasi district between Tribeni Ghat and the Siwalik Mountain. Between Ratanpur and Pithaunji Ghat they found a succession of 5 terraces. At Danda in the loosened gravel of the fifth terrace they discovered some handaxes, cleavers, choppers and serapers of quartzite. Most of them have got calcareous outer skin of 'whitish appearance'. The tools were not in situ. Although much rolled up they do not show any patina on their body. Banarjee is of the opinion that the southern part of Nepal, particularly the upper terraces of the major rivers, were the habitat of the prehistoric man during the quaternary period (Banarjee 1969: English Section 6-9).

The land stretched between the Ramdikhola and Butwal is important both for the anthropologist and archaeologists. Sakai and Yoshida have extensively studied the stratigraphy and palaeomagnetism of the Tansen area in this region (Sakai 1984:41-52). Here near the Tinau Khola, only a few kilometres to the north of Butwal, Hutchinson, a member of Joint Nepal -- U.S.A. Scientific Expedition Team, found the left upper molar of the hominoid *Ramapithecus*. The palaeomagnetic analysis of the rocks from where this tooth was found revealed that Butwal *Ramapithecus* lived in the Siwaliks of Nepal about 11 million years ago. *Ramapithecus* is the earliest fossil primate. Many anthropologists believe that he is the first 'direct ancestor of man' in Asia (Sharma 1984:25). Along with the upper left molar of the *Ramapithecus* a large number of fossil remains of fish, crocodile, elephant, etc. were collected by Jens Munthe and his wife of the expedition party. The tooth and other specimens found in the neighbourhood of Butwal in the same stratum of rock throw immense light on the environment of the Siwalik man (Banarjee 1969:6-9).

The geology of far-eastern and far-western Nepal is very little studied so far. Both the regions abound in the valleys of fluvio-glacial and lacustrine origins of pliocene to pleistocene periods. The valleys of Surkhet and Dang are very significant from the view-point of palaeo-environmental studies. The present researcher himself collected some palaeoliths from the bed of Hapurkhola and a neolith in the fields of Katuki Sewar on a terrace of the tributary of the Babhai (Saryu) river in 1966 (Pandey 1983:55). These tools and the shouldered axes of the Surkhet valley from the Latikoili temple area reveal that throughout the quaternary and early holocene periods the Dang and Surkhet valleys were the habitat of man in Nepal.

During 1984-86, Gudrun Corvinus of Eviangen University, Germany studied the miocene-pliocene stratigraphy and geology of parts of Siwaliks and its palaeontological potentials in order to determine the age and palaeo-environment of the Siwalika group sediments with those known from Indian sub-continent and Pakistan. The same time she studied the pleistocene and early holocene periods also for ascertaining if Nepal had some settlements of palaeolithic and neolithic man. She

selected the road which was being built to connect the Dang Valley from Koilabas through the Deukhuri Valley. The exposed sections of the road during the cutting and blasting provided a number of vertebrate fossils in situ in the rocks, mainly in the compact sandstones which seem to constitute the middle part of the Siwaliks (Corvinus 1985:1-6). Also a very great amount of plant fossils, of leaf impressions and of fossilized, carbonized wood was found, the wood mainly in association with the vertebrate fossils in the sandstones, and the plant and leaf material throughout the succession, but more commonly found in the clastic deposits of clay-stones and mudstones in the older period. Besides these fossils a number of horizons full of molluscs could be recorded, which yielded plenty of gastropods and lamellibranches, sometimes so rich that they form lumachelle horizons in the clays. In course of her investigations near the Chorakhola bridge Corvinus found "a lonely set of animal footprints of some smaller antiodactyl animals" as well (1985:1-6). West and Munthe have written that Dang Valley has given the same fossil remains which have been noted in case of the Kathmandu Valley (1985:103-105). According to them the Dang Valley was a lake "approximately 2.5 to 1.5 million years ago", which corresponds to the geological time of latest pliocene and earliest pleistocene periods (Corvinus 1985:1-6).

The environment of the earlier period in the valley seems to have been quite. Below the Middle Siwaliks is the deposition of clay, silt and mud in quite waters" of small backwaters and marshy terrain" with small ponds and occasional fluvial intercalations, and with a greater wealth of plant life (Corvinus 1985:1-6). The middle part of the earlier period indicates "a wide flat riverine environment with a broad net of widely meandering and braiding streams and broad flood beds with ever changing points and traverse bars" (Corvinus 1985:1-6). The upper Siwaliks with deposits in the form of thick conglomerate banks presents a scenery which is characterized by large fans and sheets of boulder/cobble gravels at the foot of the mountains.

The researches in the Arjuna Khola between the Dang and Deukhuri valleys and between Nepalgunj and Surkhet valley provided the same kinds of material deposits and plant and animal life to the investigator, indicating the fact that the strip of Siwalik Mountain in Nepal had the same kind of environment everywhere between the Mechi and Mahakali rivers in the past. This fact is well confirmed by the concentrated survey of the Kamala river in eastern Nepal where a great amount of vertebrate fossils have been recorded in the sandstone deposits of the Middle Siwaliks along with many plant fossils, leaf-impressions and carbonized wood, as well as molluscs in some very concentrated horizons (Corvinus 1985:3). The most interesting discoveries of this area are the large animal fossils, some partly fragmented and some well-preserved skulls of crocodiles, large pig, antelope and elephant. One large elephant skull, which is almost complete and was taken out from the sandstone "seems to belong to a *Stegodon* and is probably of an Upper Siwalika age, comparable to the Pinjors in India" (Corvinus 1985:3). These discoveries give a clear picture of the palaeo-environment and palaeontology of the Siwaliks in Nepal from where a large number of lithic tools comparable

to the tools of Indian Siwaliks have been discovered by the archaeologists in their survey works. The researches of Gudrun Corvinus in the Dang and Deukhuri valleys attest that prehistoric man lived there at the margin of the formerly existing lakes which originated there when the rivers blocked due to the continuation of orogenetic movements after the forming of the Dun valleys. Prehistoric sites have been located in these valleys "and in association with a colluvial silt which form terraces in the Rapti and Babhai valleys and interfinger with fluvial and probable lacustrine sediments." (1985:5).

The environmental situation of the Tarai of eastern Nepal had been quite different. Here the sites are not connected with intermontane Dun valleys but located on the river terraces of the streams which leave the Siwaliks and enter the plains. In the flat plains of Tarai these streams contain riverine terraces at the edge of the mountains which were perhaps occupied by the stone age men in the style of the Sohan valley stone age people of India (Corvinus 1985:5). The study of the stratigraphy of the Sabhaya Khola in the Sankhuwa Sabha district, i.e. the mountaineous area of eastern Nepal, by Andrews reveals that it has the same mode of land-formation which are found in the localities of the Kathmandu valley and Nuwakot (1985:12-35). One jaw fragment of the hippopotamus *Hexaprotodon* found near Janakpur in south eastern Nepal is similar to those found in the Dang and Kathmandu valleys. This specimen shows that as in the Midlands, the Tarai region of Nepal was also occupied by the water-and-forest-living animals in the early pleistocene period (Corvinus 1985:5-6).

After a cursory appraisal of the palaeo-environment and geological data of the plio-pleistocene and early holocene periods let us now analyse the archaeological finds of the time for reconstructing the early history of man before the beginning of the historical period in the Himalayas of Nepal. It has always been a question of great interest to the archaeologists whether stone-age man did in fact live in Nepal. Several attempts were made in the past by the archaeologists in this regard. Toni Hagen, while studying the geology of Nepal Himalayas, noted that the caves and cave-shelters of the country were the abode of the earliest human beings about 7 million years ago. Now the discovery of a left upper molar of the *Ramapithecus* in Tinaukhola near Butwal elucidates that the belt of Nepal Siwaliks was occupied by the earliest ancestors of the men of Asia about 11 million years ago since now. The *Ramapithecuses* could walk erect, had the knowledge of fire and used spilt stones and wooden stick of the trees as tools for hunting animals. The bones of crocodiles and fish found in the bed rock of the molar tooth shows that they ate these animals in their diet. Janak Lal Sharma is of the opinion that when the Himalayas were not so high, the *Ramapithecuses* had their free movement from the region of the Siwaliks upto Central Asia (1984:25-31). That is why, Stechenko, who studied the prehistory of Nepal in association with Sharma, after the discovery of some tools in the Dhobikhola of the Kathmandu valley and the neighbourhood of the Danda river in the Navala-Parasi district, has written that the lithic complex of Nepal has some analogies in Mongolia, China and Soviet Premorye where gobien cores have also been found and can be dated back to 30 millennium B.C. (1978: 1-2).

R.V. Joshi of the Archaeological Survey of India conducted the prehistoric survey of the Kathmandu Valley in 1964 but he did not find any lithic tool in course of his exploration (Joshi 1966). In 1966-67 the present researcher for the first time discovered some stone tools in Nepal. Two of them, one an unifacial chopper of pre-Chelian type of quartzite from the neighbourhood of Danavatal, Bardia district, Bheri zone (Sharma V.S. 2039:Fig.2, Facing page 27) and the other a neolithic celt of phillyite from Katuki Sewar, Dang valley of Rapti zone (Banarjee and Sharma 1969:53-58, Fig. 1-9) of western Siwalik region are quite noteworthy at this place. In 1969 Banarjee and Sharma also discovered some tools from the neighbourhood of Danda of the Naval-Parasi district of central Tarai region (1969:6-9). After 1969 many scholars devoted their attention towards this field. Stecheneko and Gudrun Corvinus are quite significant among them. The former found out some palaeoliths and neoliths in the Naval-Parasi district and declared that the tools could be compared with those of Punjab and Kashmir in India and Pakistan (Corvinus 1985:7-12). The latter did not only collect palaeoliths and neoliths but also some microliths from the Deukhuri valley of Western Nepal. The prehistoric researches of the scholars mentioned in the foregoing lines show that throughout the quaternary and early holocene periods atleast the Siwalik and Mahabharata belts of Nepal were under habitation by the prehistoric men.

The palaeolithic industry which forms the archaeological data for the palaeo-environment of Nepal could be divided into three major groups namely palaeolithic, microlithic and neolithic-chalcolithic. The palaeoliths of Nepal are mostly choppers, handaxes, scrapers and cleavers of quartzite (Stechenko 1978:1-2, Banarjee 1969:6-9 and Corvinus 1985:7-12) of Sohanian type. The handaxes were used by the prehistoric men for grubbing up roots and tubers, cutting down trees and digging holes. Banarjee and Sharma have not given any illustration of their tools in their paper. Stecheneko has, however, given the photographs of a few tools of which the handaxes seem much rolled up and their pointed edge are also broken. The scrapers and choppers are in mint condition and their flake scars are clearly visible in the specimens (1978:1-2). The cleavers of Banarjee and Sharma show broad cutting edge formed by the intersection of two large flake scars inclined to one another at a small angle (1969:6-9).

At Dainagoan in the Deukhuri Valley, Gudrun Corvinus found an unifacial chopper of Sohanian type within a sub-recent reworked cobble gravel of the stream (khola) and it is covered with a lime crust. It has "a sharp edge of 70° in comparison to the almost 90° angles of side-scrapers, but otherwise is quite similarly fashioned on a quartzite cobble with the edge formed from a flat cortex surface of the cobble" (Corvinus 1985:11). The other palaeolith of Gudrun Corvinus is a hand-axe-like tool found near Ranigora in a gully, which had cut its bed into alluvial silts. It is much rounded and rolled up. The praximal part is broken away and existing distal part is well worked into a hand-axe like point (Corvinus 1985:11). Both the tools have been made from the pebbles of soft tuffaceous material, and, therefore, they are not

very much suitable for any work. Of this material a number of unifacial chopper/core-scrapers and flakes have also been discovered from Kurepani, Lamahi and Arjunakhola. These tools indicate that the prehistoric men had not only occupied the Dang and Deukhuri valleys but had penetrated into the Himalayan valleys via the heavily forested Siwalik mountains (Corvinus 1985:11). At this place it is significant to note that Gudrun Corvinus gives great credit to her discoveries and rejects the authenticity of the old stone age tools discovered by Banarjee, Sharma and the present researcher in the different localities of Nepal by announcing that Kathmandu and Chitwan valleys have "so far proved to be sterile" (Corvinus 1985:8).

In the Pokhara valley the present researcher discovered some tools of old stone age which have been made on block-and-block technique. At Batulichaur and Tulsiban some cleavers, side-scrapers, ovates and discoidal tools were also found by him. The unifacial choppers of Dulu-gaunda and Kotre remind one of the chopper-chopping industry of Guler in India. From the flat terraces of Gaganagaunda, Devies Fall and Damauli of the Rupakot formation period cleavers were also found and they reveal the prevalence of advanced tool technology in the proceeding phase. Even from the bed of the Karnali river near the Tikapur Camp of Western Nepal an unifacial chopper was picked up. One tool of the Chinchung Khola, Bheri zone, is fashioned in the Clactonian style with secondary chipping on the sides, indicating its retouching by the man who used it in his life. These old stone-age tools provide ample evidence in regard to the occupation of the Siwalika and Mahabharata mountain valleys of Nepal by the prehistoric communities since the very dawn of human civilization.

During the middle palaeolithic period the flakes which came out at the time of making choppers and handaxes were again retouched and used by men and thus originated the macro and micro lithic tools in Nepal in the proceeding phase. This fact is clear from the investigations of the Dang and Deukhuri valleys by the present researcher and Gudrun Corvinus. Prepared striking platform and concave or convex bulb of percussion are two notable features of such tools. Materially, typologically and functionally these tools are quite different from the tools of old stone age. The environment of the time played a great role in the evolution of these implements.

The microlithic culture of Nepal is represented by a variety of small flakes of chert, quartz and quartzite of which a lunate and a discoidal core from Lamahi, Deukhuri valley are of particular interest (Corvinus 1985:9). The tools of Chaupatta are similar in type but of macro-size. At Dainagoan of the Dang Valley large number of microliths made from chert, quartz, cristal quartz, quartzite, indurated shale and tuff were discovered by Gudrun Corvinus. She has given the photographic illustrations of 17 microlithic tools in Fig. 4 (a) and (b) of which 9 tools of Fig. 4 (a) are made from quartzite and are flakes with small, often prepared platforms. One can easily notice pronounced step-flaking at the edge of the platform on the dorsal face. The most dominant artefact among the microliths "is a cobble tool which had one unifacial, straight edge which is formed by steep primary, secondary and step

flakes taken off from a flat cortex plane of the cobble. This type of unifacial chopper or corescraper is found almost in every locality (Corvinus 1985:10). The tool has been made from a quartzite cobble. At Gidhnaniya in the Tui Khola Valley corescrapers, flakes, cores and waste pieces of quartzite have been discovered under the fluvial cobbles and therefore their palaeolithic period is definite (Corvinus 1985:10-11).

In the month of April of 1986 some microliths were discovered from Surkhet and Dang valleys by a prehistoric survey team of C.N.A.S. Of them one side-scraper from Khorke Khola, made on a quartzite flake, is 10.5 cm long and shows two ridges on the front side while its dorsal part is flat. Several points were collected in course of the survey of which one point from the terrace of Sewar Khola is more like a burin and shows a ridge in the middle. The points of the Surkhet Valley and Tikapur region are of oval shape and their pointed parts are often blunt. One 11.2 cm long point from the terrace of Kattukhola, Dang Valley should be taken as point-cum-side-scraper for its cutting edge on the side. Several sidescraper-cum-points, burins, notched points, asymmetrical points and blades of non-geometrical type were found at different places of the Dang and Surkhet valleys by the exploration team which attest that there is a distinct phase of microlithic culture in western Nepal during the middle palaeolithic period.

The evidence of neolithic culture is somewhat larger than those of the palaeolithic and mesolithic or microlithic. A large number of neoliths are reported from throughout the whole length and breadth of the kingdom. After the end of the glaciations in the early holocene period when modern flora and fauna grew on the surface of the earth, on account of a new kind of environment a new kind of human life started with permanent villages, domestication of animals and the use of pottery. This fact is proved even by the stratigraphical evidence of the country. The neoliths were used by the modern men for the purpose of deforestation and digging the fields and edible roots of the forests of their localities.

The neolithic culture of Nepal is so far represented by the surface collections from Charikot of the Dolkha district, Jugugaoan - Khopasi in the Kavare Palanchok district, the Chitwan, Dang, Deukhuri, Surkhet and Kathmandu valleys and Morang and Sunasari districts. The majority of neoliths of Nepal are cyclic and sub-rectangular axes with curved medial ground edges which correspond to the principle types of Assam, north-eastern India. They have been divided into three functional types called celts, adzes and chisels. Most of the neoliths of Nepal are in fairly fresh condition and some of them even today retain their sharp edges. The celts abound in them. Often they are small in size "round and cyclic in form and have bifacial working edges. The butt-ends are either rounded or flat. The medial cross-sections are mainly confined to two geometric forms, ovaloid and cyclic or sub-rectangular" (Sharma 1983:2).

The largest neolith is one which the present researcher discovered at Katuki Sewar of the Dang Valley in 1966. It is made of whitish grey phyllite and shows a green core. It is an axe of lenticular section with a broad, almost straight cutting edge. It is 19 cm. in length and 7.3 cm. at the cutting edge and 4 cm. at the flatish butt. Banerjee and Sharma have written that in shape and length it recalls the long and narrow blade of iron used by the women folk of the formers by fixing a long pole into the hole of the blade in the Kathmandu valley and suggests a similar use (1969:57).

Janak Lal Sharma has given the sketches of 7 neoliths in his paper (1983: Figs. 1-7). Six of them are axes and one chisel and they prove that Dolkha district of the Janakpur zone is a promising locality of neoliths in Nepal. The neoliths of the Kathmandu valley (Fig. 9), Nayala-Parasi and Jhapa districts (Figs. 11 and 13) reveal the same fact (Sharma 1983: Figs 11 and 13). These neoliths and the neolith picked up at Katuki Sewar by the present researcher show that in these two districts neolithic tool-technology and cultures existed in Nepal, and the Dang Valley was the meeting place of these cultures. Recently Gudrun Corvinus (1985:7-17) has also claimed to have discovered some neoliths from Dang and Deukhuri valleys. However, she has not given detailed account and illustrations of her discoveries like Stechenko did (1978:1-2).

Although the present researcher collected some shouldered axes from the Dang and Surkhet valleys in 1966, they were not given any importance by the archaeologists. This year again he found some shouldered axes in the Dang and Surkhet valleys. These implements show that as in Eastern India and Burma in Nepal also such tools were used by the people. They were definitely hafted and used for digging the roots of plants and herbs, and for breaking the clods of hard clay in the fields. Even one neolith the present researcher picked up at Kotre on the post-glacial river terrace of the Seti river. On the typological grounds the neoliths of Nepal have been dated between 1000 and 200 B.C. (Banarjee and Sharma 1969:53-58). However, Mohan Prasad Khanal and an Italian Excavation Party of the Kathmandu Valley have claimed to have found out some celts in the Lichchhavi stratified layer at Changu and on the surface of the Satyanarayan temple site of the Lichchhavi period respectively which simply indicate that the neolithic pattern of life continued in the Mahabharata Mountain ranges of Nepal in the early historical period also.

In the village of Takuchha on the right bank of the Kali-Gandaki river in the district of Mustang of Northern Nepal a cave-burial called Chokhopani has been discovered in 1984. The burial contained two fragmentary skeletons, hand-made grey vases, copper implements and carrings, shell-ornaments, stone (chert) arrow-heads and musk-deer teeth. Besides the globular pots and small jars some spouted pots and channel-spouted bowls, as at Navadatoli, have also been found over there. Outside India such vessels have been found in Late Neolithic and Early Bronze Age Crete (c. 2500-200 B.C.), Anatolia and Iran. But the bowls of Chokhopani are much similar to the bowls of Sialk Necropolis B and Gian. After a thorough analysis Tiwari, who discovered these objects, dates the cave

materials between 1000 and 400 B.C. Iron is absent here and pottery is grey and handmade (1985:1-12, pps. I-VII). The anthropomorphic figures of copper of the copper age of India, elaborately described by B.B. Lal in an article of *Ancient India*. The copper amulets, shell objects and arrow-heads of chert remind one of the copper age traditions recorded in various excavations in the Indo-Pak sub-continent. The present objects show that human culture advanced in the mountaineous region of the Himalayas of Nepal together with India and China and inhospitable landscape and environment of the country was not able to deter the people from having contact with the outside world.

Thus a peep into the prehistory of Nepal would elucidate to a fact-finder that this country is the abode of the first ancestors of Asia. In the plio-pleistocene period when great changes were taking place on the surface of Nepal owing to crustal movement, the Ramapithecus took his birth here about 11 million years ago. Like the Australopithecines of Africa he knew the use of fire, could walk erect and used pebbles, naturally spilt suitable stone flakes and wooden stick for hunting animals and water creatures such as fish and crocodile for his meals. As the time passed on, from them evolved the chopper-chopping tool-using men and they occupied the whole of the Mahabharata and Siwalik mountain ranges and valleys. This fact is attested by the chopper-chopping industry of the country from various regions.

In course of time the glacial period and quaternary flora and fauna ended and modern environment prevailed on the land with forests, everywhere which provided substantial means of livelihood to modern men of different origins to domesticate animals, live settled life and start agriculture. The modern men of Nepal, as elsewhere, made neoliths of different kinds for the purpose of deforestation and agriculture and invented pottery for storing their foodgrains, and for the purpose of cooking, eating and drinking. This fact is beautifully attested by the finds of neoliths alongwith handmade coarse red and grey ware sherds in the earlier strata of various excavations. The neolithic pattern of life continued in Nepal till the rise of the monarchical and republican states of northern India in the seventh century B.C. When powerful states evolved in Aryavarta and teachings of Lord Buddha gained momentum in the society, art of writing became very popular and written edicts and documents of the rulers began to be issued alongwith properly stamped coins. Now various social, legal and economic institutions also evolved under various organized governments. Since that time historical period begins and palaeolithic and neolithic patterns of life came to an end. However, Nepal being an inhospitable mountaineous country, its inhabitants of the innermost valleys and localities even today retain some prohistoric traits in their socio-economic and cultural life. This fact will be clear to the scholars who would take the pains to study the socio-cultural dynamics of the Kirats, Tharus, Chepangs, Tamangs and various other ethnic communities of the kingdom which occupy the remote interiors of the country in different regions.

REFERENCES

- Andrews, E., 1985. "Stratigraphy of the Sabhaya Khola Region, Sankhuwa Sabha District, Eastern Nepal." *Journal of Nepal Geological Society*, 2: 2, pp. 12-35.
- Arita, K. and Others, 1982. "Geology and Structure of the Pokhara - Piuthan Area, Central Nepal." *Journal of Nepal Geological Society*, 2:2 Special Issue. pp. 5-29.
- Auden, J.B., "Traverses in Himalayas." *Records of Geological Survey of India*, No. 69, pp. 123-167.
- Banerjee, N.R., 1969. "Discovery of the Remains of Prehistoric Man in Nepal." *Ancient Nepal*, No. 6, pp. 6-9 (English section).
- Banerjee and Sharma, 1969. "Neolithic Tools From Nepal and Sikkim." *Ancient Nepal*, No. 9, pp. 53-58.
- Corvinus, Gudrun, 1985. "Report on the Work Done in the Project of Quaternary and Prehistoric Studies in Nepal." *Ancient Nepal*, Nos. 86-88, pp. 1-6.
- _____, 1985. "Prehistoric Discoveries in the Foothills of the Himalayas in Nepal." *Ancient Nepal*, Nos. 86-88, pp. 7-12.
- Hagen, T., 1969. *Report on the Geological Survey of Nepal*, Vol. I, Zurich: Denksehv. Sehweing Nalurf. Gesell.
- Iwata, S. and Others, 1982. "Glacial Landforms and River Terraces in the Thaka Khola Region, Central Nepal." *Journal of Nepal Geological Society*, Vol. 2 (Special Issue), pp. 81-94.
- Iwata, S. and T. Nakata, 1985. "River Terraces and Crustal Movement in the Area Around Narayanghat, Central Nepal." *Journal of Nepal Geological Society*, 3: Nos. 1-3, pp. 33-42.
- Joshi, R.V., 1966. "Prehistoric Exploration in Kathmandu Valley." *Ancient India*, No. 22, pp. 1-10.
- Kizaki, K., 1982. "A Study of the Crustal Movement in the Nepal Himalayas." *Journal of Nepal Geological Society*, Vol. 2, (Special Issue), pp. 1-3.
- Krishnaswami, V.D., 1974. "Stone Age India." *Ancient India*, No. 3, pp. 11-58.
- Lombard, A., 1952. "La Tectonique du Massif de L' Everest." *Architecture Society of Jeneva*, pp. 46-49.
- Pandey, R.N., 1983. "Some Aspects of History and Culture of Western Nepal." Unpublished Ph.D. Thesis. T.U.

- Sakai, H., 1984. "Stratigraphy of Tansen Area in the Nepal Lesser Himalayas." *Journal of Nepal Geological Society*, Vol. 4, (Special Issue), pp. 41-52.
- Sharma, J.L., 1984. "17 Million Year Old Primate Fossils Could be Link Between Man and Ape." *Ancient Nepal*, No. 79, pp. 13-32.
- _____, 1983. "Neolithic Tools From Nepal." *Ancient Nepal*, No. 75, pp. 1-12.
- _____, 2039 V.S. *Hamro Samaj: Eka Adhyayana* (Our Society: A Study). Text in Nepali. Kathmandu: Sajha Prakashana.
- Stechenko, 1978. "The Outcome of Scientific Mission to Nepal in Brief." *Ancient Nepal*, Nos. 43-45, pp. 1-2.
- Tiwari, D.N., 1985. "Cave Burials From Western Nepal, Mustang." *Ancient Nepal*, No. 85, pp. 1-12.
- Tokuoka, T. and M. Yoshida, 1984. "Some Characteristics of the Siwalika (Churia) Group in Chitwan Dun." *Journal of Nepal Geological Society*, Vol. 4, (Special Issue), pp. 68-72.
- Wright, D., 1958. *History of Nepal*. Reprint Edition, Calcutta: Susil Gupta (India) Pvt. Ltd.
- Yamanaka, H. and Others 1982. "Terrace Landform and Quaternary Deposit Around Pokhara Valley." *Journal of Nepal Geological Society*, Vol. 2, (Special Issue), pp. 113-142.
- Yamanaka and S. Iwata, 1982. "River Terraces Along the Middle Kali Gandaki and Marsyangdi Khola, Central Nepal." *Journal of Nepal Geological Society*, Vol. 2 (Special Issue), pp. 95-111.
- Yoshida, M. and Y. Igarashi, 1984. "Neogene to Quaternary Lacustrine Sediments in the Kathmandu Valley." *Journal of Nepal Geological Society*, Vol. 4 (Special Issue), pp. 73-100.
- West, R.M. and Jens Munthe, 1985. "Fossils." *Nepal Nature's Paradise*, pp. 102-105.