The Land

Geomorphological Sequences of North East India
With Special Reference to Meghalaya

Northeast, a cluster of seven states, located in the easternmost part of India, is an integral landmass characterised by hills, mountains and valleys. The geomorphic history of the region exhibits a series of interrelated events. The reconstruction of the events is possible through the works of various oil agencies, like BOC, AOC, ONGC and Oil India. Based on both surface and subsurface data obtained through drilling, Murthy (1968:10-15) systematically arranged the sequences. This is as such:

The most prominent feature of the region is the narrow Brahmaputra valley, flanked by the Arunachal Himalaya to the north and east, the Patkai-Naga- North Cachar Hills to the southeast. The surma valley is on the northeast of N.C. Hills. The Naga Hills extend to the south into Mampur and to the southeast into the Lushai Hills and the adjoining Hills in Tripura and then into the alluvial plains of Bangladesh. The Garo, Khasi and Jaintia Hills rising abruptly from these plains.
Northeast, in the broad sense, consists of very ancient archaean and Shillong Series rocks, exposed in large parts of Garo, Khasi, Jaintia and Mikir (Karbi) Hills. These are similar to rocks exposed in the rest of the peninsula in Bengal and Bihar as an integral part.

About 472 myr ago, the eastern part of the Khasi Hills, the Jaintia Hills and the western part of adjacent Karbi Hills became a basin of sedimentation of sandstones and shales of Shillong Series (Sarkar et al 1964: 159). These were later uplifted and became a landmass.

The region remained a landmass till permo carboniferous times. Then about 250 myr ago in the Arunachal Himalayan region to the north and to the south and west of the Shillong Plateau, sedimentation began. In these basins were deposited the coal-bearing sediments of the Gondwana – marine in the Himalayan region and fresh water in the west of the Garo Hills.
By the end of Jurassic times about 150 myr ago, the Khasi Hills experienced plateau volcanism, through east-west fissures, along which the southern block foundered and the northern block rose, as a result of which the sea intruded into the southern block and deposited the upper cretaceous sediments around 110 myr ago. This happened upto Eocene times, about 60myr ago; and by that time the area had reached stable shelf conditions and fossiliferous calcareous formations began to be deposited.

During Palaeocene, large parts of Shillong plateau and the Karbi Hills became basins of fresh water sedimentation – in which Therria sandstones were deposited. The Garo Hills, the Jaintia Hills and the Karbi Hills remained a landmass till mid-Eocene times.

During late Eocene times sedimentation continued in the submerged portion of the southern Garo Hills, in the southern margins of the Khasi Hills and the depressed southeastern part of the Jaintia Hills. During the same period, Nagaland, Manipur, Tripura and the Mizoram were under sea, while the Karbi Hills stood as high ground and there was no sedimentation. The Khasi Hills were rising relatively more compared to the Garo and Jaintia Hills.

At the end of Oligocene (about 30myr ago), part of upper Assam experienced uplift exposing the earlier deposited sediments, that is, Barail sediments deposited during 40 myr ago.

During lower Miocene (about 25 myr ago) Khasi and Jaintia Hills became uplifted, while the Karbi Hills and its adjoining area to the east became
depressed after having remained a landmass from late Eocene times; and Surma sediment were deposited.

After Miocene times uplift started on a large scale and during Pliocene (about 10 myr ago) there was a rapid uplift of the Himalayan source area to the north and the northeast, resulting in the deposition of thick beds of pebbles, cobbles and boulders forming the Dihangs.

During the Pleistocene (about 1 myr ago) upward movement continued; forming the mountain chains in the Himalayan region along with river terraces at three different heights indicating that there were three major periods when uplift was relatively rapid.

The Brahmaputra Valley entered into its present configuration during Pleistocene and recent times. The present physiography of the region is a result of 100 myr of geomorphological activities of uplift and down sinking in different parts at different geological periods.

Physiography

Meghalaya is a new name added to the political map of India. It constitutes the territory popularly known as Khasi and Jaintia Hills and Garo Hills, named after the tribes of the soil. These territories were the part of Assam Hill division till the creation of the state under the Republic of Indian union in 1972 (fig: 1.1 & 2.2).
From geo-ethnic and archaeological point of view the entire region may be divided into two broad divisions, namely the United Khasi Hills and the Khasi-Jaintia and the Garo Hills.

1. The Khasi and Jaintia Hills

The united Khasi Hills, extending upto piedmont belt is located between 25°1′ and 26°1′ North latitude and between 90°47′ and 92° 52′ East longitude. It covers an area of 9851 Sq. Km.

The land consists of four plateaux rising abruptly above the low plains of Bangaladesh near sylhet, to a height of about 1200m AMSL at Cherapunji, close to Mawsyanram, the rainiest place of the earth. Another plateau at Mawphlang is located at a higher level towards further north. This is the highest tract within the Meghalaya. Shillong, the capital of the state with its
peak (Shillong peak) at 1956.3m AMSL is included in this part. The altitude of the capital is 1800 m. AMSL. The region inbetween the Shillong and its peak is known as Upper Shillong. Saw Mer, the area under study is situated at 6.4 km. south west of Shillong on way to the Shillong peak. From Shillong the hills lower down towards north, forming two plateaux at different stages. One at the elevation of 1213m AMSL at Barapani and the other at 606.5m AMSL at Nongpuh. After this the Piedmont belt begins, stressing east west and ultimately merged with Brahmaputra Valley in further north.

A striking feature of the drainage pattern of the Shillong plateau is the straight stream courses which follow joints and faults (Mathur, 1968: 14) produced during the uplift. The stiff gorges in the South Khasi Hills is the result of the relatively greater uplift of this block, headward erosion along joints by antecedent streams, and the control exercised by the well-jointed Cretaceous – Tertiary sandstone cover.

**Garo Hills**

The Garo Hills forms the western part of Meghalaya and also the western and southern boundaries of the state. It is situated between 25°9' and 26°1' North latitude and 89°49' and 91°2' East longitude. The total area of Garo Hills is 5043 Sq. Km.

Garo Hills is a dense irregular hilly mass of low elevation forming the western extremity of the Assam Range dividing the valley of Brahmaputra and Surma. The Conglomeration of hills stress mainly with an
east-west orientation rising above the plains, presents a picturesque landscape of mountains, valleys, plateaux and peniplains, added to this, is numerous rivers, streams and other water bodies.

The area has an average elevation of 600m AMSL but gradually increases in height to reach the Tura range which traverses the region from the southeast to the northeast. The two main ranges of the region – the Tura and the Arabella running parallel, extending from Tura to Sijie and Simsang Valley. The Tura range runs almost through the centre of the Garo Hills and it joins with Shillong of Khasi Hills to the east. Nokrak is the highest peak with an elevation of 1411m AMSL is located 12 km. South-east of Tura, the administrative nerve centre of Garo Hills.

The Arabella range is located to the north of Tura range. Whose highest peak is 983m AMSL. The Kailas (1023m) and Balpakram (858.6m) are the two other peaks which are situated on the east of Someswari river.

The Kailas which stands as tower among the hills in the vicinity is regarded by the Garo as Chitamang, meaning the abode of departed souls.

The Balpakram is also regarded as a sacred place by the Garo (Choudhury 1958: 12) The hills are covered by dense forest and the hill slopes by jhum fields.
Climate

The climate of Garo Hills can not be generalized though it is said to be temperate (Majumdar, 1980: 15) in general sense. The area adjoining the Khasi Hills are much colder in comparison to the areas adjoining the plains.

The Garo generally recognize two seasons, wachikari (the rainy season) and arankari (the season when the soil becomes dry). Besides, they have also segmented these major seasons as, balwakari (a part of wachikari: the season of winds, corresponding roughly to April-May) and Su'urikari (a part of arankari: the season of extreme cold, corresponding roughly to December-January). The calander year of Garo begins with a'aokari (the season of opening plots for jhum cultivation), followed by a'asokari (the season of burning the plots), migekari (the season of planting), a'jakra clangkari (the season of first stage of weeding), Sampang dangkari (second stage of weeding), migekari (the third stage of weeding), mirakari (the season of harvesting), dongrokari (the lazyier season) is considered as the best season because the climate during the period becomes pleasantly cool and dry (Majumdar 1980: 16).

The fertility of the soil varies greatly from place to place in Garo Hills. It is the fanning out basins, close to the river mouth, especially confluence of rivers, creeks between the hills are traditionally considered arable for wet cultivation in the higher attitudes. In the lower altitudes it is the piedmont belt that offers more suitable land in the form of flat valleys of small
rivers. As pointed out by Majumdar (1980) these lands are quite advantageous for permanent cultivation, because besides being fertile, “these are beyond the reach of flood waters which seasonally destroy crops in the low lying areas in the plains” (Majumdar 1980: 17). Interestingly, some of the very old nokmas (village headman) inhabiting in the upper reaches of Garo Hills viewed the matter in different way: for them foothills region may be described as a ‘fertile zone’ but from the health and agricultural point of view this could never be considered suitable because of its hazardous affect and subjected to frequent havoc caused by herds of wild elephants.

Soil Type

The soil type of Garo Hills may be divided into two groups on the basis of nature and composition (Goswami, 1956):

i) Soils on the hills proper, and

ii) Soils on the bottom lands.

The soil on the hills are formed according to the availability of rocks in the locality. This, however, predominantly consist either of conglomerate, gneiss or sand stone. It is reddish in colour and usually fine in texture. The conglomerate soils on the hills contains pebbles which are small to medium in sizes.

The soil in the bottom of the hills or near the river valley is formed by transported soils from the hills above.
In texture, they are not uniform, mostly clayey-loam. The colour of the soil ranges from dark grey to black due to presence of organic materials.

Drainage System

Lying in the tropical humid zone, Garo Hills receives sufficient rainfall which facilitate in the formation of many rivers and rivulets. Almost none of the rivers are navigable in true sense, except in its lower courses near the plains. Most of the rivers originate from the Tura and Arabella range. The banks of the rivers, especially towards the upper reaches are densely wooded with creepers, bamboos and other tall trees and virtually no beam of sunlight pierce through the canopy of the forest. This, along with constant roraing of the river make the atmosphere extremely wild, virgin, piquant (plate:3.3.01:p. 128).
The rivers flowing down northward are the Dit, Ringgi, Damring (Krishnai), manda and the Didram. Those following west ward are the Ganol (Kulu), Galwang, Rongkai, and the Dalni. Those following southward are the Sanda, Bugi (Bhugai), Darang (Nitai), Bandra, Sim Sung (Someswari) and Rompha. All the rivers originate in the region itself but it is not easy to follow their courses for a greater distances because of unaccessible banks and deep gorges. The beds of the rivers are quite slippery which consist of huge boulders, gravels and pebbles mostly rounded or oval in shape. The depth varies frequently at a shorter distance and accordingly velocities of the waters vary from high to moderate.

2.4: Map of Meghalaya & its Drainage

Garo Hills, which was rising relatively less, compared to the Khasi Hills; the basement was not exposed, and the consequent streams are mostly controlled by the structures (monoclines and faults) in the sediments. (Murthy, 1968: 14).
The drainage basin of Garo Hills may be divided into two zones:

i) The northern river basin, and

ii) The southern river basin.

In the northern river basin there are at least eleven sub-river basins. The largest is the Damring river and its tributaries. In the south, river basins can be demarcated into fourteen sub-river basins. The largest is the Simsang River and its tributaries.

Lakes and Marshes

The largest natural lake in the region was formed during 1897 earthquake is located at Damring valley (Sharma, 1976). Its depth varies from 3m to 3.6m at places in its 13km length. The other notable lakes (locally know as beel) in Garo Hills are Boro beel and Kata beel.

In the upper reaches there are two lakes – one on the Nokrek hills at the height of about 1213m AMSL and the another at Makbil Bisik at a height of 889 AMSL.

Geology

Meghalaya is characterized by the presence of a wide variety of rock types originated during various epochs of the earth’s evolution from Archaean period (3600myr.) upto the recent times. The various geological formation of the region are: (a) Archaean Gnessic complex with acid and
basic intrusive: (b) Shillong group of rocks (c) Lower Gondawana rocks (d) Sylhet trap, and (e) Cretaceous sediments.

2.5: Map of Meghalaya & its Geology

The general stratigraphical sequence of these rock formations as observed in Khasi and Garo Hills (both are an integral part of Shillong Plateau) of Meghalaya is given below:

1. Archaean Rocks

The Archaean genesis complex which uplifted to its present height of about 600-800m AMSL is exposed on the southeastern part of Khasi hills and northern parts of Garo Hills are believed to be the northeastern extension of the Indian peninsular shield separated by the Bengal plains. It consists of a variety of metamorphic rocks, the common among which are biolite gneiss, biolite granulite, amphibolite, banded magnetic, quartzite, biolite
schist etc. The foliation trend is in the NE-SW direction and they are affected by
two main folding movements earlier one along E-W axis and the latter along
NE-SW axis. These rocks were later intruded by basic igneous rocks.

2. Pre-Cambrian Rock

Aplites, pegmatite and vein quartz are the common rock types,
origin of which is likely related with granite bodies and there may be more than
one phase of granitic-pegmatic activity during the long Pre-Cambrian time.

3. Permo-carboniferous Rocks

In the extreme western part of Garo Hills, near Singrimari a very
small patch of Lower Gondwana rocks gets exposed. The rocks include
sandstone, pebble bed, carbonaceous shale with streaks and lenses of coal and
occasion impressions of vertebrata indices. The sandstone dips westward and is
intruded by dolerite dyke.

4. Jurassic Rocks

Dolerite and basalt dykes are found in the Archaean rocks of
Garo Hills, between NNE-SSW and NE-SW which is nearly coincide with the
grain of the country rocks. Alkali lamprophyre dykes are also found in the
Archaean rocks of northeastern Garo Hills. This probably belongs to the
igneous activity during the Jurassic period. In the western Garo Hills unaltered
dykes of doleritic and basaltic composition intrude the gneisses in the form sills
and dykes.
5. Tertiary Rocks

Sediments of Tertiary origin is distributed all along the southern border of Garo Hills and many other places in the south-western part of the region. The Gondawana sediments is 350myr.

The Shella formation of Jaintia group of rocks consists of sandstone, clay and coal seams followed by the Siju limestone formation.

The Kopili Formation is about 500m thick, overlying the Shella Formation. It consists of alternations of thin beds of sandstone and thick shale beds with sporadic thin bands of fossiliferrous limestone.

The Simsang, Baghmara and Chengapara Formation constitute the Garo Groups. The Simsang formation overlies the Kopili Formation. This consists of cross bedded sandstone altering with siltstone-sandstone units.

The Baghmara Formation overlies the Simsang Formation. It consists of irregular beds of coarse felspathic sand with minor claystone, pebble conglomerate and huge silty clay beds.

The Chengapara Formation overlies the Baghmara Formation. It consists of fine grained micaceous sand, blue to brown sandstone and clays with a thin marly beds at the base.

Over the Chengapara Formation lie the Dupi Tila Group of rocks. It consists of alternations of coarse felspathic sandstone with lenses and beds of pebbles of quartz and sandy mottled clay.
6. Quaternary Deposits

Isolated patches of older alluvium overlie the Tertiary rocks which consists of beds of assorted pebbles with coarse, loose sand and brownish clay. This usually forms, flat topped low hillocks and mounds of red soil cover.

Prehistoric lithic artifacts in Meghalaya has so far been found only within the alluvial deposit at varying depths.

7. Recent Deposits

Recent alluvium is found in the river valleys and flood plains in the foothill region. It consists of fine silty-sand and yellowish brown clay with occasional pockets and layers of coarse sand and rounded pebbles.

The following tables shows the rock formation and types in united Khasi Hills and Garo Hills.
### 2.5: Garo Hills: Rock Formation and Types

<table>
<thead>
<tr>
<th>Geological Age</th>
<th>Group</th>
<th>Formation</th>
<th>Rock Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent</td>
<td>Recent Alluvium Unconformity</td>
<td>-</td>
<td>Yellowish brown, sand, silt clays, Pebbles.</td>
</tr>
<tr>
<td>Pleistocene</td>
<td>older alluvium unconformity</td>
<td>-</td>
<td>Reddish brown sand, clay, pebble and gravel deposit</td>
</tr>
<tr>
<td>Mio-pliocene</td>
<td>Dupi Tila Group unconformity</td>
<td>Chengapara Formation (700m)</td>
<td>Sand, siltstone, clay, marl</td>
</tr>
<tr>
<td>Oligo-Miocene</td>
<td>Garo group</td>
<td>Baghmara Formation (530m)</td>
<td>Felspathic sandstone, pebble conglomerate, clay, silty clay.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Simsang Formation (1150m)</td>
<td>Siltstone, sandstone alterations, sand.</td>
</tr>
<tr>
<td>Eocene</td>
<td>Jaintia Group Unconformity</td>
<td>Kopilia Formation (500m)</td>
<td>Shale, sandstone, marl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shella Formation (600m)</td>
<td>Alteration of sandstone, limestone.</td>
</tr>
<tr>
<td>Jurassic (?)</td>
<td></td>
<td>Sylhet trap</td>
<td>Alkali lemprophyte, dolerite basalt dyke agglomerates</td>
</tr>
<tr>
<td>Permo carboniferrous</td>
<td>Lower Gondwana group</td>
<td>Gondwana rocks of the Garo Hills.</td>
<td>Pebble bed, sandstone, carbonaceous shale, lenses of coal, dolerite dyke.</td>
</tr>
<tr>
<td>Pre-cambrian</td>
<td>Unconformity Acid intrusires</td>
<td>Myllicam granite and its Equivalents Khasi green stone Lava and ash beds:</td>
<td>Gneissic complex Ortho &amp; para-gneisses and schists, granulites amphibolites etc.</td>
</tr>
<tr>
<td></td>
<td>Unconformity</td>
<td>Gneissic complex</td>
<td>Ortho &amp; para-gneisses and schists, granulites amphibolites etc.</td>
</tr>
</tbody>
</table>

*Note: The geological age groupings include recent, Pleistocene, Mio-pliocene, Oligo-Miocene, Eocene, Jurassic, Permo carboniferrous, and Pre-cambrian.*
Important geomorphological evidence of neotectonic activity in the Garo Hills is evident from large-scale stream migration, deranged drainage and rectilinear stream courses (Sinha et al. 1983). The rocks of Garo Hills have been severally affected by monoclines and fault due to tectonic movements. Process of decomposition of rocks, like dolerite occurs at a faster rate due to physical and chemical weathering effect. All the lithic artifacts made of dolerite are heavily patinated. The colour of the patina varies from yellowish brown to brown.

The sequence of rock formations which are recognized in Khasi and Jaintia Hills is given below: (Baruah 1968:27):

Quarts – to urmaline rocks,
Epidiorites
Quartzites
Interformational Conglomerate
Phyllites with shale and talc-chlorite schists
Quartzite
Inter formational conglomerate
Current and cross-bedded quartzite
Basal Conglomerate.

...........................unconformity

Gneiss and schist

Vegetation

While grouping the vegetation pattern of Meghalaya Ahmed (2001) made her study along with the works of other scholars. This is as such: (Griffith 1847, 1848: Hooker 1854, 1872, 1897, 1904; Clarke 1955; Rajkhowa
1961; Rao & Banigrahi 1961; Raju 1964; Rao 1968, 1974, 1977; Hajra 1975; Rao & Kharkonger 1979; Balakrishnan 1981, 1983; Baishya & Rao 1982; Joseph 1982; Anonymous 1984 and Haridasan & Rao 1985, 1987. Based on the works conducted by the aforesaid workers, she further investigated and systematized the vegetation of Khasi and Jaintia Hills as follows. This has been incorporated with the vegetation of Garo Hills, grouped under Tropical Evergreen Forest, Tropical Moist and Dry Deciduous Forests and the Savanna and Bamboo Forests.

![Diagram of vegetation succession in Meghalaya](source: A.A. Ahmed. 2001)

### Tropical Evergreen Forests

These forests are distributed in three tiers at lower elevation near catchment areas in Khasi and Jaintia Hills. All the tiers exhibit dense and impenetrable herbaceous undergrowth. The top tier consists of trees like *Artocarpus fraxinifolius*, *Bischofia javanica*, *Castanopsis indica*, *Cynometra*
polyandra, Dysoxylum binectariferum, Elacocarpus robustus, Firmiana colorata, Lannea coromandelica, Musa ferrea etc.

The second tier is composed of trees like Ficus racemosa, Garcinia pedunculata, Mangifera sylatica etc.

The third tier consists of Goniothalamus simonsii, Ixora subsessilis, Mallotus philippensis, Thevesia palmata etc.

Most of these trees are infested with innumerable climbers and lianas and its branches with dense growth of epiphytic orchids, ferns and aroids.

The lush green vegetation of tropical evergreen forest of Garo Hills forms a rich species diversity. This is composed of trees like Castanopis tribuloides, C. indica, Mesua ferrea, Antidesma acuminata, Phoebe attenuata etc. Some of these trees are tall but with thin bole. Smaller trees like Oreochide integrifolia, Thevesia palmata etc. are also found.

**Tropical Semi- evergreen Forests**

The species under this Forest type is few. It is distributed in the northeastern and northern slopes of Khasi and Jaintia Hills, up to elevation of 1200m AMSL, where annual rainfall stands at 1500cm –2000cm. The species of these forest includes Dillenia pentagyna, D. Indica, Hovenia acerba, Elaeocarpus floribundus, etc. from the top canopy, Symlocos paniculata, Rhus acuminata, Ficus hirta etc. from the second canopy.
**Tropical Moist and Dry Deciduous Forests:**

Deciduous forests are much extensive in Khasi Hills, Jaintia Hills and Garo Hills. In Khasi and Jaintia Hills the important trees of this forest type includes *Shorea robusta, Tectona grandis, Terminalia myriocarpa, Gmelina arborea, Artocarpus chaplasha, Schima Khasiana, Albizia lebbeck* *Croton jaufra, careya arborea, Bridelia retusa* etc.

In Garo Hills this type of forest are dominated by *Schima wallichii, Calcicarpa arborea Alnus nepaleomisis, Byttneria asparia, shorea robusta, Mangiferra indica, Famarindus indica* etc.

Besides these some common shrubs, creepers and herbaceous plants have also been found.

Among these *Berberies wallichiana, Mahonia nepalensis, Agapets auriculata, Leuxifolia, Viola scrpens* etc. are common.

The traditional cultivated plant of the region includes rice, sweet potato, tapioca, chilly, maize etc. Further, the Garo Hills is well known for its high grade cotton production.

**Bamboo Forests**

Bamboo forests in Khasi and Jaintia Hills is not a Common sight in contrary to the other parts of Northeast. This type of forest is not natural but appear in the Jhum falls of 15 to 20 years and often form pure patches at places. (Ahmed 2001).
Bamboo forests are plentifully abundant in all over Garo Hills. Typically, bamboo forests also come up in the jhum fallows of different ages. The common bamboo species are *Dendocalamus hamiltonii*, *D. gigantea*, Bambusa bambos, *Cephalostachyum latifolium*, *Melocanna bambusoides* etc.

**Sub Tropical Pine Forest**

This type of forest is restricted to Shillong plateau in Khasi and Jaintia Hills. Pinus kesiya is the principal species of the forest which coexist with a few broadleaved trees like *Schima khasiana*, *Myrica esculena* etc.

2.7: Map of Meghalaya & its Natural Vegetation

**Temperate Forest**

The site under study (SMR) surrounded by this type of forest. It occurs at an elevation of 1800m and above and is chiefly confined to upper Shillong and Shillong peak (Ahmed, 2001).
The dominant type in this forest are *Rhododendron, Quercus* and *Castanopsis*. The trees are heavily laden with festoons of moss and epiphytes mostly orchids. The forest floor cushioned with a thick humus deposition.

**Grasslands and Savanna**

Grassland is not a climax type but represent seral Community. It is distributed throughout the Shillong plateau. The dominant grasses are *Setaria glauca, Fimbristylis dichotoma, Cyperus sp. etc.*

Another striking aspect of the vegetation the Khasi and Jaintia Hills and also in the Southern Garo Hills is the insectivorous plant, commonly known as ‘pitcher plant’, botanically known as *Nepenthes Khasiana*.

**Fauna**

Khasi Hills is not rich compared to Garo Hills in faunal wealth. Among the animals leopards, wolves, jackals, foxes, wild hog and several kind of deer are found. Among the birds category, hawks, hornbills, parrot, mainah, red jungle fowl (*Gallus gallus*), Himalayan black bulbul (*Hypsipetes madagascariensis*), Red vented bulbul, long tailed broad bill, barbet etc. are common.

Among reptiles include many snakes and lizard. Of which king Corbra (*Naga Lannah*), Indian Cobra, Coral snake, viper, Pithon, green tree racer (*Elaphe Prasminia*), red necked kulback etc. are worthmentioning.
The densely forested hills of Garo Hills have preserved various kinds of wild animals. Species of 35 mammals, 426 birds, 62 reptiles, 14 amphibians and 62 fishes have been recorded (Ghosh 1984: 74).

Among the primates, five species—the gibbon (Hoolack), the Rhesus macaque, capped langur, Assamese macaque and slow loris are found. Of the carnivores, wild dog, large Indian civet, hog-badger, yellow throated marten, tiger, Himalayan black bear, jackal etc. are found. Other animals includes gaur, goral, elephant, barking deer, sambar, porcupine, pangolin malayan shrew, Indian flying fox etc.

The People

Little is known about the history of settlement of the region traditionally known as the Khasi and Jaintia Hills and Garo Hills of Meghalaya. But historically the Khasi and the Garo are believed to be the autochtons to the region. These two ethnic groups though linguistically different, but they share more or less a common cultural configuration so far their matry-centred social system is concerned. For better understanding, let us view the salient features of the two groups of people independently, as they are distributed in two different eco-cultural zones of the area under study.

The Khasi

Like almost all the ethnic groups of Northeast, it is believed that the Khasi migrated somewhere from Southeast Asia. Their language is fairly
well known since later 19\textsuperscript{th} century and at present its speaker stood around ten lacs.

**Physical Features**

The Khasis are physically characterised by a skin colour ranging dark to a light yellowish brown. Head hair is black and straight; it is scanty, on the face. The head varies from long to medium with a trend of high mesocephalic index and high vault. The face is mesoperosopic. The nose is mesorrhine, nostrils large and prominent and the forehead being vertical is of medium height and breadth. Supra orbital ridge is traceable. The eye-slit is somewhat obliquely set and the eye-colour is blackish brown. The nasal depression is shallow and the nasal bridge is concave. The malaris are moderately prominent and of small size. The mouth is large, the lips thick. In stature, the average Khasis are short, with well built body. The people are good-tempered and industrious.

**The origin**

The problem of origin of the Khasi remains in the mist. However, it is almost established that they are quite distinctive in their physical appearance and language forming an island among the Indo-Mongoloid in the Northeast. There is no documented evidence regarding their origin and migration. A general belief based on the legends is that the Khasis entered Northeast from Myanmar via Patkai range – the same route had perhaps been followed by many other tribes in the later times. It is a general agreement that
the Khasi are the earliest migratory to the Northeast and perhaps their habitat in the Khasi and Jaintia Hills antedates the arrival of Indo-mongoloids and other group of people like Dravidian and Aryan inhabited in different parts of the Northeast India.

Another legend based belief which the Khasis prefer to follow is that they liked to be known as the *Hynniew Treps* (Seventh Huts) – a group of seven families out of 16 families, who decided to live on the earth, while the remaining nine families choose to live on the heaven. The later group is known as *Khyndai Hajrong* (Nine Huts).

The Khasis of Jaintia Hills preferred to be known as *Pnars* then as *Syntengs* as it means the backward community who were left behind in their westward migration. (Ahmed, 2001). Whatevsoever, be the implication of these legends, it is the need of the hour to evaluate the things from the Anthropo-archaeological perspective.

**Language**

They speak a dialect known as Khasi which is grouped by Wilhelm Schmidt (1904) with Mon khmer language of Austroasiatic language family¹.

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¹ The Austroasiatic linguistic family is most widespread and geographically fragmented in mainland Southeast Asia. It includes approximately 150 languages in two major sub-groups: Mon-Khmer of the Southeast Asia and the Khasi of Northeast India. The Mon-Khmer subgroup is the largest and contains Mon (in Lower Myanmar), Khmer (in Cambodia) and Vietnamese, besides many other tribal languages, such as Khasi of Northeast, Munda of Eastern India, Nicobaries, the Aslian language of Malaya. It is also believed that Austroasiatic languages were once widely distributed in South China, even as far north as Yangzte river and possibly northern Sunatra (Bellwood 1992:109) Many of the prehistoric sites of Northeast Thailand, such as Non Nok Tha Ban Chang etc were inhabited by speakers of this family.
The present Khasi language varies up to certain degrees from area to area (Ghosh 1992) divided into eleven types according to their area of distribution:

1. Amwi southern Jaintia Hills
2. Shella southern Khasi Hills
3. Warding southern Khasi Hills
4. Myriaw, Nongkhlaw, Nong Pong, Maram; Mawlang mid eastern Khasi Hills.
7. Cherra mid southern Khasi Hills.

Among these groups the most commonly used Khasi dialect is the Cherra dialect.

The Khasis do not have any script of their own in the earlier days.

Bio-cultural Linkage

It is a fact that the Khasis undoubtedly possessed certain archic racial elements like dolichocephalic platyrrhine which according to Haddon is pre-Dravidian and to Dixon (1922:1-3) is Negroid. But its significance may not
be reckoned because of the availability of other dominating physical characters that incline more towards Mongoloids. The later prompts Guha to reconsider the Khasi as Palaeo-mongoloid dolicho-mesocephal type.

The Khasis share a number of cultural elements both with that of Mongoloid population of Northeast India, as well as Austric population of Southeast Asia. Without going into details, here, some of these cultural features in generalized form are given.
2.8: Cultural configuration of North East India and South East Asia

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Cultural features</th>
<th>Northeast India</th>
<th>Southeast Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Preservation of forest as sacred groves</td>
<td>Most prevalent</td>
<td>Prevalent in neighbouring Garo Hills</td>
</tr>
<tr>
<td>2.</td>
<td>Practice of 'Jhum-cultivation</td>
<td>Less prevalent (confined in foot hills)</td>
<td>Most prevalent</td>
</tr>
<tr>
<td>3.</td>
<td>Hoe-cultivation</td>
<td>Most prevalent</td>
<td>Less prevalent</td>
</tr>
<tr>
<td>4.</td>
<td>Use of angled hoe (agricultural implements)</td>
<td>Most prevalent</td>
<td>Absent</td>
</tr>
<tr>
<td>5.</td>
<td>Use of digging stick</td>
<td>Less prevalent</td>
<td>Most prevalent</td>
</tr>
<tr>
<td>6.</td>
<td>Practice of divination either with an egg or a chicken: Studying omens on the yolk of the egg or on the liver of the chicken</td>
<td>Most prevalent</td>
<td>Most prevalent</td>
</tr>
<tr>
<td>7.</td>
<td>Magical charms associated with lime pot</td>
<td>Most prevalent</td>
<td>Uncommon</td>
</tr>
<tr>
<td>8.</td>
<td>Consumption of betel nut with lime.</td>
<td>Most prevalent</td>
<td>Less prevalent</td>
</tr>
<tr>
<td>9.</td>
<td>Erecting of menhir and dolmen (megaliths) in honour of dead</td>
<td>Most prevalent</td>
<td>Prevalent in Garo, Naga &amp; Karbi Hills &amp; Manipur</td>
</tr>
<tr>
<td>10.</td>
<td>Offering of grave goods and food to the spirit of the deceased ancestor.</td>
<td>Most prevalent</td>
<td>Most prevalent</td>
</tr>
<tr>
<td>11.</td>
<td>Neolithic shouldered celts</td>
<td>Prevalent.</td>
<td>Most prevalent</td>
</tr>
<tr>
<td>12.</td>
<td>Lithic Industry of Mesolithic phase: Characterised by points and blade flake</td>
<td>Most prevalent. (exclusive to Hanapuri &amp; Saw M)</td>
<td>Uncommon</td>
</tr>
<tr>
<td>13.</td>
<td>Rhyolite as raw material for lithic industries.</td>
<td>Most prevalent</td>
<td>Uncommon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most prevalent in Vietnam (Hu Van Tan 1976 130)</td>
</tr>
<tr>
<td>14.</td>
<td>The Mon-Khmer dialect</td>
<td>Most prevalent (Schmidt 1904)</td>
<td>Absent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most prevalent (Bellwood 1992 108) in certain pockets</td>
</tr>
</tbody>
</table>
Some of the features outlined above elicit some important and significant dimension of the area under study. Some cultural traits quite distinctive to a population who linguistically belong to Mon-Khmer (Austric) but racially Mongoloid group, make the situation problematic but significant at the same time. The question remain which one is earlier, was the Mongoloid accept the language from Austric group or the Austric transformed into the Mongoloid racial fold. If we examine the ethnic situation of the past, we are inclined to assume that the Austric might have constituted the earlier stratum than that of Mongoloid as revealed by the assemblages of Pre-Neolithic sites of Saw Mer and Barapani of East Khasi Hills.

So far the prehistoric cultural phases are concerned, it is the Neolithic phase which can be termed as a phases of maximum cultural diffusion among the various ethnic groups or bands inhabitated the Northeast. Prior to that each group or band maintained their insular cultural and racial entity.

**Material Culture**

Two distinct cultural phases has so far been identified in the United Khasi and Jaintia Hills. The first phase represents the Mesolithic period and was more or less homogenous in nature. It was restricted mostly to the upper reaches of the Hills. This well-defined phase may be termed, as Sawmerian cultural phase existed around 7th -8th millennium B.C. (Chapter – VII: p.279).
The second phase represents the contemporary Khasi culture is again broadly homogenous in nature and it spreads upto the Foothills belt and across its territorial boundary during the historical past.

In this connection it may also be mentioned that the intermediatery phases are yet to be ascertained, which however, have been represented so far by a few Stray finds of ground and polished stone axes characterized by shouldered and rounded butt. Like other parts of Northeast, this lithic phase may have intruded into the historical (iron using stage) period.

Whatsoever be the cultures of the past and present, the people of Khasi Hills mostly relied upon his bows and arrows for hunting as their chief occupation, followed by gathering. This was a need based economy – a strategy for subsistence. In the later stage the prevailing customs played a major role in changing the economic pattern. So to understand the origin and development of material culture of the people of Khasi and Jaintia Hills, one has to consider at least two factors juxtaposing with the need or requirement and sentiment or psychological aspect of behaviour.

The Megalithic custom has sentimental attachment to the place where family sepulchre and memorial stones stand (Bhowmik 1971:133), the practice of village sacred groves (Ahmed, 2001), less inclination towards jhum cultivation (Bhowmik 1971) perhaps be some of the reasons which make them comparatively less mobile in respect of habitat, in comparison to the other ethnic groups of Northeast. This is a vital factor in the man-land-relationship in
relation to the conservation of forest based economy in a tropical country. On the contrary, the Khasis become more exploitative within a confined area for years together. And that perhaps initially forced them to maintain the habit of preserving at least a plot with essential herbs with the attribution to sacred grove.

The bows and arrows and the spears which were once the chief weapon for hunting, essential to their mode of subsistence gradually becoming less important in the face of enhanced technology and the controlled economy. The more they become biased towards the controlled mode of food production, the more they became tied to a given area of exploitation. The permanent field cultivation become the mainstay of their economic life.

The Khasi is the only major ethnic group in the Northeast practicing hoe-cultivation besides the Apatanis of Arunachal Pradesh in a different situation. Jhum cultivation is almost restricted in the upper reaches of Khasi and Jaintia Hills but it is confined to the foothills belt mostly in Bhoi and Lyngngam area (Bhowmik 1977: 131). This could be a late adaptation to the process as indicated by the ethnographic parallel and other archaeological records.

The traditional method of fishing was by poisoning. Use of nets and bamboo-traps are introduced in the Khasi Hills at a much later date. Community fishing is very popular among them till today.
Traditional mode of securing jungle products like firewood, roots, tubers, fruits and honey are still in vogue. Use of betel nut with lime is highly prolific among the Khasis. Rice is the staple food and the rice-beer is considered as traditional beverage, is also used for ceremonial purposes.

The Khasi houses are made of stone, wood, reeds and straw. Using of iron nail in house building was considered to be a taboo.

The Khasis are good craftsman. They used to make mats from grass, cane and bamboo-splits. They also know the art of making pottery. Potter’s clay is black in colour. The earthen vessels are sometimes decorated with some signs and patterns.

The Khasi is one of the specialized tribes having the knowledge of metallurgy. They procure the raw material from stagnant bogs. The crude iron ore is then smelted and refined in furnaces with the help of piston bellow, built – indigenously.

The Khasi society is characterized by matrilincal descent. They reckon their lineage in terms of their mothers’ clan. Property of a family are owned by the housewife. The Khasi practice tribal endogamy and clan exogamy. They are strictly monogamous. Cross cousin marriage is permitted with certain conditions.
The disposal of dead body is made by cremation. Before cremation they preserved the body for some time in the home following traditional method.

The Khasi religion is monotheistic (Mawrie 1981) which they call *Niam Khasi* or *Niam Tynrai*. They believe in *U Blei Nongthaw* (one Supreme God). He is above gender and above number (Ahmed 2001). The monotheistic Khasi religion later become associated with animistic beliefs such as cult of fertility, worship of mountain and river, spirits, glorification of ancestors, etc. (Gurdon 1914).

**The Garo**

The homeland of the Garo is the United Garo Hills of Meghalaya. According to Sangma the term ‘Garo’ is misnomer, carrying no meaning in their language (1995:33). They call themselves *A' chik mandate*, meaning ‘Hill Man’. The Garo is linguistically related to the other Bodo groups of the Tibeto-Burman linguistic sub-family, such as the Rabha, the Kachari, the Dimasa, the Koch, the Moran, the Chutiya and the Hill Tippera, distributed in various parts of Assam (Majumdar 1980:18).

The Garo language, varies upto certain degrees from area to area based on the changes of morphology, phonology etc. Garo dialects may be divided into nine sub-groups (sub-tribes-according to Majumdar, 1980), as to the area of inhabitance:
1. The awe - foothills- Bajengdoba area (bordering Assam)
2. The Chisak – East Garo Hills- Rongjeng area.
5. The Ambeng – The whole of west Garo Hills.
8. The Atong- East Garo Hills: Siju area (Simsang River Valley).

Among the sub-groups the Atong and Megam are quite distinct from the other sub-groups. The Atong represent an archie from of language and it is unintelligible to the speakers of other sub-groups. On the other hand the Megam is confined to the West Khasi Hills, bordering the district of East Garo Hills. They are known to Khasi as lynggam/Langrin. Both of them maintain marital relationship with the members of other groups.

The Physical Features

The physical characters of the Garo have close relationship with the tribal inhabiting the plains of Assam, North Cachar Hills, Mikir Hills and parts of Tripura. They are generally sturdy people having flat and broad nose, medium or short stature (Bordoloi 1991:13). The average height is estimated at 160cm for the male and 145 cm for the female. They have round and short faces. Complexion ranges from light to dark brown. The man rarely have hair on their face. Lower limbs are generally short (Playfair 1909:23).
The Origin

As to the origin of the Garo, there is no concrete evidence having historical value. The Garo folklores loaded with stories of their migration from Tibet. Playfair that vividly describes the migration of the Garo from Tibet under the leadership of two chiefs, Jappe-Jalingpa and Sukpa-Bongipa (1909: 8-14).

A common root of origin between the Bodos of the Brahmaputra Valley and the Garos of the hills makes the palaeo-ethnic situation of Garo Hills more complicated but significant at the same time from the point of assimilation and distribution of ethnic groups. With the present state of knowledge, it is not the ethnic, but from cultural view point, it can fairly be said that the Garo Hills witnessed successive waves of cultures. This may chrono–culturally be divisible into two broad divisions, viz. the Contemporary cultures of the people of Garo Hills, and secondly, the Palaeo-cultures of the people of Garo Hills.

On the basis of proximity and variation, the contemporary cultures of the Garo Hills has been assigned to atleast nine aforesaid sub-tribes. In this context it is worth mentioning that on the basis of Lexico-statistic Method, Burling and Bhattacharya have estimated the data of separation of the Garo language from original Bodo dialect at about 2000 years ago (1956:67-73). Again, according to Majumdar (1980) the Atong represent the most archic sub-tribe among the Garos and they have striking similarity with the Koch and
the Rabhas in respect of their spoken languages. None of them (Koch and Rabha) are now practicing shifting cultivation, which, however, was in vogue at a few generations ago.

**Material Culture**

So far the prehistoric cultural phases are concerned the picture still remains obscure for the dearth of data on the palaeo-linguistic and biological prehistory. However, the present state of knowledge, lead us to infer that the earliest process of colonization in Garo Hills began during the Mesolithic period. During that period two distinct cultural bands under a common cultural banner the Hoabinhian, had been operating in Garo Hills in a more or less contemporary time plane (Chapter-VII: p.288-289). These two cultural bands, might have got later on sub divided into a number of sub groups and the process reached to its zenith during the neolithic time as revealed by divergent material contents distributed in whole of Garo Hills. Though divergent in nature, the material cultures of all the sub groups point towards the shifting mode of cultivation as mainstay of economy in the Garo Hills. This phenomenon has been persisting even today. The change that took place is not in form but in raw material. Previously it was stone and now it is iron.

Unlike the other hilly tribes of Northeast, who set up their village high up in the hill slopes, the Garo preferred undulated valleys in the hills for their settlement, preconditioned by regular source of drinking water, natural protection from wind and other external forces and also the availability of
suitable land for jhum cultivation. They live in small hamlets and near the village a sacred space called *asong* is left undisturbed where memorial stones are often erected.

A Garo often possesses two houses. One in the village and the other in his jhum field. The field houses called *borang* are built high up in the trees to watch and to protect the agricultural field and himself from the wild animals. The Garo houses are constructed on hill slopes. The platform is resting on the piles maintaining uniform horizontal level of the platform. The house is built of bamboo, strengthened with log and wood and secured with cane and bamboo slip.

Virtually no means of transportation was available in Garo Hills except human energy. Travelling of all sort, was made on foot. Rivers are not navigable in most places. But in a few instances the dug out canoes are put to use by the Atong of Baghmara area (Southern Garo Hills). Occasional use of bamboo raft for fishing in West Garo Hills is also seen.

There is no animal traction. They carry their load in carrying-baskets, made of bamboo and cane of different shapes and sizes, for various purposes. These are *Kera, Kokreng, Koksi, Kokchikok, pachi, Jengkok, donceng* etc.* washing*-bamboo tubes, gourds of various species (raised as venti cultural items) are also used as container for liquids.

For gathering as well as agricultural purposes the Garo use *da* (broad bladed chopper): *ate* and a'te *mongren*; long stick with a hook like
projection: *angusing*; *Gitchi-hoe* with iron blade with bamboo handle and *matha*-digging stick.

To supplement the horticultural economy, the Garos have to exploit a wide range of natural items, non derelict types. They gather different parts of plants such as the roots, tuber, stem, leaves shoot etc. Some are eaten raw, while others are consumed by soaking, boiling, roasting, grinding or other special preparation. They extensively used *Kalchi* (alkali: prepared by burning plantain stem), salt and chilies in cooked food. Wild plants are gathered mainly for food and for medicinal uses. Among the important items mention may be made of *Bambusa tuida*, *Amarophalus companulatus*, *Alpina allughas*, *Bauhinia variegate*, *colocasia esculenta*, *curcuma aromatica*, *Dioscoreta alata*, *D. bulbifera*, *D. hispida*, *Ipomoea batatas*, *Manihot esculentus*, *Tamarindus indica*, *Solanun ferox*, *Momordica chararitia* *Manihot esculentus*, *Leucas linifolia*, *Syzygium jambos*, *Solanum ferox*, *Psidium guajara*, *Chenopodium album*, *Canavalia gladiata*, *Typhonium trilabatum*, *Zingibera casumunar* etc. (Sharma, 1995).

Hunting played a less important role in Garo Hills for subsistence during the past and in present time. In this context the remark made by Playfair is worth mentioning, “...although the hills are so full of games, the Garos knows very little about hunting and tracking” (1909). This seems to be an echo of prehistoric past. It may be surmised that here the various cultural bands operating during Mesolithic period were more biased towards foraging and food producing than that of hunting. The archaeological data under this study
lend support to the above inference. (Sec : p.284-285 & 288-289). The remark made by playfair (1909) attests the continuation of the Mesolithic past to the early period of twentieth century.

Whatever may be the situation, the Garo shows ingenuity in setting up of certain traps and snares based on ‘tension and lever-released’ principle. Besides, they also apply some other devices, such as by spears – salu pasrok (iron-headed bamboo spear, having no mid-ridge on the blade), Salu-dikil (having mid-ridge) and Salu (without iron head: pointed split bamboo to act like a spear), bra-chre (bow and arrow): made of bark-string and bamboo and with or without iron-tip, bra-dona (Booby trap), Matcha nol/dengrip chaka (Cage trap): for tiger and other big games, baga chaka (noose trap), gongsot Sa’a (bailed noose trap) and jal (net). Pitfall and stockade methods are also known to them.

Fishing is another important corroborative activity in the subsistence strategy of the Garos. It is executed by bare hand, by poisoning water, and by implements. For poisoning they used ruti (fruit of Randia dumetorum), roots (makal) and the bark (rubok) of Barringtonia acutangula (Sharma 1995).

The fishing implements include various type of basket-traps, spears and nets. The fishing traps are: asok (automatic trap), Silcha (valveless), Simpach & Ripokpea (valved) and Chempa (double valved). Cho’ong and
Kusa (mono and multi-dented spears) are also used by Garos for catching fish in water current of high velocity.

The practice of making simphak (bark cloth) from the bark of tree Phakram (Trema orientalis) is considered to be the survival of Mesolithic element. The use of animal hides for clothing or such other purposes was not in vogue in Garo hills since Mesolithic period as indicated by the rare occurrence of skinning tools in archaeological context (Chapter V & VII).

The Garos are traditionally animists. There is a Supreme being called Tatara-Rabuga. They believe that earth was created by Nostu-Nopantu under the command of Tatara-Rabuga. Saljong is the Sun-God in whose honour, the Wangala-the prime festival of the Garos is celebrated. Besides, there are many manevolent and benevolent Gods and Spirits.