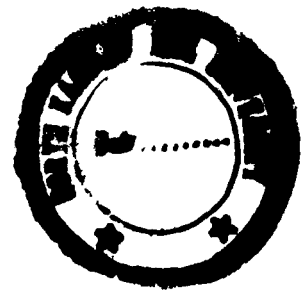


A BIO-SOCIAL DEMOGRAPHIC STUDY AMONG THE WAR KHASI
OF MEGHALAYA

BY

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DISSERTATION SUBMITTED IN PART-FULFILMENT FOR
THE DEGREE OF MASTER OF PHILOSOPHY
IN ANTHROPOLOGY



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CERTIFICATE

I certify that the Dissertation entitled 'A BIO-SOCIAL DEMOGRAPHIC STUDY AMONG THE WAR KHASI OF MEGHALAYA' submitted by Mr. Romendro Khongsdier for the degree of Master of Philosophy in Anthropology of the North-Eastern Hill University embodies the record of the original investigation carried out by him under my supervision. He has been duly registered and the Dissertation presented is worthy of being considered for the award of the M.Phil Degree. The work has not been submitted for any degree of any other University.

Dated Shillong,
The 26th June, 1991.

A. J. M.
Supervisor of Research.

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(R. Khongsdier)

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CHAPTER I: INTRODUCTION

1.1. Anthropological Study of Population

Physical anthropology is primarily concerned with the study of man as a physical organism in both time and space. Its main objective is to understand the processes of human evolution at both micro and macro levels as well as to find out human variations and the causes of such variations. Till the middle of the present century, the physical anthropologists were largely involved in taxonomic classification of human populations. They mostly used anthropometric techniques. But since the middle of this century, they have shifted their interest from taxonomic research to population genetical research with a view to finding out human genetical variations and understanding the causes of variation and the various processes of human evolution. They have been gradually realising that along with anthropometric, serological and other techniques, emphasis on demographic research could be beneficial to the study of human evolution and variation. Moreover, anthropological study of population is likely to bring to light some useful estimates of general population trends, which are very useful supplement to the formal demographic research and socio-economic planning (Macfarlane, 1976; Raja, 1960; Nag, 1977; Mukhopadhyay, 1981). Thus, physical anthropology and demography, though the latter generally involves large scale of data with sophisticated-statistical techniques, are closely inter-related. Demographic variables, like fertility and mor-

tality are of great importance to the study of anthropological genetics to understand various micro-evolutionary processes. For instance, selection is believed to be one of the major evolutionary forces that brings about changes in the genetic make-up of a population and operates through differential fertility and mortality. It is true that no specific discipline of science is traditionally known as 'demographic genetics'. But in the field of population genetics one deals with those aspects of genetic processes which need consideration of some demographic parameters. In that sense, population geneticists traditionally consider all those population properties, on which the discipline of demography is conceivably concerned. In this dissertation, we shall look into various demographic parameters of a population, taking into consideration some biological as well as social aspects.

In 1964 and subsequently in 1968, the World Health Organisation (WHO) suggested that there was an urgent need to carry out population genetical research among the primitive groups. It has been reported that many of the primitive communities have been facing with an immediate threat of disintegration of their culture owing to increasing contact with more advanced societies (WHO, 1968). Prior to the WHO's concern about the primitive groups many scholars like Lasker (1952), Eaton and Mayer (1953), Roberts (1956), and some others have diverted their keen interest in understanding the demographic

structure of the primitive communities from population genetic point of view. In India, since 1960, some stray researches on demography, at micro-level among some of the primitive societies, have been carried out mostly in the eastern, southern and northern parts of India (Basu, 1969; Ghosh, 1970, 1972 and 1976; Basu et al., 1980; etc.). Recently (1989), the Anthropological Survey of India has brought out a volume on genetical demography of various Indian populations. In the above mentioned volume, except one or two studies in the north-eastern India, most of the studies are concerned with the populations in other parts of the country. It seems that so far, the researchers have not been taking sufficient interest in the populations of north-eastern region of the country, where hundreds of small primitive groups of people reside since time immemorial. It is, of course, true that some anthropologists have carried out some valuable researches with limited purposes in some of the populations of north-eastern region (Das, 1962; 1978 a; 1978.b, 1978-79; Mahendra, 1969; Das and Baruah, 1974; Phookan and Bazarbaruah, 1980; etc.). They mostly worked on anthropometry, dermatoglyphics, serology, abnormal haemoglobins, etc., and hardly anyone had taken interest in genetical demographic studies among the indigeneous populations of this part of the country.

With this end in view, we propose to undertake a study on bio-social demography among the War Khasi of

the East Khasi Hills district in Meghalaya. By 'biosocial demography', we mean to undertake a study on demographic structure of a population with special reference to some socio-economic factors like education, economic condition, mating pattern, etc. and thereby to understand the genetic implications of such parameters.

1.2 Objectives of the study

The objectives of the present study are as follows:-

- a) To describe the demographic structure of the War-Khasi - both Christian and non-Christian ;
- b) To find out how far the rule of clan exogamy is operating among the Christian and non-Christian War Khasi;
- c) To find out the effects of some socio-economic factors, such as education, economic condition, age at marriage, marriage pattern, etc. on the reproductive behaviour of these two sections of the War Khasi population;
- d) To determine the rates of infant mortality and reproductive wastages in these two sections of the War-Khasi;
- e) To find out the rate of admixture with other Khasi and non-Khasi groups;
- f) To find out how evolutionary forces, like selection, drift, etc. are acting on these two sections of the War Khasi;
- g) To determine the marriage distance and its genetic implications;
- h) To compare the present findings with the existing data on other Indian and non-Indian populations as far as possible.

1.3. AREA OF STUDY

Location and Topography

Meghalaya is essentially a tribal state, which came into existence on 21st January, 1972. Initially, it was a part of Assam and it was composed of only two districts, namely, the United Khasi and Jaintia Hills district and the Garo Hills district. At present, there are five districts, namely, Jaintia Hills, East Khasi Hills, West Khasi Hills, East Garo Hills, and West Garo Hills districts in Meghalaya (Fig. 1).

The War Khasi mostly live in the southern slope of the East Khasi Hills district of Meghalaya. The district covers an area of 5,196 sq.Kms. It is bounded by Assam on the north, Bangladesh on the south, Jaintia Hills on the east and West Khasi Hills on the west. The district lies between 25° N and 26° N latitudes and 90° E and 92° E longitudes. The district headquarters is Shillong, which is situated about 1510 metres above sea level, and it is also the capital of the State.

The southern slope of the East Khasi Hills

district is also known as the War country (Ri War). It extends from Dawki on the east to Balat on the west. It is situated between the central upland region and the plains of Bangladesh. The area is characterised by hill slopes and precipices, beautiful platforms and waterfalls. The famous platforms are Sohra (1337 m), Mawsynram (1305 m) and Pynursla (Zimba, 1983).

The important rivers in the War area are Umngot, Khasmar, Umrew, Umiam, Khasimara, Khuba, etc. These rivers have created the deep valleys through cretaceous sandstones and hard rocks, while flowing towards Bangladesh.

Geological Composition

The important geological feature of the War country is its main composition of sandstone and gneiss rocks. It is said that the submetamorphic rock of the central region or upland Khasi hills is connected with the outburst of volcanic trap, known as the 'Sylhet trap', which is the result of basaltic lava flowing of the Deccan (Zimba, 1983). This trap is close to the Dawki-Shellia fault. Zimba describes that the 'calcareous or chalky rocks which contain coalfields and limestones in alternating strata of compact rocks are transitional nummulities'.

The War area is very rich in limestone and coal deposits. Limestones are found to exist in the whole area of southern slope from Lubha river on the west to Umngot river and southern parts of the Jaintia Hills dis-

trict on the east. The Commorrah quarry near Bhologanj is very well known for its supply of limestone to Assam-Bengal factory at Chattak, now in Bangladesh. Coal deposits of the War area are found in Mawlong, Mustoh, Mawsynram, Madon, Langrin, Langkyrdem and Pynursla. Petroleum is also found to exist in the valley of Khasimara river on the west of Shella village. (Das Gupta, 1984).

Climate

The climate is wet and warm during summer (May - September) and dry and cold during winter (October-April). The average temperature ranges from 30° to 34°C during summer and it drops to as low as 5°C during winter. The average annual rainfall in the Khasi Hills district is about 7090 mm (Zimba, 1983). According to annual record of rainfall in 1974, Sohra (Cherrapunjee) experienced about 967 inches or 24,554 mm. Thus, Sohra and its adjoining areas are well known for having the heaviest rainfall in the world.

Flora and Fauna

The important flora of the area include teak (*Tectona grandis*), oak (*Quercus serrata*), Pooma or Diengbti (*Cedrela toona*), rubber plant (*Ficus Religiosa*), Upas (*Rhus succedanae*), palm tree (*Fenix dactilifera*), bay leaf (*Betula acuminata*), arecanut (*Aerica catechu*), simul tree (*Bombax malabarica*), orange (*citrus aurantium*), mango (*Mangifera indica*), jackfruit (*Artocarpus integrifolia*), guava (*Oissidium guava*), papaya (*Carica papaya*), pine apple (*Bromelia ananas*), pan leaf (*Buclandia populnea*),

pepper (piper betle), pitcher plant (*Nepenthes Khasiana*). Other flora like *thysamolanena Maximus*, *cinanamomum zelandicum*, *quercus spicata*, *citriodora*, *bacaria sapeda*, *sapindus mukorosi*, litchee, chestnut, orchids, species of ferns, mosses, fungi, lichens, etc., are also found in the War country.

The area was once a sanctuary of various types of wild animals. But owing to the practice of jhum or shifting cultivation and merciless killings of animals, most of the fauna have now become very rare and many of them have become extinct. The fauna that are found at present, are leopard, bear, deer, mongoose, small rodents (locally known as Brai), otter, monkey, squirrel, wild fowl, crow, myna, pheasant, etc.

1.4 THE PEOPLE

Distribution

The people of Meghalaya are mostly tribals, among which the Khasi and the Garo are the most dominant groups. Besides these two tribal groups, other tribal populations like the Naga, Mizo, etc., along with some Hindu caste and Scheduled Caste populations, Muslim, Nepali, etc. have also settled in the State. According to 1981 census, the total population of Meghalaya is 13,35,819. The density of population is approximately 60 per sq. Kms. The overall sex ratio is slightly high (104 males: 100 females).

The total population of the East Khasi Hills district, according to 1981 census, is 5,11,414. In the East Khasi Hills district, the most dominant group is the Khasi, which include the Khyntiam, Bhoi and War, and each of them is by and large endogamous in nature. It may, however, be mentioned that inspite of being endogamous in nature, they have at times some marital relations with other communities like the Garo, Assamese, Bengali, Nepali, etc.

The entire southern slope of the district is dominated by the War Khasi population. The area consists of more than 250 War Khasi villages.

Occupation

The main occupation of the people in this area is agriculture. The major agricultural products include paddy, arecanut, bay leaf, orange, lemon, banana, guava, ginger, turmeric, etc. Some people are also engaged in business and services. Some other have trade and commerce relation with the Khyntiam (Upland Khasi or Khasi proper) and others mainly at the centres like Shillong, Balat, Shella, Sohra (Cherrapunjee), Langkyrdem, Pynursla, Dawki, etc.

Physical Characteristics

From anthropological point of view, the Khasi or Khyntiam, Pnar, Bhoi and War belong to the Mongoloid racial stock (Das, 1978-79). These groups follow the

traditional-matrilineal pattern of society and linguistically they speak different dialects of the Monkhmer language, which belongs to the Austro-Asiatic group (Das, 1978). Haddon (1929) describes the physical features of the Khasi as Asiatic Xanthoderm, having cephalic index of 786, nasal index 86.00 and stature 1.569 m. He further states, "It may be tentatively suggested that there is an ancient dolichocephalic platyrrhine type (Pre-Dravidian) which is strong among the Khasi.... " In describing the physical characteristics of the Khyntiam, Pnar, Bhoi and War, Das (1978b) says that these four divisions do not deviate much from the average Khasi in relation to stature and trunk height. He, however, points out that the "Pnar and the Bhoi show most often deviation in higher magnitude and that these two populations are standing opposite to one another in relation to average Khasi". It may be mentioned that the people have so far treated the Khyntiam, Pnar, Bhoi and War as one and the same ethnic group. Marwein (1987) says that the Khasi are "known sometimes by different names at different places. The names are either confined to a particular Syiemship or state or a particular geographical region". In this connection, it may be recalled that the State Government has reserved about 80% of the jobs for the scheduled tribes of which 40% are meant for the Garo and another 40% for the Khasi. But there is no mention about the Khyntiam, Pnar, Bhoi and War. However, at present, the Pnar or Jaintia claim a separate ethnic identity for themselves, and they do not like to be considered an offshoot of the Khasi. There

is also a demand for creating a separate Jaintia State (Dongmusa, Vol. 19, July, 1990).

Rule of Inheritance

Among the War Khasi, the rule of inheritance is one of the most peculiar aspects of social organisation. It is generally known that both sons and daughters inherit the parental property (Gurdon, 1990; Cantlie, 1974; Bareh, 1974; Das Gupta, 1984; etc.). It may, however, be mentioned that this practice is mainly prevalent among the War Shella and some parts of the War Sohra. The other War Khasi living in Balat, Pynursla and Dawki areas, do not practise this pattern of inheritance; but they follow the custom adopted by the Khyntiam, which shows that the daughters (the youngest daughter gets the lion share), but not the sons, inherit the parental property.

Religion

The War Khasi have been in contact with different people of different religious faiths from time to time (Das Gupta, 1984). The arrival of the Christian and Hindu Missionaries, particularly in Shella area, has brought about a tremendous change in traditional religion and beliefs of the people. At present, there are three distinct religious sections in the War Khasi. These are as follows:- (1) **Seng War Khasi** - believer of traditional religion (this term has been used for the convenience of the present study, though the people use to call the name of their religion as 'Khasi'); (2) **Christian War**

Khasi - believer of Christianity, and (3) **Hindu War Khasi**-believer of Hinduism. Of these three religious groups, the Seng War Khasi and the Christian War Khasi are the most predominant sections in the War Khasi. The spread of Hinduism among the War Khasi is mostly restricted in Shella and in some parts of the War Sohra. The Christian War Khasi are divided into different sections, like the Presbyterian, Roman Catholic, Church of God and Fellowship.

The people, who are still following their traditional religion, are actually monotheistic. They believed in one Supreme God, the Creator and Master of universe (**U Blei Nongbuh Nongthaw**). They also believe in life after death and in the presence of good and evil spirits (Marwein, 1987). Breaking of eggs and sacrificing of animals like fowls, pigs, goats, etc. are their important religious rites. The priest, who is locally known as, '**U Nongknia**', performs all these religious rites and ceremonies. They do not have any religious scripture or any common place of worship, like the Churches in case of the Christians. It may, however, be mentioned that the movement for revivalism of the traditional religion has already started among the War Khasi.

Marriage Practice and Clan Exogamy

Monogamy is the general practice of the War Khasi. According to Gurdon (1990), this pattern of marriage is prevalent among the Khasi due to matriarchal system of the society. Though, the War Khasi do not

strictly prohibit intermarriages between other Khasi groups, like the Khyntiam, Pnar, Bhoi and Lyngngam; yet village endogamy is more frequent. Marriages with other populations or communities, like the Garo, Mizo, Naga, Bengalee, Nepali, etc. also take place at times.

Another important feature of the marriage practice among the War Khasi is that one cannot marry within one's clan. The clans are strictly exogamous and this rule is observed by both the Christian and non-Christian War Khasi (Cantlie, 1974; Das Gupta, 1984; etc.). Marriage with maternal uncle's daughter or father's sister's daughter is prohibited (Gurdon, 1990). However, marriage with maternal uncle's daughter is not theoretically forbidden, especially after the death of the maternal uncle (Das Gupta, 1984).

Education

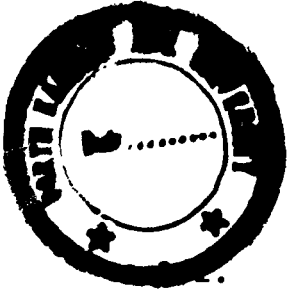
According to 1981 census, Meghalaya is the second lowest state of the north-eastern region in literacy rate (34.08%). It is indeed very surprising because the modern education system started in the state, right from the early part of the nineteenth century. Among the War Khasi, it is observed that in all villages, there are primary schools, and in some villages, there are also Middle and High schools.

Relation with other neighbours

The War Khasi are surrounded by the Khasi proper (Khyntiam), people of Bangladesh, Pnar and Lyngngam on the north, south, east and west respectively. Social

contacts with these neighbours are always through trade and business transactions, mainly at the centres, like Balat, Shella, Sohra, Pynursla, Majai, Nongjri, Hatthymmai, Lyngkhat, Dawki, etc. It may be mentioned here that the War Khasi, who are always in contact with the Pnar, are those who inhabit in Pynursla and Dawki areas. Similarly, the people who are in continuous contact with the Lyngngam are those who live in the western part of the War country or Balat area. The War Khasi are dependent on the Muslim and the Hindu of Bangladesh for the supply of fish, egg, fowl, utensils, etc. In turn, they sell to the neighbours timber, arecanut, bay leaf, pan leaf, orange, lemon, ginger, etc. These local products are also sold at Sohra, Shillong, Pynursla, etc., where they frequently meet with the Khyrniam and others. It is also from these centres that they purchase rice, cloth, and other essential commodities.

With this little introduction about the War Khasi, we may now see what types of demographic researches, particularly genetical demographic researches have so far been carried out among the various populations of this country and elsewhere.



CHAPTER II REVIEW OF LITERATURE

In this chapter we shall try to make a short review of the existing literature on demographic research as far as possible.

Bio-demography

Some studies on genetical demography have been published by many scholars among the different tribal and non-tribal populations, both Indian and non-Indian (Lasker, 1952; Eaton and Mayer, 1953; Cavalli-Sforza, 1966; Johnston et al., 1969; Nag, 1962; Das et al., 1980; Gupta, 1980; Sahu, 1983; etc.).

It is well known that the demographic variables, like fertility, mortality, etc. are the fundamental events of the natural selection, which is one of the major evolutionary forces that brings about changes in genetic make-up of a population. So, many studies have shown that the fertility and mortality components are directly responsible for the rate and direction of human evolution (Wright, 1983; Cavelli-Sforza, 1962; Crow, 1958; Newman et al., 1937; Clark and Spuhler, 1959; Damon and Thomas, 1967; Morgan, 1973; Spuhler, 1959; Basu, 1969; etc.).

Crosse and Mackintosh (1954) have reported that mothers having five or more pregnancies are likely to have higher prenatal death rate. Similarly, Pennington and Harpending (1988) have suggested that women having more than one marriage, have a higher infant mortality rate. It is further suggested that mortality rate of the male offspring is always greater than that of female chil-

dren (Stern, 1960; Teitalbaum, 1972).

Brawn and Wray (1974) have described that mortality is lower when the birth interval is longer. Moreover, the mothers with repeated pregnancies need high quality of protein which is poorly met in many developing countries. Thus, in these countries, we generally meet with 'maternal depletion', which contributes to the low birth weight and early deaths of the offspring.

Roberts (1956) has presented the demographic structure of a Dinka village in southern Sudan, which is characterised by a fairly high sex ratio, moderate fertility and mortality. The role of genetic drift in this population is found to be important. He has suggested that the "smaller the social unit, the greater is the frequency of marriages with outside units". He has also pointed out that there are some effects of social institutions, like marriage practices, etc. on demographic structure of a population.

Basu (1969) argues that the study of isolated breeding populations has important evolutionary implications. But before taking a population for a genetical study, the limit of a breeding community, such as social, economic, religious, geographical, etc. should be taken into consideration. He has worked among the Pahira population of Ajodhya and Dalma hills and has reported that this population as such is not one endogamous group, but

it is composed of three sub-endogamous units among which the impact of several natural forces varies.

Srivastava (1989) says that variation of temperature in particular season may influence the mobility of the sperms and thereby affects fertility. He has also suggested that reproductive wastage is likely to be more frequent, where marriages are practiced within the same village or in shorter distance. Moreover, the infant mortality may be high in such populations because there is a likely recombination of similar genes.

Basu et al. (1980) have presented the demographic structure of a small Christian population in the village Mirpur in Coastal Midnapore district of West Bengal. It is reported that the age structure of the population indicates a growing population trend; but the population pyramid shows a recent decline in fertility. The infant mortality rate is lower in Mirpur as compared with that of West Bengal and other Indian populations. The index of total selection intensity is very low in comparison with other populations. The coefficient of breeding isolation is also low, suggesting that the drift may play an important role in this population.

Ghosh (1976) has reported that the Kota of Nilgiri hills is characterised by a low rate of fertility and a high rate of infant mortality. In the Kota, the frequency of consanguineous marriages is high and thereby

it shows the high coefficient of inbreeding. The coefficient of breeding isolation indicates that the genetic drift plays an important role in bringing about differentiation in this population. Selection is also found to operate with a moderate intensity.

Mukhopadhyay (1981) has carried out micro-demographic study of the two caste communities, inhabiting in the neighbouring areas of Balaramchak and Bamanchak in Coastal Midnapore district of West Bengal. It has been reported that fertility tends to decline in both the settlements. Selection is also found to be sensitive in both the communities.

Das et al. (1982) have reported that the people of Lachen and Lachung, the two isolated Himalayan populations in northern Sikkim, have shown their differences in fertility and mortality rates. The Lachen population has lower fertility and higher mortality rate than the Lachung. It is suggested that the lower frequency of polyandry may result in high fertility and lower mortality in the Lachung. It is also found that the genetic drift is a strong force in these two populations.

Sirajuddin and Basu (1984) have presented some demographic variables of the Chenchu population of the Nallamalai forest hills in Andhra Pradesh. It has been described that this tribal population is characterised by a high rate of fertility with a low rate of infant

and child mortality. The total index of Selection intensity is more towards the middle range reported among the tribal and non-tribal Indian populations. The mortality rate is higher in case of consanguineous marriages, which corroborates with those findings in France, Japan and the U.S.A. (U.N., 1962).

Sarkar (1989) has reported that among the Bhill and Garasia of Rajasthan, the fertility as well as the mortality rate is high. He is of the opinion that high rate of infant mortality may be due to shorter birth interval, diseases, etc.

Turning to the north-eastern region of India, Das (1989) has pointed out that the mean number of live-births among the Shyam women of Khamiyung and Tarung villages in Sibsagar district of Assam is higher than that of the Christian and non-Christian Khasi as reported by Nag (1965).

Barua (1983) has presented the demographic structure of the Hajong of West Garo Hills district in Meghalaya. In comparison with other tribal populations in other parts of the country, the Hajong seems to have a higher fertility rate with a lower rate of mortality. He has reported that selection is operating with a moderate intensity among the Hajong.

Deka (1989) has found that the Jaintia of Saphai village in the Jaintia Hills district of Meghalaya

have a fairly high rate of fertility with a low rate of infant mortality and selection acts with moderate intensity.

In fact, there are plenty of papers on biodemography, which deal with one or the other aspects of demography and how the different trends of genetic implications of such demographic parameters. In this brief review of literature, we have tried to highlight some of the facets of biodemography.

2.2. SOCIAL CORRELATES

The effect of various social parameters, such as economic condition, education, age at marriage, marriage pattern, etc. on fertility and mortality have been reported by many authors (Pearl, 1939; Lorimer et al., 1954; Davis and Blake, 1956; Hauser, 1959; U.N., 1967; Bogue, 1969; Mandelbaum, 1974; Mosley, 1978; Mitra, 1978; Husain, 1970; Nag, 1981; Bharati, 1981; etc.).

2.2.(a) Economic condition:

The effect of economic condition on fertility is generally known (Jain, 1939; Sinha, 1957; Simon, 1969; Hull and Hull, 1970; NSS, 1970; Dutta and Seal, 1974; Mitra, 1966a; UN, 1976; Smith and Ward, 1984; Caldwell, 1977; Schultz, 1986; Gulati, 1988; etc.).

The World Bank (1974) has shown the differences between high income countries and low income coun-

tries in the level of fertility. It is found that the average fertility rate and the average gross reproduction rate of the low income countries are about two times higher than those in the high income countries. The countries in East Asia, like china, Sri Lanka, Phillipines, etc. have shown a rapid decline in fertility rate owing to change in economic structure (Rao, 1976).

The inverse relationship between fertility and economic condition in the USA has been reported by Freedman (1963), Westoff (1986), etc. It is found that fertility rate is lower among the higher economic groups.

This negative relationship between fertility and economic condition has also been reported by many authors in India (Jain, 1939; Mitra, 1966a, 1966b, 1978; NSS, 1967, 1970; Bharati, 1981; etc.).

Sinha (1957) has suggested that families in the high income class have a lower fertility rate than those belonging to the lower income class. Mukhopadhyay (1981) has pointed out that the population with better economic condition tends to have a lower fertility rate. Basu et al. (1981) have also made a similar observation, while working on some small populations of West Bengal.

In central India, Driver (1963) has reported that economic status has some indirect effects on fertility. But Jorapur's (1967) study on fertility of Dhurwar has indicated higher fertility rate among the high income

group than that in the lower one. Agarwala (1970) has also shown that the fertility rate in rural areas near Delhi does not vary with the income levels. Thus, several studies on the effect of economic condition on fertility indicate such contradictory results.

Jain (1975) says that the result "on occupational fertility is fragmentary and inconclusive". He has suggested that further studies should be carried out in order to understand the effect of occupation on fertility, particularly among the agriculturalist groups.

The effect of economic condition on mortality has also been revealed by many studies (UN, 1962; NSS, 1962, 1970; Stockwell, 1962; Frisancho et al., 1976; Mitra, 1978; Rodgers, 1979; Blaxter, 1981; Rajalakshmi, 1981; etc.).

Woodbury (1925) in his study on infant mortality in the USA have concluded that the infant mortality rate is high when the father's earning is low, and vice versa. Greendy and Lewis-Fanning (1967) have also reported that in 15 areas of England and Wales during 1950s, the infant mortality rate is high in those families with poor economic and hygienic conditions. But the World Bank (1974) has described that a decline in mortality rate is independent of economic development. The World Bank has further suggested that the decline in mortality rate in many developing countries is mainly due to development in the pu-

blic health and disease control measures.

Turning to the Indian situation, the NSS (1970) has shown that in urban areas the infant mortality rate is high when the per capita income is low. Similarly, Verma (1977) has observed that the Santal with better economic condition have lower fertility and mortality rates than those found in the economically depressed Bihar .

Srivastava and Saksena (1981) have suggested that the father's occupation and monthly income may have some effect on infant mortality rate. Cross (1982) has also pointed out that when status and position of women are improved, the birth rate tends to decline.

3.2(b) Age at Marriage

Many studies have indicated the effect of age at marriage on fertility (Bumpass, 1969; Mandelbaum, 1974; Mahadevan, 1979; and others). In Japan, Dore (1953) has reported that the fertility rate tends to decline with the increase in the mean age at marriage. Kono (1986) has also observed that in Japan, the higher age at first marriage brings about a decline in fertility rate. He has indicated that the socio-economic factors also play an important role in bringing about changes in age at marriage. Similarly, in Great Britain, Peel (1970) has observed that there is an inverse relationship between fertility and age at marriage.

In India also, some studies have revealed that the decrease in fertility rate occurs concomitantly with the increase in mean age at marriage. Balakrishna 1951; Majumdar, 1960; UN, 1961; Mukherjee, 1962; Agarwala, 1962; Driver, 1963; Agarwala, 1964; Gulati, 1969; Myon and Gordon, 1971; Raman, 1973; Goyal, 1974; World Bank, 1974; etc.).

Das (1969) has suggested that the women, marrying between 20 and 24 years of age, have more or less similar fertility rate to those marrying before the age of 20 years. But there is a decline in fertility rate when marriage takes place at the age of 25 years and above. Vig (1976) is also of the opinion that the rise in age at marriage may lead to a shorter period of reproductive life span, and thereby it may reduce the fertility rate. But it may also be noted that studies carried out by Dandekar (1959), etc. have shown that the rise in age at marriage does not really bring about any decline in fertility rate.

Husain (1970) has observed that the rise in age at marriage has, of course, ^{has} an inverse effect on fertility; but educational status has a great influence on the age at marriage. Some studies also show that the age at marriage is associated with socio-economic development and thereby it is difficult to assess its direct impact on fertility (Gulati, 1969; 1978; etc.).

Bhowmik et al. (1971) in their study on the fertility of Zemi women in Nagaland have also observed that women who have got married early have a higher fertility rate than those who have got married late.

3.2(c) Education

Several studies on the relationship between educational status and fertility have suggested that the higher the educational standard, the lower is the fertility rate (UN, 1961; Driver, 1963; NSS, 1967; Mitra, 1966b; Husain, 1970; Kiser, 1971; Kelley, 1976; Cochrane, 1976; and others).

Lotter (1977) has reported that the South African black women with low educational level have a higher fertility rate than those with middle and lower levels of education. Atoh (1985) has observed that a small family has become prevalent in all social and economic strata of the Japanese society. However, in the rural and poor educated populations, the fertility rate is still high, though the differences are not large. Similarly, education has been considered an important factor for the decline of birth rate in most of the western countries (Westoff, 1986).

Husain (1970) has reported that educational status has an inverse relationship with fertility in India. He has also suggested that the parents with higher educational standard are more inclined to limiting their family

size. Dutta and Seal (1974) have confirmed that educational standards of both husband and wife have an inverse relationship with fertility. Jagannadham (1974) has suggested that the promotion of universal literacy and the improvement of girls' educational standard are the key factors in reducing a fertility rate. Agarwala (1972) has also observed that differential fertility by educational level does exist in India; but only when the females are educated up to matriculation or more.

The inverse relationship between mortality and educational level has also been revealed by many studies (Stockwell and Hutchinson, 1975; Knowles and Anker, 1975; Kelley, 1976; Butz and Devanzo, 1978; Bharati, 1981 and others).

Khalifa (1976) and Hull and Hull (1977b) have observed the effect of education on mortality in Indonesia and in rural Egypt. It is reported that the mortality rate tends to decline with the increase in educational standard.

In India, Mandelbaum (1974) has suggested that an educated girl is likely to keep more of her children alive. Similarly, Srivastava and Saksena (1981) have shown that the infant mortality rate is influenced by the mother's educational level. Singh (1974) has also made a similar observation.

Among the Khasi, Baruah and Das (1982) have

observed that the fertility rate decreases with the increase in the level of education of both husband and wife.

3.2(d) Religion

It is generally accepted that religion plays an important role in controlling human fertility (Thompson and Lewis, 1980). It is known that the Muslim have a higher fertility rate than any other religious groups. Kirk (1966) has reported this view by showing that in most parts of the world, fertility among the Muslim is higher than among the non-Muslim.

In India also, some studies have indicated that the Muslim have a higher fertility rate than the Hindu (Davis, 1951; Mukherjee and Singh, 1961; UN, 1961; Rele, 1963; Agarwala, 1964; El-Badry, 1967; Dandekar, 1967; and others).

Srinivasan (1967) has reported that in all age groups, except in ages 25-29 and 35-39 years, the Hindu and the Christian married women have a lower fertility rate than the Muslim married women. The Mysore study (UN, 1961) has also shown that the birth rate among the relatively well educated Christian of Bangalore City, is lower than that in the married women of other religions. This has been clearly shown by the National Sample Survey (NSS) in 1970, that in both rural and urban populations, the Christian have the lowest birth rate, followed by the Sikh, among all religious groups in India. But

it may be mentioned that there are also some studies which do not confirm the provisional supposition that the Muslim have always higher fertility rate than any other religious group. (Nag, 1962; Rao and Mathen, 1970; etc.).

The National Sample Survey (1970) has also shown that mortality, in rural areas, is high among the Hindu and low among the Sikh. But, in urban areas, the death rate is almost similar between the Hindu and the Muslim and also between the Christian and the Sikh.

Chandrasekhar (1972) has pointed out that although the Indian Christian form a small population of the total population, the low infant mortality rate among them is more perceptible than that among the Hindu and the Muslim owing to child care and higher standard of education.

3.2(e) Marriage Pattern

The differences in reproductive behaviour of a population is also considered to be influenced by the differences in mating system and marital migration (Majumdar, 1977; Saheb et al., 1982; Rao and Murty, 1988). It is theoretically believed that the distance between the birth places of spouses is one of the important factors for regulating the spatial distribution of genes in a population (Cavalli-Sforza, 1958, 1962; Boyce et al., 1967; Malhotra and Majumdar, 1974; Malhotra and Kanhere, 1975; Majumdar, 1977; Majumdar and Malhotra, 1979; and

others).

Majumdar and Malhotra (1979), in their study among the 21 endogamous Castes of Dhangar in Maharashtra, have reported that the frequency of intra-village marriages decreases from the southern to the northern areas of Maharashtra. It is found that the coefficient of inbreeding decreases with the rise in mean marital distances. They have also suggested that the mean marital distance is 'more useful in predicting the degree of inbreeding than the population size'.

The role of non-biological factors, such as religion, economic condition, village endogamy, etc. in regulating the pattern of matrimonial distance has been reported by Majumdar (1977). He has suggested that in tribal societies where marriages with neighbouring villages are preferred, the expected distribution of marital distances should be highly leptokurtic and negatively skewed.

Saheb et al. (1982) have also shown that village endogamy among the Kodavas and Amma Kodavas of Karnataka is very low because of some socio-economic factors, such as education, etc. which are responsible for increasing village exogamy in the younger generations.

Rao and Murty (1988) have found that village endogamy is higher in the backward Castes than in the higher ones. This has resulted in the low mean marital distance among the backward Castes than in the forward

Castes. They have also reported that the frequency of consanguineous marriages is higher in lower Castes.

We have made a brief review of the existing literature on demographic studies and it is in no way an exhaustive one. Our purpose is to see the trends in demographic research. In the next chapter, we shall discuss the methods adopted for the collection of demographic materials, such as method of sampling, etc.

CHAPTER III : MATERIALS AND METHODS

In this chapter we shall discuss the materials collected for the present study and the methods that we have applied in it.

3.1. Period and Duration of Field Work.

The field work of the present study was conducted in the five villages falling under the War area during the period from September to November, 1990.

3.2. Sampling Method

Since the War Khasi are distributed in more than 250 villages, we have made a 2% statistical - random sampling of the War villages. In preparing this sampling, first of all, we have made a list of villages falling geographically under the War country. It may be mentioned that some problems were arising at the time when we prepared the list of villages (including hamlets), because we were not ascertained which villages would be included in our sample. Consequently, we have taken the help of the State Government list of villages, falling under the Border Area, along with the assistance of some individual sources in preparing the above mentioned list. The 2% statistical-random sampling of the listed villages were done by a statistician, and eventually, five villages, namely, Kenbah, Mawsiangai, Nongla, Wahummlein and Lapalang were covered under our study. The location of these five villages has been shown in the map (Figure 1).

The total number of households in these five villages is altogether 366; 58 in Kenbah, 41 in Mawsiangai,

Table 1. Distribution of households according to
village and religion

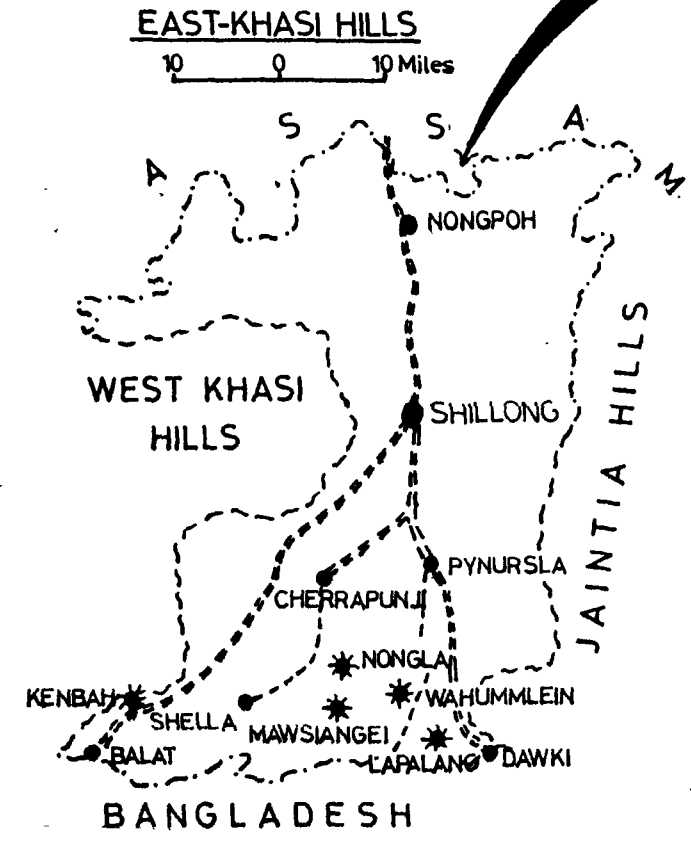
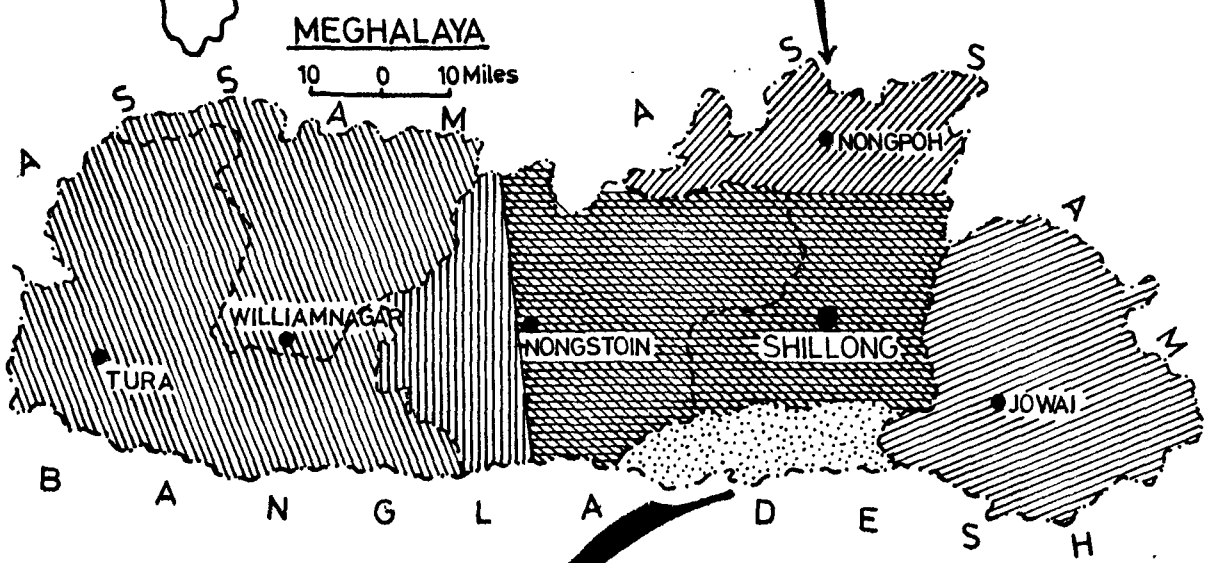
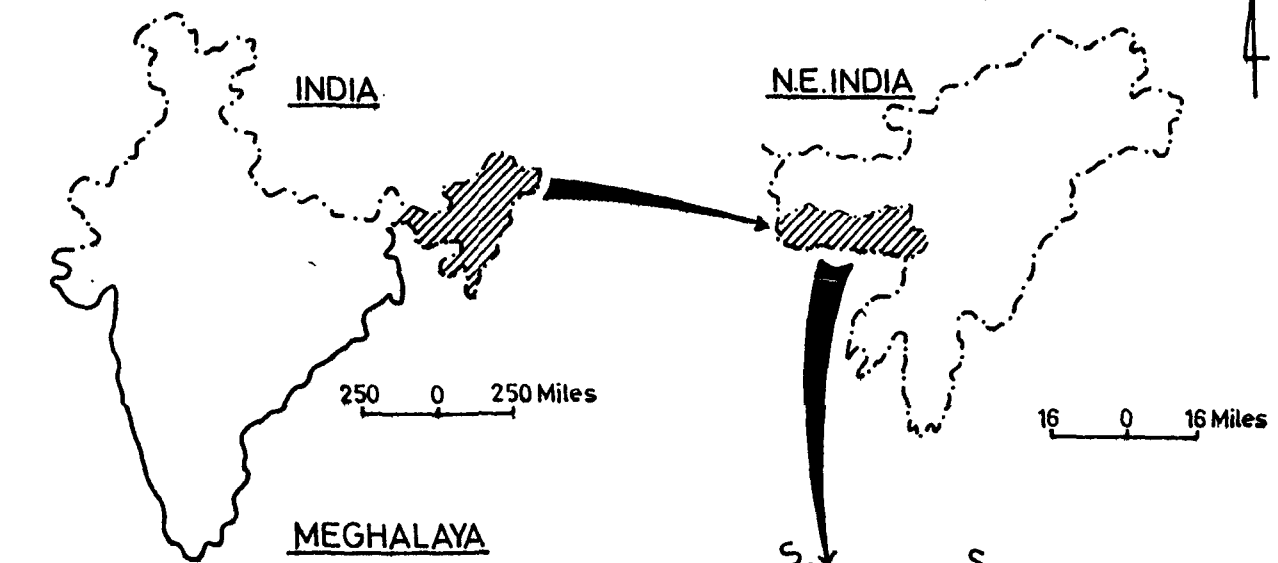
Village	Total No. of households	Christian	Non-Christian
Kenbah	58	50	8
Mawsiangei	41	10	31
Nongla	24	19	5
Wahummlein	33	8	25
Lapalang	210	65	145
Total	366	152	214

Table 1(a) Distribution of Christian households
according to village

Village	Number of Christian households				Total
	Presby- terian	Roman Catholic	Church of God	Fellowship	
Kenbah	47	3	0	0	50
Mawsiangei	6	0	0	4	10
Nongla	11	5	0	3	19
Wahummlein	3	5	0	0	8
Lapalang	34	25	6	0	65
Total	101	38	6	7	152

Fig.1

LOCATION OF THE STUDY AREA



LEGEND

KHYNRIAM	
PNAR	
WAR	
BHOI	
LYNGNGAM	
GARO	

ROAD	
TOWN	
THE VILLAGE WE CONDUCTED THE FIELD STUDY	

24 in Nongla, 33 in Wahummlein and 210 in Lapalang. Table 1 shows that out of 366 households, 152 are Christian and 214 non-Christian households. Table I(a) shows the household distribution of Christian sections in each of the five villages. Out of 152 Christian households, 101, 38, 6 and 7 are the Presbyterian, Roman Catholic, Church of God and Fellowship respectively. It may be noted that there are no other communities, like the Garo, Mizo, Naga, Nepali, Bengalee, etc. who have settled in the above five villages, except those who have come through matrimonial alliances. Thus, data were collected from the Christian and non-Christian War Khasi only. It may also be mentioned that complete enumeration was done in each of those five selected villages.

3.3. Christian and non-Christian Defined

In the present study, the term '**Christian**' has been used to refer to those individuals who are by faith Christian. Christianity includes the Presbyterian, Roman Catholic, Church of God and Fellowship denominations.

Non-Christian, on the other hand, includes those people, who believe in traditional War-Khasi religion (i.e. Seng War Khasi) and those who are believer of Hinduism.

3.4. NATURE OF DEMOGRAPHIC DATA

The nature of demographic data collected, was based on the parameters suggested by the World Health

Organisation (1964 and 1968). These are as follows:

Individual records: include - name of informant; relationship to head of the household; date and place at which record was taken; clan; tribe; religion; community affiliation; total number of family members; age; sex; marital status; place of birth; place of residence; etc.

Fertility includes - pregnancy history of each woman; present age of mother; approximate age at each conception; total number of livebirths; birth order; name, age, sex and marital status of each offspring; etc.

Mortality includes - number of death children; sex; date of birth; age at death; number of reproductive wastages (abortions and stillbirths); etc.

Social correlates: include - monthly and annual income; age at marriage; education; etc.

Marriage pattern: includes - consanguineous relationship between husband and wife prior to marriage; present place of residence; original place of residence; frequency of multiple marriages; function of clan exogamy; etc.

Family Planning: includes - positive and negative attitude towards family planning; availability of family planning advices; sources of advices; nature of contraceptives; duration of use; reason for discontinuation; etc. However, as far as the present study is concerned, no report has been obtained regarding adoption of family planning methods.

3.5. Methods of Data Collection

The entire demographic data were collected through pedigrees and questionnaires from all the 366 households of the five villages. The household schedule/questionnaire - carrying information on age, sex, marital status, tribe, religion, occupation, place of birth, place of residence, etc. was collected from the head of the household or in his/her absence from other elderly member of the household, who is capable of supplying the relevant information. The questionnaire used has been given in Appendix.

The fertility schedule was completed by filling information on number of livebirths, dead children, reproductive wastages, etc. from the married women. Pedigrees were also collected for cross checking the data on fertility. Sometimes, data, given to us by the married women, were cross-checked from their respective husbands.

It may be mentioned that great difficulties were experienced in the assessment of age, particularly of the elderly women, since they were not aware of their real age. Consequently, in these cases, we had to estimate their age with reference to some important local events and to the age of some other individuals, who seemed to be in the same age group. Thus, in this connection, there could be some mistakes in the estimation of age.

3.6. ANALYSES OF DATA : CLASSIFICATION

Mortality: For analysing the data on mortality, three parameters have been taken into consideration. These are: infant mortality (died before one year of life); juvenile (or premature) mortality (deaths before 15 years of age) and reproductive wastages (abortions and stillbirths).

Income Level: In sorting out the income groups, the families having a monthly per capita income of Rs. 300/- or less, were considered to be in the **Low income group**. The families having a monthly per capita income of Rs. 301/- to Rs. 500/- were categorised as the **Middle income group**; and those with monthly per capita income of Rs. 501/- and above, were termed the **High income group**. However, this economic classification is certainly arbitrary. But as far as the present study is concerned, we have used this classification with the main objective to observe how fertility and mortality are influenced by

the rise in income level.

Educational Level: The individuals who are not able to read and write are grouped as **Illiterate**. Those who could read and write and those who have had education upto the standard III, are grouped under **Primary Level**. All other academic, vocational and professional types of education are included in the category of **Above Primary level**. This classification of educational standard is also arbitrary. It may be noted that there were a very few persons, who have had educational standard upto **Above the primary level**. So, this classification has been followed in this report in order to find out the effect of education on fertility and mortality.

Mating pattern: The following points were taken into consideration, while analysing data on mating pattern:

a) Consanguineous relationship between husband and wife before their marriage; pedigrees were drawn showing the exact relationship between the couples.

Marriage distance: For analysing the marital distance, we took into consideration the distance between the birth places of spouses; and the distance between the two places as reported by them were later cross-checked as far as possible. It may also be noted that in determining the distance between the birth places of spouses, we have taken into consideration the shortest walkable

distance (in Kms) and not the actual map distance.

Comparison: We shall compare the present findings with those available on the populations of north-eastern region of this country and also with those on the populations in the rest of India and elsewhere. We shall do all comparisons as far as possible. It may be noted that due to non-availability of all possible literature and inadequate infrastructural facilities in this part of the country, we might have missed some existing literature.

CHAPTER IV. DEMOGRAPHIC CHARACTERISTICS

In the present chapter, we shall deal with the demographic characteristics of the two sections of the War Khasi, viz., the Christian and the Non-Christian.

4.1. Age, Sex and Marital Status

Tables 2(a) and 2(b) show the total population of the Christian and non-Christian War Khasi by age, sex and marital status. It appears that 45.10%, 47.45% and 7.45% of the Christian population and 41.07%, 51.09% and 7.84% of the non-Christian are in the age groups 0 - 14, 15 - 49 and 50 + years respectively. According to Sundberg's classification of population, on the basis of age groups (Datta, 1972), both the Christian and non-Christian sections of the War Khasi seem to be of progressive type.

It is also found that about 90.38% in the Christian and 92.65% in the non-Christian of the unmarried males belong to the age group of 24 years and below, while 96.40% of the unmarried females in the former and 93.67% in the latter are below 24 years of age. Of the married males, 96.20% in the Christian and 91.88%

Table 2(a) Total population of the Christian by age, sex and marital status

Age group (in yrs)	Unmarried		Married		DSW		Total		Persons
	M	F	M	F	M	F	M	F	
0-4	70	80	0	0	0	0	70	80	150
(%)	6.86	7.84	0.00	0.00	0.00	0.00	6.86	7.84	14.71
5-9	80	67	0	0	0	0	80	67	147
(%)	7.84	6.57	0.00	0.00	0.00	0.00	7.84	6.57	14.41
10-14	88	75	0	0	0	0	88	75	163
(%)	8.63	5.65	0.00	0.00	0.00	0.00	8.63	5.65	15.98
0-14	238	222	0	0	0	0	238	222	460
(%)	23.33	21.76	0.00	0.00	0.00	0.00	23.33	21.76	45.10
15-19	56	61	0	3	0	0	56	64	120
(%)	5.49	5.98	0.00	0.29	0.00	0.00	5.49	6.27	11.76
20-24	34	38	6	19	0	0	40	57	97
(%)	3.33	3.72	0.59	1.86	0.00	0.00	3.92	5.59	9.51
25-29	16	9	24	29	2	3	42	41	83
(%)	1.57	0.88	2.35	2.84	0.20	0.29	4.13	4.02	8.14
30-34	5	1	15	21	2	2	22	24	46
(%)	0.49	0.10	1.47	2.06	0.20	0.20	2.16	2.35	4.51
35-39	1	0	16	22	2	0	39	22	61
(%)	0.10	0.00	1.53	2.16	0.20	0.00	3.82	2.16	5.98
40-44	2	1	19	11	0	2	21	16	37
(%)	0.20	0.10	1.86	1.27	0.00	0.20	2.06	1.57	3.63
45-49	1	0	19	19	0	1	20	20	40
(%)	0.10	0.00	1.86	1.86	0.00	0.10	1.96	1.96	3.92
15-49	115	110	119	126	6	8	240	244	484
(%)	11.27	10.78	11.67	12.35	0.59	0.78	23.53	23.92	47.45
50-54	0	0	6	10	1	7	7	17	24
(%)	0.00	0.00	0.59	0.98	0.10	0.69	0.69	1.67	2.35
55-59	0	0	5	5	2	5	7	10	17
(%)	0.00	0.00	0.49	0.49	0.20	0.49	0.69	0.98	1.67
60 +	1	1	10	7	9	7	20	15	35
(%)	0.10	0.10	0.98	0.69	0.88	0.69	1.96	1.47	3.43
50 +	1	1	21	22	12	19	34	42	76
(%)	0.10	0.10	2.06	2.16	1.18	1.86	3.33	4.12	7.45
Total	354	333	140	148	18	27	512	508	1020
(%)	34.71	32.65	13.73	14.51	1.76	2.65	50.20	49.80	100

M = Male; F = Female.

Sex ratio : 100.79 males per 100 females.
 In 0-14 yrs: 107.21 males per 100 females.
 15-49 " : 98.36 males per 100 females.
 50+ " : 80.95 males per 100 females.

Table 2(b) Total population of the non-Christian by age, sex and marital status

Age group (in yrs)	Unmarried		Married		DSW		Total		Person
	M	F	M	F	M	F	M	F	
0-4	104	91	0	0	0	0	104	91	195
(%)	7.54	6.86	0.00	0.00	0.00	0.00	7.84	6.86	14.69
5-9	77	72	0	0	0	0	97	72	169
(%)	7.31	5.43	0.00	0.00	0.00	0.00	7.31	5.43	12.74
10-14	94	84	3	0	0	0	97	84	181
(%)	7.08	6.33	0.23	0.00	0.00	0.00	7.31	6.33	13.64
0-14	295	247	3	0	0	0	298	247	545
(%)	22.23	18.61	0.27	0.00	0.00	0.00	22.46	18.61	41.07
15-19	81	64	1	2	1	0	83	66	149
(%)	6.10	4.82	0.08	0.15	0.08	0.00	6.25	4.97	11.23
20-24	56	44	11	24	0	0	67	68	135
(%)	4.22	3.32	0.83	1.81	0.00	0.00	5.05	5.12	10.17
25-29	31	20	43	38	4	1	78	59	137
(%)	2.34	1.51	3.24	2.86	0.30	0.08	5.88	4.45	10.32
30-34	7	2	32	31	10	3	49	36	85
(%)	0.53	0.15	2.41	2.34	0.75	0.23	3.69	2.71	6.41
35-39	4	0	33	26	5	6	42	32	74
(%)	0.30	0.00	2.49	1.96	0.38	0.45	3.17	2.41	5.58
40-44	1	0	15	18	2	4	18	22	40
(%)	0.08	0.00	1.13	1.36	0.15	0.30	1.36	1.66	3.01
45-49	1	2	21	27	5	2	27	31	58
(%)	0.08	0.15	1.58	2.03	0.38	0.15	2.03	2.34	4.37
15-59	181	132	156	166	27	16	364	314	678
(%)	13.64	9.95	11.76	12.51	2.03	1.21	27.43	23.66	51.09
50-54	1	0	14	13	1	6	16	19	35
(%)	0.08	0.00	1.06	0.98	0.08	0.45	1.21	1.43	2.64
55-59	0	0	6	6	2	1	8	7	15
(%)	0.00	0.00	0.45	0.45	0.15	0.08	0.60	0.53	1.13
60 +	1	0	17	16	8	12	26	28	54
(%)	0.08	0.00	1.28	1.21	0.60	0.90	1.96	2.11	4.07
50-60	2	0	37	35	11	19	50	54	104
(%)	0.15	0.00	2.79	2.64	0.83	1.43	3.77	4.07	7.84
Grand Total	478	379	196	201	38	35	712	615	1327
(%)	36.02	28.56	14.77	15.15	2.86	2.64	53.65	46.35	100

M= Male, F= Female.

Sex ratio : 115.77 males per 100 females.

In: 0-14 years = 120.65 males per 100 females.

15-49 " = 115.92 males per 100 females.

50 + " = 92.59 males per 100 females.

in the non-Christian are aged 25 years and above. Similarly, about 87.43% of the married women in the Christian and 88.98% in the non-Christian are aged 25 years and above. It is further seen that 12.57% of the married women in the Christian and 11.02% in the non-Christian are married before 25 years of age. Among the married males, on the other hand, 3.80% in the Christian and 6.84% in the non-Christian are married before 25 years of age. Thus it shows that marriage is more delayed in case of males than in case of females in both the sections.

4.2. Sex Ratio

The overall sex ratio, i.e., number of males per 100 females is 100.79 among the Christian and 115.77 among the non-Christian. Thus, it appears that the overall sex ratio in the Christian section of the War Khasi is very near to the ideal sex ratio of 1:1, whereas in the non-Christian section, the sex ratio is quite high, which is statistically significant (χ^2

= 7.0904, $df = 1$, $P < 0.01$). In the age group 0-14 years, the sex ratio among the Christian is 107.21 and it is 120.65 in the non-Christian.

It indicates that the sex ratio in both the sections of the population, in this age group, is high, though it is considerably higher among the non-Christian. The χ^2 values show that it is statistically significant in the non-Christian ($\chi^2 = 4.7724$, $df = 1$, $P < 0.05$) but not so in case of the Christian ($\chi^2 = 0.5566$, $df = 1$, $P > 0.05$). It is well known that the secondary sex ratio is always high (Crew, 1937; Stern, 1960). The point to be noted is that the high sex ratio is still persisting through the age group 0-14 years in case of both the sections of the population.

In the age group 15-49 years, the sex ratio is 98.36 in the Christian and 111.92 in the non-Christian. The sex ratio seems to have been lower among the Christian which indicates greater male mortality. But it still stays high among the non-Christian, though it is not statistically significant at 5% level ($\chi^2 = 3.6874$, $df = 1$, $P > 0.05$). In the last age group, i.e., 50 years and above, the sex ratio is 80.95 in the Christian and 92.59 in the non-Christian. It appears that the sex ratio is low in both the sections in this age group. It indicates that in the tertiary age group, i.e., 50 + years, male mortality is greater than female mortality and it holds good

for both the sections.

The population pyramid (Fig. 2) depicts that the base is quite broad in both the Christian and non-Christian sections of the population, which indicates a fairly high rate of fertility in both the sections.

Table 3. Multiple marriages by age group of spouses.

Age groups (in years)	Individual married										% of more than one married	
	Once		Twice		3 times		4 times		Total			
	M	F	M	F	M	F	M	F	M	F	M	F
<u>Christian</u>												
≤24	6	22	0	0	0	0	0	0	6	22	0	0
25 - 48	93	89	5	3	2	0	0	0	100	92	7.00	3.26
49 +	42	56	7	3	1	2	2	0	52	61	19.23	8.20
Total (M+F)	308		18		5		2		333		7.51	
%	92.49		5.41		1.50		0.60		100.00			
<u>Non-Christian</u>												
≤24	16	26	0	0	0	0	0	0	16	26	0	0
25 - 48	106	100	29	24	7	3	2	0	144	127	26.39	21.26
49 +	43	55	18	21	9	5	4	2	74	83	41.89	33.73
Total (M+F)	346		92		24		8		470		26.38	
%	73.62		19.57		5.11		1.70		100.00			

M- Male, F- Female.

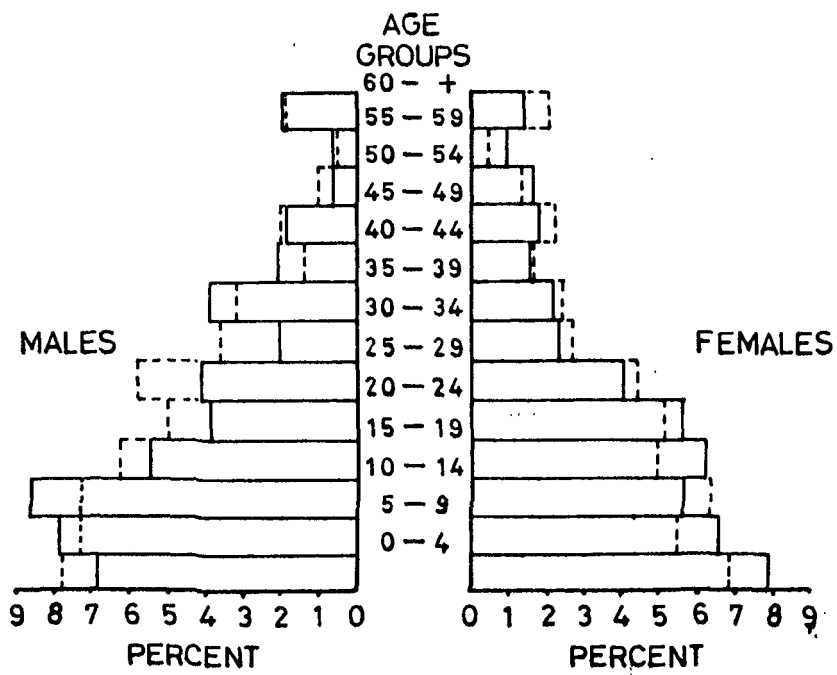


FIG.2 POPULATION PYRAMID

4.3. Multiple Marriages

Table 3 shows that about 7.51% and 26.38% of the individuals in the Christian and the non-Christian respectively, have changed their mates at least once. It is seen that in both the sections, males and females do not change their partners so long as they are below 24 years of age. The frequency of marrying more than one time tends to increase with the rise in age of the individuals. In the age groups 25-48 and 49 + years, it is found that 7% and 19.23% of the married males among the Christian and 26.39% and 41.89% of married males among the non-Christian have changed their mates at least once. In the age groups 25-48 and 49 + years, 3.26% and 8.20% of the Christian married females, and 21.26% and 33.37% of the non-Christian females respectively, have married more than one time. Thus, it indicates that the men change their mates more frequently than the women in both the sections of the population.

4.4. Age at Marriage and First Child Birth

Table 4 shows that the mean age at first marriage is 23.65 ± 0.30 years in male and 20.04 ± 0.23 years in female among the Christian section. But among the non-Christian, it is 22.87 ± 0.21 years in male and 19.44 ± 0.25 years in female. So it appears that the mean age at marriage is higher for both male and female in the Christian section than in the non-Christian section of the War Khasi.

Table 4. Mean age at marriage

Section of population	Number of Parents		Mean \pm S.E.	
	Male	Female	Male	Female
Christian	158	175	23.65 \pm 0.30	20.04 \pm 0.32
Non-Christian	234	236	22.87 \pm 0.21	19.44 \pm 0.25

Table 5. Mean age at first child birth

Section of Population	Number of Parents		Mean \pm S.E.	
	Male	Female	Male	Female
Christian	158	175	25.04 \pm 0.39	22.31 \pm 0.32
Non-Christian	234	236	24.99 \pm 0.13	21.96 \pm 0.25

Table 5 indicates the mean age at first child birth. It is found that the mean age at first child birth among the Christian is 25.04 \pm 0.39 years for male and 22.31 \pm 0.32 for female. Among the non-Christian, it is 24.99 \pm 0.13 and 21.96 \pm 0.25 years for male and female respectively. It shows that as far as the mean age at first child birth is concerned, there is not much difference between the Christian and the non-Christian section. This holds good for both sexes. It is indeed difficult to classify any human population according to generation, since it is always overlapping in any human population into some arbitrary generations. Following the method suggested by Glass (1956), we have taken into considera-

tion the mean age at first child birth of all married individuals. Since there is not much difference in mean age at first child birth between the Christian and the non-Christian section of the population, we have pooled all the individuals (who are having children) together, and the mean age at first child birth is found to be 23.58 years. So we have taken 24 years as an arbitrary length of a generation for both the sections.

4.5. Infertility

Table 6 shows that about 5.71% and 8.05% of all married women, in the Christian and the non-Christian respectively, have never conceived. Among the Christian, about 70% of the never pregnant women are below 30 years of age, and 30% of them belong to the age group 30-34 years. This indicates that 10.53%, 15.63% and 13.04% of all the Christian married women in the age groups 20-24, 25-29 and 30-34 years respectively, have never conceived. In the non-Christian section, on the other hand, it is found that 63.16% of the never pregnant women are aged below 30 years and 36.84% are aged above 30 years. It further shows that 50%, 16.67%, 17.95%, 5.88%, 6.25%, 4.55% and 2.41% of the married women in the non-Christian section belong to the age groups 15-19, 20-24, 25-29, 30-34, 35-39, 40-44 and 45 + years respectively.

Table 6. Ever-Pregnant and Never-Pregnant women by age groups.

Pregnancy status	Age group of married women							Total
	15-19	20-24	25-29	30-34	35-39	40-44	45+	
<u>Christian</u>								
Never Pregnant	0	2	5	3	0	0	0	10
Ever Pregnant	3	17	27	20	22	15	61	165
Total	3	19	32	23	22	15	61	175
% of never pregnant	0	10.53	15.63	13.04	0	0	0	5.71
<u>Non-Christian</u>								
Never Pregnant	1	4	7	2	2	1	2	19
Ever Pregnant	1	20	32	32	30	21	81	217
Total	2	24	39	34	32	22	83	236
% of never pregnant	50.00	16.67	17.95	5.88	6.25	4.55	2.41	8.05

4.6. Fertility

Table 7 shows the completed family size among the Christian and non-Christian women of the War Khasi. For calculation of completed family size, we have taken into consideration only those women who are aged 45 years and above, married once and live continuously in wedlock till attainment of 45 years of age. It is seen that the completed family size is slightly higher in the Christian (6.69 ± 0.39) than in the non-Christian (6.61 ± 0.35). This

difference is, however, not statistically significant at 5% level of probability ($t = 0.1509$). Table 7 further shows the mean number of surviving children to such women is 5.73 ± 0.36 among the Christian and 5.47 ± 0.28 among the non-Christian. This difference between them is also not statistically significant at 5% level of probability ($t = 0.5778$).

Table 7. Completed family size.

Section of population	No. of mothers (45+ years)	Live-births		Mean No. of live-births per mother (\pm S.E.).	Mean No. of surviving offspring per mother (\pm S.E.).
		No. of living	No. of deaths		
Christian	52	298	50	6.69 ± 0.39	5.73 ± 0.36
Non-Christian	72	394	82	6.61 ± 0.35	5.47 ± 0.28

$t=0.1509, P>0.05$ | $t=0.5778, P>0.05$

It is seen that the mean number of livebirths per woman, living in wedlock, increases with the rise in age groups, in both Christian and non-Christian sections of the population (Table 8). The mean numbers of livebirths per mother are 1.45 ± 0.19 , 2.93 ± 0.63 , 4.71 ± 0.45 , 6.55 ± 0.49 and 6.17 ± 0.50 among the Christian, and 1.92 ± 0.30 , 2.66 ± 0.27 , 4.91 ± 0.41 , 5.37 ± 0.43 and 6.47 ± 0.62 among the non-Christian, in the age groups below 24, 25-29, 30-34, 35-39, and 40-44 years respectively. The difference in mean number of livebirths between these two sections in respect of each of the age groups is not statistically significant at 5% level of probability.

Table 8 Live-births by age groups of women living
continuously in wedlock

Age groups (years)	Number of live-births												No of mo- thers	Mean ± S.E.
	0	1	2	3	4	5	6	7	8	9	10	11		
<u>Christian</u>														
≤ 24	2	11	7	1	1	0	0	0	0	0	0	0	22	1.45±0.19
25 - 29	4	4	4	8	3	4	1	0	0	0	1	0	29	2.93±0.63
30 - 34	2	0	2	0	2	7	4	4	0	0	0	0	21	4.71±0.45
35 - 39	0	0	2	1	1	3	2	4	5	2	2		22	6.55±0.49
40 - 44	0	0	0	1	1	2	3	3	0	2			12	6.17±0.50
Total	8	15	15	11	8	16	10	11	5	4	3	0	106	4.08±0.26
<u>Non-Christian</u>														
≤ 24	4	8	6	5	2	0	0	1					26	1.92±0.30
25 - 29	3	5	9	10	3	3	1	1					35	2.66±0.27
30 - 34	0	1	1	4	4	5	2	4	1	1			23	4.91±0.41
35 - 39	1	1	0	3	4	6	4	1	5	2			27	5.37±0.43
40 - 44	0	1	0	1	2	1	3	4	2	1	0	2	17	6.47±0.62
Total	8	16	16	23	15	15	10	11	8	4	0	2	128	3.99±0.23

Between Christian and non-Christian *

24 year or below, t = 1.24

25 - 29 years, t = 0.48

30 - 34 years, t = 0.62

35 - 39 years, t = 0.76

40 - 44 years, t = 0.87

Total t = 0.10

*None of the t-values is significant at 5% level.

The fertility ratio (i.e. the number of children aged 4 years and below per 100 women aged between 15 and 49 years, irrespective of marital status) is found to be 61.48 in the Christian and 62.10 in the non-Christian (Table 9). It suggests that the fertility rate, as indicated in the child woman ratio in both the sections of the population is moderate.

Table 9. Child woman ratio (Fertility ratio).

Section of population	No. of women aged 15 - 49 years	No. of children below 5 years	Fertility ratio (per 100 women)
Christian	244	150	61.48
Non-Christian	314	195	62.10

Table 10. Number of live-births and surviving children to all married women by age groups

Age groups (in years)	No. of married women		No. of live-births		No. of surviving children		Mean No. of births \pm S.E.		Mean No. of surviving children \pm S.E.	
	CH	NCH	CH	NCH	CH	NCH	CH	NCH	CH	NCH
15-19	3	2	4	1	4	1	1.33 \pm 0.28	0.50 \pm 0.35	1.33 \pm 0.28	0.50 \pm 0.35
20-24	19	24	28	49	28	46	1.47 \pm 0.22	2.04 \pm 0.17	1.47 \pm 0.22	1.92 \pm 0.26
25-29	32	39	92	93	88	90	2.88 \pm 0.57	2.38 \pm 0.28	2.75 \pm 0.35	2.31 \pm 0.26
30-34	23	34	99	146	87	135	4.30 \pm 0.46	4.29 \pm 0.36	3.78 \pm 0.44	3.97 \pm 0.38
35-39	22	32	144	163	132	145	6.55 \pm 0.49	5.09 \pm 0.28	6.00 \pm 0.46	4.53 \pm 0.43
40-44	15	22	84	132	77	119	5.60 \pm 0.63	6.00 \pm 0.62	5.13 \pm 0.58	5.41 \pm 0.39
45 +	61	83	391	516	337	430	6.41 \pm 0.35	6.22 \pm 0.33	5.52 \pm 0.32	5.18 \pm 0.27
Total	175	236	842	1100	757	966	4.81 \pm 0.24	4.66 \pm 0.18	4.30 \pm 0.20	4.09 \pm 0.29

*CH = Christian; NCH Non-Christian.

Table 10 shows the number of livebirths and surviving children of all married women by age groups. It is found that the mean number of livebirths per mother is 4.81 ± 0.24 in the Christian and 4.66 ± 0.18 in the non-Christian, and the mean number of surviving children per mother is 4.30 ± 0.20 and 4.09 ± 0.29 in the Christian and the non-Christian respectively. It is further seen that the mean number of livebirths in both the sections of the population increases as age advances. In the Christian, the mean number of livebirths increases from 1.33 ± 0.28 for the women in the age group 15-19 years to 6.41 ± 0.35 for the women aged 45 years and above. Among the non-Christian, it increases from 0.50 ± 0.35 for those women in the age group 15-19 years to 6.22 ± 0.33 for the women aged 45 years and above.

The mean number of surviving children per married woman varies from 1.33 ± 0.28 in the age group 15-19 years to 5.52 ± 0.32 in the age group 45 years and above among the Christian section; whereas among the non-Christian section, the mean number of surviving children per married woman varies between 0.50 ± 0.35 in the age group 15-19 years, and 5.18 ± 0.27 in the age group 45 + years. So, it shows that the mean number of livebirths and the mean number of surviving children for almost all the age groups are greater in the Christian than in the non-Christian.

Table 11. Surviving sibship size among the married women aged 15-49 years.

Section of population	Number of surviving children												No. of mothers	Mean \pm S.E.	
	0	1	2	3	4	5	6	7	8	9	10	11			12
Christian	12	17	16	16	17	16	16	11	6	3	2	1	1	134	4.00 \pm 0.23
Non-Christian	19	18	26	30	26	19	15	11	10	5	1	2	0	182	3.75 \pm 0.19

$$t = 0.3205, \quad P > 0.05$$

Taking all the married women together during their active reproductive period, i.e. 15-49 years, it is seen that the mean number of surviving children per married woman is 4.00 \pm 0.23 and 3.75 \pm 0.19 in the Christian and non-Christian sections of the population respectively (Table 11). The difference between them is not statistically significant at 5% level ($t = 0.3205$). It is also found that 8.96% of the Christian women and 10.44% of the non-Christian women have no surviving child. It is, however, quite possible that many of them are still in early part of the reproductive period and may still have chance to contribute.

4.7. Mortality

The frequencies of infant and juvenile mortality have been given in Table 12. Out of 842 livebirths to the Christian mothers of all ages, 58 individuals or 6.89% and out of 1100 livebirths to the non-Christian mothers, 94 individuals or 8.55% have died before the age of one year. The juvenile mortality rate is found to be 3.68% in the Christian and 3.64% in the non-Christian. The binomial test for equality of proportions (Table 12a) shows that in respect of infant and juvenile mortality rates, there are no statistical differences between the Christian and the non-Christian (Infant mortality = 0.0166 ± 0.0123 and juvenile mortality = 0.0088 ± 0.0090).

For the mothers aged 45 years and above, the infant mortality rate is 8.70% in the Christian and 11.82% in the non-Christian. The juvenile mortality rate is 5.12% among the Christian and 4.84% among the non-Christian. The difference between the two sections is not significant in case of infant mortality; but it is significant in case of juvenile mortality (Table 12a).

Table 12. Infant Mortality and Mortality before 15 Years

Section of Population	Mothers of all ages						Mothers aged 45 + years					
	No. of mothers	No. of live births	Mortality				Mortality					
			Before 1 year	%	Before 15 yrs.	%	No. of mothers	No. of lbs.	Before 1 yr.	%	Before 15 yrs.	%
Christian	175	842	58	6.89	31	3.68	61	391	34	8.70	20	5.12
Non-Christian	236	1100	94	8.55	40	3.64	83	516	61	11.82	25	4.84

Table 12(a), Binomial test for equality of proportions.

Mothers of all ages	Mothers aged 45 years and above.
Infant mortality: 0.0166 ± 0.0123 , Insignificant	Infant mortality: 0.0313 ± 0.0205 Insignificant
Juvenile mortality: 0.0088 ± 0.0090 , Insignificant	Juvenile mortality: 0.0512 ± 0.0146 , Significant

Table 13. Reproductive Wastage

Item	Christian	Non-Christian
Total No. of mothers	175	236
Total number of pregnancies	899	1186
Total number of abortions	41	55
Total number of still births	28	41
Total number of reproductive wastages	69	96
Abortion (%)	4.56	4.64
Still-birth (%)	3.11	3.46
Reproductive wastages (abortions & stillbirths)-(%)	7.68	8.09

4.8. Reproductive Wastage

Table 13 shows the reproductive wastages experienced by all ever married women. It is found that the frequencies of abortion in relation to the total pregnancies are 4.56% and 4.64% in the Christian and the non-Christian respectively. The frequencies of stillbirths in relation to the total pregnancies are 3.11% and 3.46% in the Christian and non-Christian respectively. The average number of reproductive wastages (abortions and stillbirths) per mother is 0.39 in the Christian and 0.41 in the non-Christian. The prenatal death rates (i.e. reproductive wastages) are 7.68% and 8.09% in the Christian and the non-Christian respectively.

Table 14. Number of twins by age group
of ever married women

Age groups (in years)	No. of married women		No. of pregnancies		No. of twins						twin rate (%)	
	CH*	NCH*	CH*	NCH*	Christian			Non-Christian			CH*	NCH*
					CC**	NCC**	Total	CC**	NCC**	Total		
≤24	22	26	35	50	1	0	1	0	0	0	4.54	0
25-29	32	39	93	99	0	1	1	2	1	3	3.12	3.03
30-34	23	34	98	160	2	0	2	0	0	0	8.69	0.00
35-39	22	32	157	180	2	3	5	2	0	2	9.09	1.11
40-44	15	22	95	143	1	0	1	2	1	3	20.00	2.10
45-49	20	29	147	205	0	0	0	1	0	1	0.00	0.49
50 +	41	54	274	349	2	0	2	1	0	1	2.44	0.29
Total	175	236	899	1186	8	4	12	8	2	10	1.33	0.84

Christian: Concordant twin - 66.67%

Non-concordant twin - 33.33%

Non-Christian: Concordant " - 80%

Non-concordant " - 20%

*CH - Christian

NCH - Non-Christian

**CC - Concordant (like sexed), NCC - Non-concordant (unlike sexed).

4.9. Multiple births

Table 14 shows the frequency of twin births in the Christian and the non-Christian section of the

War Khasi. It indicates that the overall rate of twin births in the Christian (1.33%) is higher than that in the non-Christian (0.84%). In both the sections, it is found that the twinning frequency is increasing when the mother is 30 years of age and above. The table further shows that the frequencies of concordant and non-concordant twin in the Christian are 66.67% and 33.33% respectively, and in the non-Christian they are 80% and 20% respectively. Thus, according to Weinberg's method, cited by Mckusick (1972), the expected ratio between concordant (MZ) and non-concordant (DZ) is 1:1 among the Christian and 3:1 among the non-Christian.

CHAPTER V. SOCIAL CORRELATES

In this chapter we shall examine the effects of some social correlates on demographic parameters.

5.1. Age at Marriage

Table 15 shows the average number of livebirths per ever married woman by age at marriage. The table indicates that the average number of livebirths decreases with the increase in age at marriage in both the sections. So, it may be inferred that the fertility rate varies inversely with the age at marriage, i.e., lower the age at marriage, higher is the fertility rate.

Table 15. Number of livebirths by age at marriage

Age at marriage (in years)	No. of Women		No. of live- births		Average No. of livebirths.	
	Christian	Non- Christian	Chris- tian	Non-Chris- tion	Chris- tian	Non- Christian
10-14	3	9	20	49	6.67	5.44
15-19	8	131	473	622	5.63	4.74
20-24	60	72	244	339	4.06	4.71
25-29	22	20	85	72	3.86	3.60
30-34	6	4	20	18	3.33	4.50

Table 16. Live-births and mortality rate
by economic condition

Income level	No. of mothers	No. of live-births	No. of deaths		Average No. of live-births per mothers	Mortality rate (%)	
			1 year	15years		1year	15 years
<u>Christian</u>							
Low	96	524	37	14	5.46	6.87	3.24
Middle	59	254	17	8	4.31	6.69	3.14
High	20	64	4	2	3.20	6.25	3.12
<u>Non-Christian</u>							
Low	113	679	66	29	6.00	9.72	4.27
Middle	97	349	23	8	3.60	6.59	2.29
High	26	72	5	3	2.77	6.94	4.17

5.2. Economic Condition

Table 16 indicates the relationship between economic condition and fertility as well as mortality. Among the Christian, the average number of livebirths per mother is 5.46, 4.31 and 3.20 in the low, middle and high income groups respectively; and among the non-Christian, it is 6.00, 3.60 and 2.77 in low, middle and high income groups respectively. Thus it appears that the ave-

rage number of livebirths per mother decreases with the rise in income level, and it is true for both the sections of the population. The table further shows that the infant mortality (death before one year of age) and juvenile mortality (death before 15 years of age) rates have also declined gradually with the rise in the level of per capita income among the Christian. But this trend is, however, not very clear in case of the non-Christian among which it is seen that the high income groups experiences higher infant and juvenile mortality rates than the middle income group, though it is certainly lower than the low income group.

Table 17. Fertility and mortality by educational level

Educational level	No. of mothers	%	No. of live-births	No. of deaths		Average No. of live-births	Mortality rate (%)	
				1 year	15 years		1 year	15 years
<u>Christian</u>								
<u>Illiterate</u>	100	57.14	533	47	27	5.33	8.82	5.07
Primary	48	27.43	195	7	3	4.06	3.59	1.54
Above Primary	27	15.43	114	4	1	4.22	3.51	0.88
<u>Non-Christian</u>								
<u>Illiterate</u>	121	51.27	741	69	28	6.12	9.31	3.78
Primary	93	39.41	257	21	11	2.76	8.17	4.28
Above Primary	22	9.32	102	4	1	4.64	3.92	0.98

5.3 Education

Table 17 shows the relationship between fertility and educational level of the married women. The average number of livebirths per mother is found to be 5.33, 4.06 and 4.22 in the Christian, and 6.12, 2.76 and 4.64 in the non-Christian, in the illiterate, primary and above primary groups respectively. Thus, it appears that fertility is also influenced by the educational standard of the mother.

The relationship between mortality (infant and juvenile) and educational level of the married women is also given in Table 17. Both the infant and juvenile mortality rates have decreased gradually with the rise in educational standard of the mothers. The infant mortality rates are 8.82%, 3.59% and 3.51% in the Christian, and 9.31%, 8.17% and 3.92% in the non-Christian, in illiterate, primary and above primary levels of education respectively. The juvenile mortality rates, on the other hand, are 5.07%, 1.54% and 0.88 among the Christian, and 3.78%, 4.28% and 0.98% among the non-Christian in the illiterate, primary, and above primary levels respectively. Thus, it indicates that education has an inverse effect on both fertility and mortality rates.

The trend is quite clear in case of the Christian. But it is certainly perceptible, though not very clearly, in case of the non-Christian. It can, however, be said that the fertility rate as well as the mortality rate (both infant and juvenile) will fall considerably in the case of those mothers, irrespective of religion, who have educational standard upto **primary and above primary** levels.

5.4. Family Planning

In the present study, no couple, in either of the two sections has been found to have adopted at any point of time any of the birth control methods. Why they have not adopted, is altogether a different kind of problem to probe in, and it is beyond the scope of the present study. But it may be taken as granted that the reproductive performances of the married women, recorded in the present study, were by and large in a natural condition.

5.5. Religion

It has been observed from the general demographic data presented earlier (chapter IV) that religion has some effect on fertility and mortality. It may be noted that the entire demographic data in the present study have been analysed on the basis of religious affiliation. To understand the effect of religion on various demographic parameters, the following points may be recapitulated. It may also be mentioned that both the religious groups live in similar ecological setting.

a) It is found that the mean number of livebirths per married women (Table 8) is apparently higher among the Christian than among the non-Christian. But there is no statistically significant difference in fertility rate between the Christian and the non-Christian.

b) In case of child woman ratio (i.e. fertility ratio), the non-Christian have slightly higher value than the Christian (Table 9).

c) In case of completed family size, the Christian have higher mean number of livebirths and surviving children per mother than the non-Christian (Table 7).

d) In case of both infant and juvenile mortality rates, though the non-Christian have a higher infant mortality rate but lower juvenile mortality rate than the Christian, yet the differences are found to be significant by the binomial test for equality of proportions (Table 12 and 12a).

e) When the mothers aged 45 years and above have been taken into consideration, it is found (Table 12 and 12a) that the infant mortality rate is higher in the non-Christian than in the Christian. But in case of juvenile mortality rate, the situation is just reverse. The difference between the Christian and the non-Christian in case of the juvenile mortality rate is found to be statistically significant by the binomial test for equality of proportions.

f) So far as the age at marriage is concerned, it is seen that the non-Christian marry earlier than the Christian (Table 5).

g) It is generally expected with the advent of Christianity that the people will become more and more educated, since the Christian Missionaries have had particular interest in spreading education. But in case of the War Khasi, it is found that the frequency of illiteracy among the women is more in the Christian than in the non-Christian (Table 17). It is not in conformity with the general expectation.

So, it seem that so far as the present study is concerned, religion has played some role, but certainly is not a very strong social correlate in determining the various demographic parameters, like fertility, mortality, etc.

5.6. Clan

In Christian religion, there is as such no concept of clan. Among the War Khasi, it is seen that both the Christian and non-Christian sections have been following the rule of clan exogamy. In either of the sections, not a single case has been found where there is any departure from the rule of clan exogamy. Thus, it shows that the Christian section of the War Khasi has still been following the traditional rule of clan exogamy. So, it seems that tradition dies very hard, even after conversion of the people into Christianity for nearly one hundred and fifty years (Dasgupta, 1984).

CHAPTER VI. GENETIC IMPLICATIONS

In the present chapter we shall try to discuss the genetic implications of the demographic findings that we have already dealt with in the previous chapters.

6.1. Endogamy by Religion

Table 18 shows to what extent endogamy by religion is maintained in both the sections of the population. It is found that out of 192 marriages among the Christian section, there are 7 (i.e. 3.65%) cases where marriage has taken place with the non-Christian. In case of the non-Christian, 23 (i.e. 7.30%) out of 315 marriages have taken place with the Christian. If we take into consideration the frequency of marriages with different religious communities, it is found that between the two sections, i.e., the Christian and the non-Christian, the difference is not statistically significant ($\chi^2 = 2.8618$, $df = 1$, $P > 0.05$). It shows that religious endogamy is constantly being maintained by each of the two sections of the War Khasi.

Table 18. Marriage by religion

Section of population	within the religion	outside the religion*	Total
Christian	185	7	192
%	96.35	3.65	100
Non-Christian	292	23	315
%	92.70	7.30	100

$$\chi^2 = 2.8618, df = 1, P > 0.05$$

*Husband from another religion

The present findings strongly indicate that there is an absolute tendency of procuring mates from one's own village. It holds good for both the Christian and non-Christian sections of the population. So, it shows that there is a strong tendency for village endogamy among the War Khasi - irrespective of religion. With such a tendency for village endogamy, there is a high probability that in course of time each of these villages in each of the two sections of the War Khasi, may eventually emerge as a separate genetic isolate and thereby will lose its genetic homogeneity within each of the section, and such micro-heterogeneity may lead to a further genetic differentiation between villages within each section of the War Khasi.

Table 20. Marriage distance by income levels

Income level	Marital distance (Km)										Total	Mean \pm S.E.
	0	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41 +		
1	2	3	4	5	6	7	8	9	10	11	12	13
<u>Christian</u>												
Low	103	1	1	0	1	0	0	0	0	0	106	0.33 \pm 0.46
%	97.17	0.94	0.94	0	0.94	0	0	0	0	0	100	
Middle	54	0	1	0	0	1	1	1	2	3	63	4.76 \pm 1.55
%	87.51	0	1.59	0	0	1.59	1.59	1.59	3.17	4.76	100	
High	20	0	0	0	0	1	0	0	0	2	23	4.65 \pm 2.57
%	86.96	0	0	0	0	4.35	0	0	0	8.70	100	
Total	177	1	2	0	1	2	1	1	2	5	192	2.30 \pm 0.63
%	92.12	0.52	1.04	0	0.52	1.04	0.52	0.52	1.04	2.60	100	

cond/-

	1	2	3	4	5	6	7	8	9	10	11	12	13
<u>Non-Christian</u>													
<u>Low</u>	148	2	1	1	1	0	0	1	1	1	157	1.25	±0.48
%	94.27	1.27	0.64	0.64	0.64	0	0	0.64	0.64	0.64	100		
<u>Middle</u>	113	1	0	0	2	1	0	0	0	1	118	0.94	±0.47
%	95.76	0.85	0	0	1.69	0.85	0	0	0	0.85	100		
<u>High</u>	36	2	0	0	0	0	1	0	0	2	40	3.05	±1.57
%	90.00	5.00	0	0	0	0	2.50	0	0	5.00	100		
<u>Total</u>	297	5	1	1	3	1	1	1	1	4	315	1.28	±0.35
%	94.29	1.59	0.32	0.32	0.95	0.32	0.32	0.32	0.32	1.27	100		

t - test:

Low income - t = 1.5018, P > 0.05

Middle income - t = 2.9424, P < 0.05

High income - t = 0.5548, P > 0.05

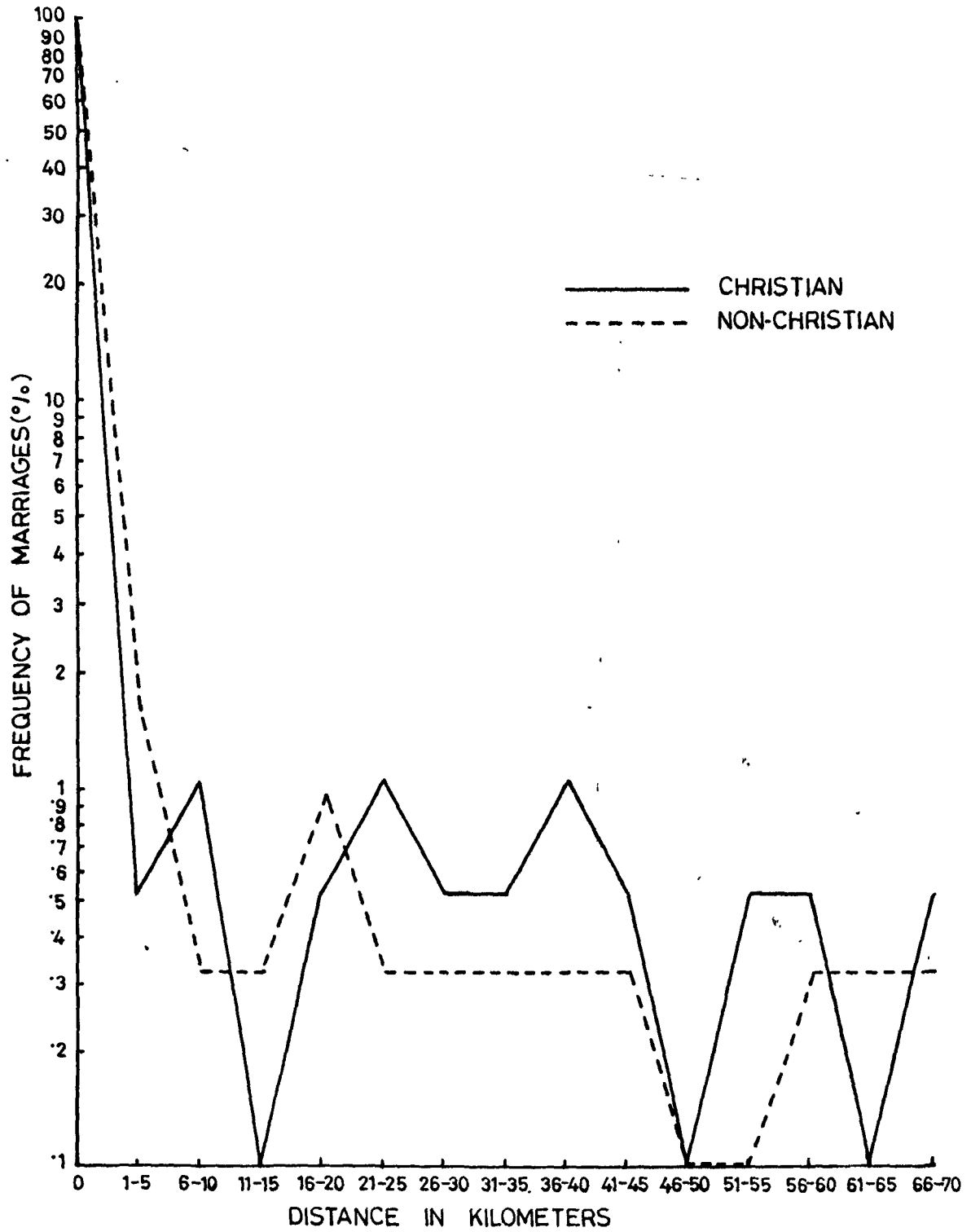
Total - t = 1.5312, P > 0.05

6.3 Marital distance

Marital distance, i.e. the distance between the birth places of spouses, has received a special attention to the study of population genetics, because it is very helpful in understanding the variations in genetic structure of a population (Majumdar, 1977). Table 20 shows that the mean marital distance is 2.30 ± 0.63 Km among the Christian and 1.28 ± 0.35 Km. among the non-Christian section. So, it shows that the mean marital distance is slightly higher in case of the Christian than in case of the non-Christian. But there is no significant difference in respect of mean marital distance between Christian and non-Christian sections of the War Khasi.

With respect to income levels, it is found that the mean marital distances are 0.33 ± 0.46 ; $4.76 \pm$

Fig.3 DISTRIBUTION OF MARITAL DISTANCES
(BASED ON LOGARITHM)



1.55 and 4.65 ± 2.57 Km among the Christian section, and 1.25 ± 0.48 ; 0.94 ± 0.47 and 3.05 ± 1.57 Km among the non-Christian section, in the low, middle and high income groups respectively. The table further shows that the mean marital distance tends to increase as the income level increases in both the sections of the population. It is also noticed that the marriages within 25 km have taken place in the frequency of 2.83%, 3.17% and 4.37% among the Christian and 3.18%, 2.54% and 5% among the non-Christian, in the low, middle and high income groups respectively. It is also seen that among the Christian, all marriages in the low income level are restricted within 20 Km, but in case of the non-Christian, 3 (i.e. 1.91%) marriages in the low income level are found to have taken place beyond the distance of 20 km. Table 20 (a) shows the binomial distribution of marriage distances among the Christian and the non-Christian section of the War Khasi. It indicates that the distribution of marriage distance is leptokurtic and not normal. It holds good for both the sections since both γ_1 and γ_2 are greater than twice of their respective standard errors and β_2 is greater than 3 (Chambers, 1958). Fig. 3 shows the graphic distribution of marital distances in the Christian and non-Christian sections of the War Khasi population.

Table 20(a) Binomial distribution of marital distances

Section of population	Mean \pm S.E.	β_1	β_2	$\gamma_1 \pm$ S.E.	$\gamma_2 \pm$ S.E.
Christian	2.30 ± 0.63	14.3957	16.0617	3.9742 ± 0.1768	13.0617 ± 0.3536
Non-Christian	1.28 ± 0.35	28.4477	31.3707	5.3360 ± 0.1380	28.3707 ± 0.2760

6.4 Consanguineous Marriage

Consanguineous marriage seems to be very uncommon among the War Khasi. As far as the present study is concerned, only two cases of cross-cousin marriages have been reported : one in the Christian and the other in the non-Christian. Among the Christian, it is found that there is one case of first cousin marriage out of 192 marriages, whereas among the non-Christian, it is a marriage between second cousins (Figure 4). So, the frequency of consanguineous marriages is only 0.52% in the Christian and 0.32% in the non-Christian. The coefficient of inbreeding (F) is 0.015625 in case of the first cousin marriage among the Christian, and it is 0.003906 for the second cousin marriage among the non-Christian. So, it seems that among the War Khasi - both Christian and non-Christian sections - marriage between blood relations is not at all a social norm. It may be a recent phenomenon that results from a very low marital distance.

Table 21. Admixture rate

Section of population	Both parents from the same population	One parent from another sub-population or another population	Both parents from another sub-population or another population	Total	Admixture rate(%)
Christian	978	33	9	1020	2.50
Non-Christian	1310	11	6	1327	0.87

Admixture rate

The admixture rates have been calculated

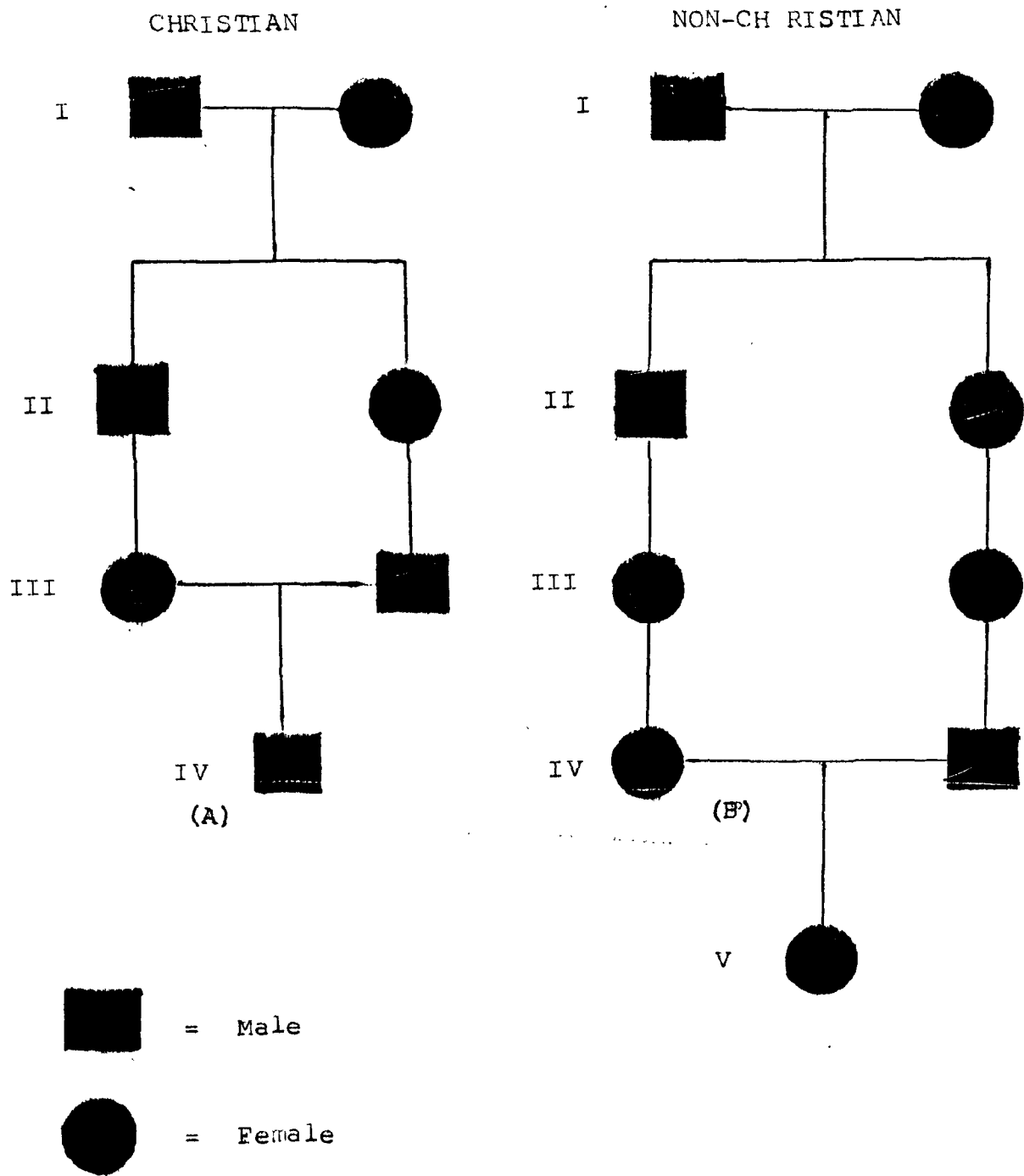


Figure 4. Diagram of an inbred lineage. (A) First cousin marriage, (B) Second cousin marriage.

according to the method suggested by Lasker (1952) and the results are presented in Table 21. Among the Christian out of 1020 individuals, one of the parents in case of 33 individuals and both the parents in case of 9 individuals have come from other populations or sub-populations. Out of 192 marriages in the Christian, 5 cases are found to be the marriages with the Khyriam (Khasi proper), 3 cases with the Pnar (Jaintia) and one case with the Bhoi. Similarly, out of 1327 individuals in the non-Christian section, one of the parents in case of 11 individuals and both of the parents in case of 6 individuals have come from other populations or sub-populations. So, out of 315 marriages, 2 cases are found to be the marriages with the Khyriam, one case with the Pnar, one case with the Garo and 2 cases with the Bengalee. Thus, the admixture rate is found to be 2.50% in the Christian and 0.87% in the non-Christian.

6.6. Effective Population size

Effective population size is the actual number of parents who contribute to the gene pool of the next generation. Its estimation has received a great interest in the studies of population genetics, because it is important for quantifying changes due to random genetic drift. In calculating the effective size of population, we have followed the following formula (Wright, 1938; 1940).

$$N_e = \frac{4N - 2}{V_k + 2}$$

where N_e represents the effective population size, N stands for the number of parents in population, V_k is the variance in the number of gametes contributed to the next gene pool. It has been found that among the Christian, the actual breeding size (318) is 31.18% of the total population (1020) and the effective population size (137) is only 13.43% of the total population or 43.08% of the breeding size (Table 22). Among the non-Christian, the breeding size (446) is 33.61% of the total population (1327) and the effective population size (205) is found to be 15.37% of the total population or 45.96% of the breeding size. Thus, the effective population size is greater in the non-Christian than in the Christian section of the War Khasi.

Table 22. Breeding size, effective population size, coefficient of breeding isolation and genetic drift

Section of population	Breeding size(N)	Effective population size(N_e) (after Wright)	Variance due to drift ($V_k + 2$), = 0.5	Coefficient of breeding isolation (N_{em})
Christian	318	137.45	0.000912	3.44
Non-Christian	446	204.95	0.000610	1.78

6.7. Genetic Drift

From an evolutionary point of view, changes in gene frequencies due to random genetic drift or random sampling are considered to be important in a small and

isolated population (Brues, 1964). In the present study, we have calculated the variance due to random genetic drift according to the following formula (Wright, 1940):

$$V_k^2 d_g = \frac{q(1-q)}{2 N_e}$$

where $V_k^2 d_g$ represents the variance due to drift, q stands for the gene frequency (here taken as 0.5) and N_e is the effective population size.

Following the above formula, it is found that the variance ($V_k^2 d_g$) due to random drift is 0.000912 among the Christian and 0.000610 among the non-Christian section of the population (Table 22).

6.8 Coefficient of Breeding Isolation

Wright (1940) has suggested that differentiation due to drift for a given gene frequency depends upon the coefficient of breeding isolation ($N_e M$). Table 22 shows that the coefficients of breeding isolation in the Christian and the non-Christian are 3.44 and 1.78 respectively. So, in both the sections of the populations, the effect of random drift is quite perceptible.

6.9. Selection Intensity

Natural selection is one of the most powerful evolutionary forces that brings about changes in the genetic make up of a population. Crow (1958) has proposed an index which is known as index of total selection inten-

sity (now called the index of opportunity for selection) by taking into account the differential fertility and mortality. The index is separated into two components known as the index due to fertility and the index due to mortality. Then, Crow has combined the two indices to calculate the index of opportunity for selection which is as follows:

$$I = I_m + \frac{I_f}{P_s} ; \quad I_m = \frac{P_d}{P_s} ; \quad I_f = \frac{V_f}{(\bar{X})^2}$$

where,

- I = Index of total selection intensity;
- I_f = index of selection due to fertility;
- I_m = index of selection due to mortality;
- \bar{X} = average number of livebirths per woman of completed fertility (i.e., 40 years and above);
- V_f = variance in the number of livebirths due to fertility;
- P_d = proportion of premature deaths (i.e., deaths before 15 years of life);
- P_s = proportion of survivors ($P_s = 1 - P_d$);

The above formula proposed by Crow, has been modified by Johnston and Kensinger (1971). They have taken into consideration the prenatal mortality and suggested the following formula:

$$I = I_{me} + \frac{I_{mc}}{P_b} + \frac{I_f}{P_b \times P_s} ; \quad I_{me} = \frac{P_{ed}}{P_b}$$

$$I_{mc} = \frac{P_{ed}}{P_s} ; \quad I_f = \frac{V_f}{(\bar{X})^2} ;$$

where,

- I = index of total selection intensity;
- I_{me} = index of selection due to embryonic mortality (i.e. prenatal mortality);
- I_{mc} = index of selection due to child mortality (i.e. mortality before 15 years of age);
- I_f = index of selection due to fertility;
- P_{ed} = proportion of embryonic deaths (i.e. prenatal deaths);
- $P_b = 1 - P_{ed}$ (proportion of survivors to birth);
- P_d = proportion of child deaths (i.e. died before 15 years of age);
- $P_s = 1 - P_d$ (proportion of survivors, birth to reproductive age);
- \bar{X} = mean number of live-births per woman of completed fertility (i.e. 40 years and above);
- V_f = Variance in number of live-births due to fertility.

Livingstone and Spuhler (1965) have suggested that if the index of total selection intensity comes to zero, it means that there will be no change in the genetic make up of a population through selection.

Table 23. Parameters used in calculating selection intensity.

Parameters	Christian	Non-Christian
Number of mothers aged 40 years and above	76	105
Number of reported pregnancies	516	697
Number of live-births	475	648
Proportion of survivors to birth (P_b)	0.9147	0.9225
Proportion of child death (i.e. deaths before 15 years) P_d	0.1284	0.1528
Proportion of embryonic deaths (P_{ed})	0.0853	0.0775
Mean No. of live-births per mother aged 40 + years (\bar{x})	6.2500	6.1714
Variance (V_f)	7.2138	8.5805

Table 24. Indices of selection potential in the Christian and the non-Christian

Section of population	According to Crow (1958)			According to Johnston and Kensinger (1971)			
	I_m	I_f	I	I_{me}	I_{mc}	I_f	I
Christian	0.1473	0.1847	0.3592	0.0933	0.1473	0.1847	0.4860
Non-Christian	0.1804	0.2253	0.4463	0.0840	0.1804	0.2253	0.5679

In the present study we have taken into consideration only those mothers who have reached 40 years and above, since most of the published data show that such mothers have been taken into consideration to find out the index of selection intensity. In some recent publications, some authors have considered only those mo-

them aged 45 years and above (Barua, 1983; Murthy and Ramesh, 1978 and others). It has already been reported by Das and Ghosh (1988), Talukdar (1971), Mukherjee (1972) and others that fertility declines drastically, when mother reaches 40 years of age. In the present study, we have also seen the same trend. Consequently, we have taken into consideration the reproductive performances of those mothers who are aged 40 years and above and also to make the present findings comparable with the available data on other populations. Table 23 shows that there are 76 mothers in the Christian and 105 in the non-Christian, who are aged 40 years and above and they have 516 and 697 pregnancies respectively. So, the mean number of live-births per mother is 6.2500 in the Christian and 6.1714 in the non-Christian with corresponding variance of 7.2138 and 8.5805 respectively. The proportions of mortality before reproductive age are 0.1284 and 0.1528 in the Christian and non-Christian respectively. The proportions of embryonic deaths (P_{ed}) are 0.0853 and 0.0775, and the proportions of survivors to birth (P_b) are 0.9147 and 0.9225 in the Christian and the non-Christian respectively. Table 24 shows the index of total selection intensity calculated according to Crow's formula (1958) as well as according to the modified method suggested by Johnston and Kensinger (1971). It is found that the I (according to Crow's formula) is higher in the non-Christian (0.4463) than in the Christian (0.3592). It further shows that

differential fertility contributes more in the total opportunity for selection in case of both the sections of the population. According to Johnston and Kensinger's modified method, the I is 0.4860 in the Christian and 0.5679 in the non-Christian, and the I_{me} , I_{mc} and I_f are 0.0933, 0.1473 and 0.1847 respectively among the Christian, and 0.0840, 0.1804 and 0.2253 respectively among the non-Christian. It indicates that prenatal and postnatal mortality contributes more towards the total selection intensity. It may also be seen that the index of total selection intensity according to Johnston and Kensinger's method shows higher value than that calculated according to Crow's formula in both the Christian and the non-Christian section of the War Khasi. It is due to the fact that Johnston and Kensinger have taken embryonic deaths into consideration to calculate the index of selection intensity. So, fertility contributes more to the total selection intensity in case of Crow's formula, but it just reverse in case of Johnston and Kensinger's modified method in which mortality shows its higher contribution towards the total selection intensity. It is true for both the sections.

CHAPTER VII. DISCUSSION

In the present chapter, an attempt will be made to compare the present findings with those in other populations-both Indian and non-Indian.

Age, Sex and Marital Status

The demographic data presented so far reveal that the War Khasi population - both Christian and non-Christian sections - is highly progressive according to Sundberg's classification of population. The overall sex ratio is very near to 1:1 in the Christian, but slightly high in the non-Christian (1.16:1). The overall sex ratio among the non-Christian section is higher than that among the Bhill (111.53) and Garasia (114.54) of Rajasthan (Sarkar, 1989), Chenchu (99.2) of Andhra Pradesh (Sirajuddin and Basu, 1984), etc. It is also higher than that reported for the Dinka tribe (Roberts, 1956), and the Peruvian Cachinahua (Johnston et al., 1969). But it is not as high as that among the Mahishya (Mukhopadhyay, 1981) and the Samaritan (Bonne, 1963).

It has been observed that the mean age at marriage in both the sections is higher than that among the Christian (19 years) and the non-Christian (18 years) Khasi as reported by Nag (1965). It, however, reveals that the mean age at marriage among the non-Christian War Khasi (19.44 ± 0.25 years) is slightly higher than that among the non-Christian Khasi (Nag, 1965). In this connection, it may be noted that Nag has not mentioned

which sub-population of the Khasi he had studied. Thus, compared with other Indian populations, it is seen that the mean age at marriage in the Christian and non-Christian sections of the War Khasi is moderately high. For example, it is 16.8 years in the Kashmiri Pandit (Ram, 1989), 16.87 years in the Maheshwaris of Rajasthan (Gandhi 1989), 16.45 years in the Kond of Orissa (Devi, 1975), 14.35 years in the Brahman of Maharashtra (Rakshit, 1962) and others. This high mean age at marriage is associated with a fairly high mean age at first child birth. The mean age at first child birth among the Christian and non-Christian women of the present study is higher than that in many Indian populations, like the bagdi (16.70 years) of West Bengal (Sen, 1953), Brahman (19.19 years) of Maharashtra (Rakshit, 1962), Kond (19.19 years) of Orissa (Devi, 1975), Muslim (19.15 years) of Khandua (Saini, 1989), and others. However, the mean age at first child birth among the Christian, though it is greater, is nearer to that found in the Nayar (20.74 years) of Kerala (Sen, 1953).

Multiple Marriages

The practice of marrying more than one time after the death or divorce from the previous spouse(s) seems to be more common in the non-Christian section (26.38%) than in the Christian (7.51%) section of the War Khasi population. The frequency of multiple marriages in the

non-Christian is higher in comparison with the Pahira of Ajodhya hills (Basu, 1969), but not as high as in the Kota (Ghosh, 1976). In case of the Christian section of the population, the frequency of multiple marriages is lower than that in the above two populations, i.e., the Pahira and the Kota. It seems that among the non-Christian, marriage appears to be more unstable than in the Christian. This may be due to the fact that in Christianity, frequent change of mate is not generally encouraged. It, however, suggests that in both the sections of the War Khasi, men are slightly more prone to change their mates than their women counterparts.

Infertility

In the present study, it is found that the rate of infertility is higher in the non-Christian than in the Christian. This rate in both the sections of the War Khasi is still higher than that in the Sherpa of Kalimpong and Upper Khumbu (Gupta, 1980), but certainly not as high as that reported for the Kota (Ghosh, 1976), Pahira (Basu, 1969), Chenchu (Sirajuddin and Basu, 1984), Nama-sudra of Balaramchak in West Bengal (Mukhopadhyay, 1981), Gajngang Indian (Salzano, 1961), etc.

Fertility

Fertility is one of the most important demographic parameters, and the fertility rate varies considerably from one human population, to another. The active

reproductive period generally lies between 15 and 49 years of age. It rarely starts before the age of 15 years. It reaches the peak-point in the early 20s and then it slows down gradually. So, births occur only in small proportion to women aged 40 years and above (Henry, 1961). During this reproductive period, fertility performances of the mothers vary considerably, and depend on various bio-social factors. From the anthropological point of view, these differentials in reproductive capacity or fitness are the effectiveness of natural selection operating in human population. In other words, if all the individuals have contributed equally to the next generation, there will be no selection. "It is only where there are differences in reproductive performance that natural selection may occur" (Johnston, 1973).

Among the War Khasi, the Christian as well as the non-Christian, experience a fairly high rate of fertility. The completed family size among the Christian (6.69 ± 0.39) and the non-Christian (6.61 ± 0.35) is higher than that found in the Lachen population of northern Sikkim (Das et al., 1982), Namasudra of West Bengal (Mukhopadhyay, 1981), Pahira of Ajodhya hills (Basu, 1969), Mallia of Orissa (sahu, 1983), etc. But it is not as high as that reported for the Mahishya of West Bengal (Mukhopadhyay, 1981), Lachung population of northern Sikkim (Das et al., 1982), Sherpa of Kalimpong (Gupta, 1980), Mirpur population of West Bengal (Basu et al., 1980), and others.

Compared with the non-Indian populations, it is much higher than that in many European countries, like Denmark (2.37), Finland (2.63), Ireland (3.60), Norway (2.48), Sweden (2.13), Spain (2.70), etc. as compiled and reported by Borgeois-Pichat (1986).

With respect to all married women aged 45 years and above, it is found that the mean number of live-births among the Christian (4.81 ± 0.24) and the non-Christian (4.66 ± 0.18) is higher than that found in the Christian Khasi (Nag, 1965), and it is much lower than that reported for the non-Christian Khasi (Nag, 1965), Jaintia (Deka, 1989), Hajong (Barua, 1983), Sonowal Kachari (Deka, 1978), etc. It is also higher than that found in the Kota (Ghosh, 1976), Dule Bagdi (Talukdar, 1971), Kond of Orissa (Devi, 1975), but it is much lower than that reported for the Irula of Kerala (Basu, 1967), Chenchu of Andhra Pradesh (Sirajuddin and Basu, 1984), Muria Joria of Madhya Pradesh (Saha, 1981), Mallia of Orissa (sahu, 1983), Bhoksa of Uttar Pradesh (Garg et al, 1980), Brahman of Maharashtra (Rakshit, 1962), Dhurwa of Madhya Pradesh (Rakshit, 1959), Santal and Maler of Bihar (Sarkar 1944) and others. In comparison with some non-Indian populations, this mean number of live-births among the non-Christian is more or less the same as that found in the Ramah Navajo (Morgan, 1973), and it is much lower than that reported for the Dinka (Roberts, 1956), Muslim Peasant of Bangladesh (Neel, 1958), etc.

In comparison with other Indian populations (like those studied by Basu, 1969; etc.), the fertility ratio is quite low in both the sections. It is slightly higher in the Kota (Ghosh, 1976) than those found in both the sections. Among the non-Christian (62.10), it is almost equal to those found in the Dule Bagdi of 9 village groups (Talukdar, 1971). Compared with the non-Indian populations, the child woman ratio in both the sections of the War Khasi, is much lower than those reported for the Hutterite (Eaton and Mayer, 1953), Dinka (Roberts, 1956), Peruvian Cachinahua (Johnston et al., 1969), etc. But it is not as low as that found in Jamaica, Papago, U.S.A. (Bonne, 1963), and others. It may be mentioned that this low fertility ratio may be due to the fact that about 45% of all the women aged 15-49 years in the Christian and 42% of them in the non-Christian are unmarried at the time of the present survey, and consequently their contribution in the children population (aged 0-4 years) is nil.

In both the Christian and non-Christian sections, the mean number of live-births per married woman increases as age advances. The mean number of live-births among the Christian is almost equal to that found in the Jaintia (Deka, 1989), but it is slightly lower than that among the Hajong (Barua, 1983). In comparison with other Indian populations, it is found that the mean number of live-births in both the sections of the War Khasi is much

higher than those in the north and south Andamanese (Sarkar, 1953), Dorla and Dhurwa of Madhya Pradesh (Rakshit, 1959), Pahira of Ajodhya hills (Basu, 1969), Kond of Orissa (Devi, 1975), Bhill and Garasia of Rajasthan (Sarkar, 1989), Maler of Bihar (Sarkar, 1944) and others. The mean number of live-births per mother among the non-Christian, is lightly lower than that found in the Sherpa of Kalimpong (4.74), but is much higher than that in the Sherpa of Upper Khumbu (3.91) as reported by Gupta (1980).

Mortality

Mortality is also a good indicator to understand the good health status of a population, and it is one of the most vital demographic parameters. During the 17th century, the increase in the population of many European countries, following the Industrial revolution, was due to the decrease in mortality rate (Bhande and Kanitkar 1985). This is also true, in the present time, for most of the developing countries, like India, etc. Among the War Khasi, it is found that the infant mortality rate is 6.89% in the Christian and 8.55% in the non-Christian, and the juvenile mortality rate is 3.68% among the Christian and 3.64% among the non-Christian section of the population. The frequency of infant mortality rate among the various caste populations of Assam, like the Brahmin, Kayastha, Kalita, Kalbarta, etc. varies between 7.12% and 19.00% (Das and Das, 1982). Similarly, Barua (1983) has reported that the infant and juvenile mortality rates

among the Hajong are 15.64% and 15.03% respectively. So, it reveals that in comparison with these populations of the north eastern region, the infant as well as the juvenile mortality rate among the War Khasi (both Christian and non-Christian) is moderate, especially in case of juvenile mortality, which is low.

Turning to the other populations, Talukdar (1971) has reported that the juvenile mortality rates among the Dule Bagdi of 9 and 12 village groups are 20.5% and 21.2% respectively. Similarly, Gupta (1980) has reported that the juvenile mortality rates among the Sherpa of Kalimpong and Upper Khumbu are 17.12% and 13.21% respectively. Thus, it appears that among both the Christian and non-Christian sections of the War Khasi, the juvenile mortality rate is remarkably low. The infant mortality rate among the non-Christian is, however, higher than those found in the Lachung of northern Sikkim, which is 7.63% (Das, et al., 1982), the Sherpa of Kalimpong and Upper Khumbu, which is 6.58% and 7.21% respectively (Gupta, 1980), but it is lower than those found in the Chenchu (11.68%) of Andhra Pradesh (Sirajuddin and Basu, 1984), Namasudra (13.40%) and Mahishya (13.25%) of West Bengal (Mukhopadhyay, 1981) and some other populations. The infant mortality rate among the Christian is, however, nearer to that found in the Mirpur population (6.15%) of West Bengal (Basu et al., 1980) and the Sherpa (6.58%) Kalimpong (Gupta, 1980).

Therefore, it shows from the above discussion that the War Khasi - both Christian and non-Christian sections - have moderate fertility and infant mortality rates but the juvenile mortality rate is quite low.

Reproductive wastages

The rate of reproductive wastages (spontaneous abortion and still-birth) is higher in the non-Christian (8.09%) than in the Christian (7.88%). The rates of abortion (spontaneous abortion) and still birth have separately been found to be 4.56% and 3.11% in the Christian and 4.64% and 3.46% in the non-Christian respectively. The rate of reproductive wastages among the Hindu populations of Assam, like the Brahmin, Kayastha, Kumar, etc. varies from 1.52% to 3.35%, and among the Mongoloid populations, like the Ahom, Moran, etc. varies between 0.75% and 4.85% (Das and Das, 1982). Thus, it shows that among the War Khasi (both Christian and non-Christian), the rate of reproductive wastages is high. The rate of still-birth in both the sections is, however, lower than that of the Shyam of Tarung (5.31%), but higher than that found in the Ahom (3.88%), Mishing (4.72%) Moran (2.95%), Shyam of Khamiyung (2.11%), etc. as reported by Das (1985). In case of the abortion rate, it is seen that in both the sections of the War Khasi, it is much higher than that in the Hajong of Garo Hills (Barua, 1983), Maheshwaris of Rajasthan (Gandhi, 1989), Bhill and Garasia of

Rajasthan (Sarkar, 1989), but it is not as high as that reported for the Shyam (6.36%) of Assam (Das, 1985), Muslim (8.59%) of Madhya Pradesh (Saini, 1989) and some other populations. It, however, shows that the rate of reproductive wastages is more among the War Khasi (both Christian and non-Christian) than that found in most of the neighbouring populations.

Multiple Births

In the present study, it is found that out of 899 pregnancies in the Christian, 13 cases have been terminated into twin births. Thus the frequency of multiple births is 1.43% of the total live-births and 1.33% of the total pregnancies in the Christian section of the War Khasi. Among the non-Christian, this frequency is 0.91% of the total live-births and 0.84% of the total pregnancies. Compared with the rate of multiple births in India (1.08% of the total pregnancies) as given by Sarkar (1958), this rate is marginally more in the Christian, but it is considerably less in the non-Christian. The rate of multiple births among the Christian is higher than that of the Hajong (1.00%) reported by Barua (1983), and it is about 4 times lower than that found among the Mallia (5.18%) of Orissa (Sahu, 1983).

It may be noted that this rate of twin births among the Maheshwaris of Rajasthan (Gandhi, 1989) is even lower than that in the non-Christian. As far as the pre-

sent study is concerned, no multiple births other than twin birth has been reported. The frequency of concordant (like sexed) twins in the Christian is 66.67% and the non-concordant (unlike sexed) twins 33.33% of the total twin births. Among the non-Christian, the rates of concordant and non-concordant twins are 80% and 20% respectively. The expected ratio, according to Weinberg's method, between monozygotic and dizygotic twins among the Christian (1:1) is similar to that theoretically expected ratio (Race and Sanger, 1975), but is much higher among the non-Christian (3:1).

Social Correlates

It has been seen from the review of literature presented in the Chapter II that many studies (Pearl, 1939; Lorimer et al., 1954; Davis and Blake, 1956; UN, 1967; Mosley, 1978; Das, 1969; Husain, 1970; Mitra, 1978; Rodgers, 1979; Rajalakshmi, 1981; Bharati, 1981; and others) have reported that social correlates, like age at marriage, religion, education, economic condition, etc. have played very important roles in influencing fertility and mortality rates. In the present study, we have also seen that some of these factors have a great influence on fertility and mortality rates.

It is generally believed that age at marriage has an inverse effect on fertility rate (Balakrishna, 1951; Dore, 1953; Agarwala, 1962; Driver, 1963; Majumdar, 1968;

Bumpass, 1969; Myon and Gordon, 1971; Raman, 1973; Mandelbaum, 1974; Goyal, 1974; World Bank, 1974; etc). Among the War Khasi - both the Christian and non-Christian sections - the average number of live-births per mother is found to decrease with the rise in age at marriage. Thus, it reveals that age at marriage has an inverse relationship with fertility rate.

Similarly, economic condition, based on monthly per capita income of the household, has also been found to have an inverse effect on fertility and mortality rates. The average number of live-births per mother decreases with the rise in the level of income in both Christian and non-Christian sections of the population. Among the Christian section, the infant and the juvenile mortality rate have declined gradually with the rise in the level of per capita income of the household. But this trend is not very clear among the non-Christian, in which the high income group experiences higher infant and juvenile mortality rates than the middle income group.

Education of the mother is another important factor which is, to a great extent, responsible for bringing down both the fertility and mortality rates (UN, 1961; Kiser, 1971; Simon, 1974; Dutta and Seal, 1974; Cochrane, 1979; Westoff, 1986; etc). In the present study, it has also been seen that the fertility rate as well as the mortality rate tends to decline gradually with the rise in educational standard of the mother, irrespec-

tive of religion. It may be mentioned that this trend is quite perceptible in case of the Christian, though not very clear in case of the non-Christian section of the War Khasi. Education of the mother upto above primary level is, however, clear to have an inverse effect on fertility and mortality rates, irrespective of religion.

The effect of religion on fertility and mortality is also perceptible, though it is not very clear in the present study. It is found that the Christian have a higher fertility rate than the non-Christian. It is again seen that the infant mortality rate seems to be higher in the non-Christian than in the Christian. But the juvenile mortality rate is slightly higher in the Christian than in the non-Christian. However, the difference in respect of fertility, infant and juvenile mortality rates between the Christian and the non-Christian, is almost not statistically significant. Thus, it indicates that religion seems to have played some role in influencing the fertility and mortality rates among both the sections of the War Khasi, who live in more or less similar ecological setting, though it is not very effective.

Family Planning

Despite the fact that the Government of India has included the family planning in the National Programme right from the beginning of the First Five Year Plan in 1951 (Bhande and Kanitkar, 1985). Till today, the family

planning movement has not yet gained sufficient momentum in the North-Eastern region of the country, particularly in rural areas. As far as the present study is concerned, no couple, in either of the sections, has been found to have adopted any family planning method. This is altogether a different kind of problem to probe in, and it is beyond the scope of the present study. But it may be taken as granted that the reproductive performances of mothers, recorded in the present study, were by and large in natural condition.

Clan Exogamy

Like the Khyntiam, Pnar, Bhoi and Lyngngam, the War Khasi are divided into a large number of clans. Each clan is strictly exogamous. So, an individual is not supposed to marry within his/her own clan. Marriage within one's own clan is regarded as a taboo (Cantlie, 1974; Gurdon, 1990). Inter-marriages between linked clans or lineages (locally known as Iateh Kur) are also prohibited (Gurdon, 1990; Das Gupta, 1984). The rule of clan exogamy has been observed strictly by both the Christian and the non-Christian section of the War Khasi. As far as the present study is concerned, no case of violation against the rule of clan exogamy has been observed. Thus, it reveals that clan exogamy is operating strongly in both the sections of the War Khasi. It may be noted that there is no clan concept in Christianity. But in the present

study, it has been found that even the section that was converted into Christianity about 150 years back (Das Gupta, 1984), strictly adheres to the rule of clan exogamy, which is a social rule in traditional religion of the War Khasi. So, it shows that among the War Khasi, traditions and customs die very hard.

Consanguineous Marriage

It is also found that marriages between blood relations are very unusual among the War Khasi. Out of 192 marriages among the Christian, one (i.e. 0.52%) case is found to be a marriage between the first cousins and among the non-Christian section, one (i.e. 0.32%) case out of 315 marriages, is found to be a marriage between the second cousins. Thus, it seems that consanguineous mating among the War Khasi, irrespective of religion, is not at all a social norm. Gurdon (1990) and Chattopadhyay (1941) have reported that marriage with mother's brother's daughter or with father's sister's daughter is not socially allowed in the War Khasi, whereas Das Gupta (1984) is of the opinion that marriage with mother's brother's daughter is not theoretically prohibited, especially after the death of the maternal uncle. In the present study, we have come across only two such cases of consanguineous marriage - one among the Christian and the other among the non-Christian section of the population. As mentioned earlier, it does not certainly seem to be

a normal practice in either of the two sections of the War Khasi. Had it been a traditional practice, we should have come across many more cases of consanguineous marriages. It is quite likely that the two cases of consanguineous mating reported in the present study, show a departure from the existing social norm and they must be of recent happenings. So, the present finding, in no way, supports the contention made by Das Gupta (1984). A thorough social-anthropological investigation is, however, very much needed to understand all types of marriage alliance among the War Khasi.

It is theoretically well known that the inbreeding coefficient decreases with the increasing matrimonial distance (Malécot, 1967; Salzano and Freire Maia, 1970; Majumdar and Malhotra, 1979; etc). So, it shows that when the marital distance decreases, there will be a greater probability for consanguineous matings. In the present study, we have seen that there is a strong tendency for village endogamy. (we shall discuss it afterwards) and consequently, the breeding size of the population is getting smaller and smaller, which might have led both the sections of the War Khasi to make a departure from the standard social norm of avoiding marriages between close relatives.

Marital Distance

The marital distance, i.e., the distance between

the birth places of spouses, is very helpful in understanding the variations in genetic structure of a population (Saheb et al., 1982). It is also useful in predicting the degree of inbreeding (Majumdar and Malhotra, 1979). The difference in reproductive performances of the individuals are also considered to be largely influenced by the differences in mating system and marital distance (Rao and Murty, 1988).

The mean marital distance among the War Khasi - both Christian and non-Christian - is very low in comparison with other Indian populations (Majumdar and Malhotra 1979; Rao and Murty, 1988; Saheb et al., 1982; Sharma, 1989; and others). It is found the mean marital distance is marginally higher in the Christian (2.30 ± 0.35 Km) than in the non-Christian (1.28 ± 0.35 Km) section of the population. The normality test shows that the marital distribution is not normal, but leptokurtic in both the sections.

Rao and Murty (1988) have reported that the mean marital distance is higher in the forward castes than in the backward ones. Among the War Khasi, it is also found that the mean marital distance tends to increase with the rise in income level, and it holds good for both the Christian and non-Christian sections of the population.

Admixture

The rate of admixture among the War Khasi

- in both the Christian and non-Christian sections appears to be very low in comparison with other Indian populations (Basu, 1969; etc.). But it is not as low as that found among the Kota (Ghosh, 1976). It is also very low in comparison with other populations (like those studied by Lasker, 1960; Roberts, 1956; Lasker and Kaplan, 1964; Salzano, 1964; etc). Considering both the rate of village endogamy (we shall discuss it later) and the very low mean marital distance in both the sections of the War Khasi, it is quite expected that with the low rate of admixture coupled with a strong tendency for village endogamy, each of the War Khasi villages in both the religious sections will lose its genetic heterogeneity gradually and will become more and more genetically homogeneous. There is a possibility that it may eventually lead to micro-heterogeneity between the villages within each section of the War Khasi, and each of the villages in the Christian and the non-Christian sections will perhaps emerge as **genetic isolate**. Only a future research can prove this contention.

Genetic Drift

Genetic drift or random sampling is used to refer to as a dispersive phenomenon that may bring about changes in gene frequencies of a population, particularly in a small and isolated population (Johnston, 1973). Its magnitude is always determined by the effective population size. In modern society, its effect is generally very

much imperceptible due to the advancement of science and technology along with other social interactions which may result in high rate of admixture. However, as far as the Mandelian population (a population which shares a common gene pool) is concerned, it has been found that in our country, many caste groups or tribes, like the War Khasi, etc. are endogamous with little or no intermixture with the others (Sen, 1973).

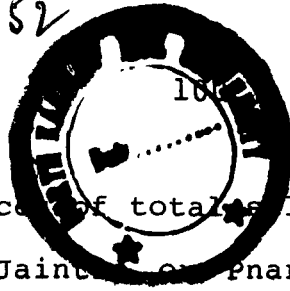
Wright (1940) has suggested that differentiation due to random drift for a given gene frequency depends on the coefficient of breeding isolation ($N_e M$). If the coefficient of breeding isolation is less than 0.5, changes in gene frequencies due to drift are very great. But the differentiation due to drift is important, when the coefficient of breeding isolation is less than 5; and changes are still appreciable when the coefficient of breeding isolation is between 5 and 50. But the changes will be imperceptible, if $N_e M$ is greater than 50 (Roberts, 1956; Lasker, 1960). The coefficient of breeding isolation is found to be 3.44 among the Christian and 1.77 among the non-Christian section of the War Khasi. Thus, it indicates that differentiation in gene frequencies due to random genetic drift is important in both the Christian and non-Christian sections of the population. It is found that the effect of drift is more appreciable in this population than in many other populations (Basu, 1969; Basu et al., 1980; Sahu, 1983; Roberts, 1956; Salzano, 1961;

Lasker and Kaplan, 1964; etc), but it is as intense as in the Kota of Nilgiri hills (Ghosh, 1976).

Selection Intensity

Selection is one of the major evolutionary forces that brings about changes in the genetic make up of a population. To understand how selection is operating in both the sections of the War Khasi population, the index of opportunity for selection has been calculated for the Christian and non-Christian sections. Among the War Khasi it is found that selection is operating with a very moderate intensity in both the sections. Reddy and Chopra (1990) have compiled all the results on the indices of selection, calculated according to Crow's formula (1958), on 96 Indian populations. It has been seen that the index of total selection intensity (I) varies from 0.258 in the subgroup of Yanadi tribe (Vasule, 1987) to 2.250 in the Kota (Basu, 1972). The component due to mortality (I_m) ranges from 0.053 among the Yanadi tribe (Vasule, 1987) to 1.062 among the Mala (Rao and Murthy, 1984). The index of selection due to fertility component (I_f) varies between 0.018 among the Sao Tili (Rao and Choudhury, 1983) and 0.815 among the Kota (Basu, 1972). The present finding indicates that the index of total selection intensity (Christian - 0.360 and non-Christian - 0.446) is more towards the lower half of the range, in the Christian as well as in the non-Christian.

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The indices of total selection intensity (I), I_f , and I_m in the Jaintia Pnar calculated according to Crow's formula (1958) are 0.638, 0.125 and 0.456 respectively (Deka, 1989) and 0.401, 0.133 and 0.236 respectively (Khongsdier, 1991). Barua (1983) has reported the same indices among the Hajong of Meghalaya, which are 0.631, 0.131 and 0.443 respectively. Among the Bengali-speaking Muslim of Cachar, these indices are 0.86, 0.31 and 0.43 respectively (Chakravarty, 1976). It reveals that the index of total selection intensity in the Christian as well as in the non-Christian section of the War Khasi is much much lower than those found among the Jaintia and the Hajong of Meghalaya and the Muslim of Cachar in Assam. It may, however, be pointed out that it is similar to that found in the Pnar as reported by Khongsdier (1991).

The index of total selection intensity is the non-Christian, calculated according to the modified method of Johnston and Kensinger (1971), is also similar to that found among the Pnar (Khongsdier, 1991) and the Hajong (Barua, 1983). But it is much lower than that reported by Deka (1989) among the Jaintia (Pnar). It may also be pointed out that the index of selection due to embryonic mortality, i.e.; prenatal death, is much lower among the Hajong than that among the Christian and the non-Christian ($I = 0.032, 0.093$ and 0.084 in the Hajong, Christian and non-Christian respectively), but it is

higher among the Jaintia (Deka, 1989; Khongsdier, 1991). But the index of selection due to child mortality is much lower among the Christian and the non-Christian than that among the Hajong (Barua, 1983) and the Pnar (Deka, 1989; Khongsdier, 1991).

The index of total selection intensity, calculated according to Crow's formula, among the Christian section of the War Khasi is similar to that found in the Mirpur population (0.374) of West Bengal (Basu et al., 1980), the Bhoksa (0.356) of Andhra Pradesh (Garg et al., 1980), and the Sinowal Kachari (0.360) of Assam (Deka, 1978). But it is lower than that reported for many other Indian populations (Ghosh, 1976; Basu, 1969; Talukdar, 1971; Reddy et al., 1987; Saha, 1981; Gupta, 1980; etc.), but higher than that found among the Jalari (0.310) of Andhra Pradesh (Rajanikumari et al., 1985), and the Mahishya (0.275) of West Bengal (Mukhopadhyay, 1981). Among the non-Christian, the I is similar to that reported for the Jatav (0.438) of Uttar Pradesh (Mukherjee, 1974), the Lepcha (0.438) of West Bengal (Mukhopadhyay, 1982), but higher than that in the Mirpur population (Basu et al., 1980), the Namasudra (Roy and Bharati, 1982) and Puram Chote I and II (Basu, 1984).

So, it shows that selective pressure in both the sections of the War Khasi is quite moderate.

Village Endogamy

Village endogamy is an important aspect among the War Khasi. In the present study, of 192 marriages among the Christian, 15 (i.e., 7.81%) are found to be between the villages, whereas among the non-Christian, out of 315 marriages, 18 (i.e., 5.71%) cases are found to be between the villages. So, it seems that marriage within the village is a normal practice in both the sections of the War Khasi. In the Christian section, the frequency of marriages within the same village is 92.19% and it is 94.22% among the non-Christian. It shows that the rate of intra-village marriage is slightly higher among the non-Christian, who are more traditional than the Christian. The tendency for village endogamy is, however, very much in vogue in both the sections of the War Khasi, and consequently, it leads to village endogamy.

Village endogamy is considered to be determined by a number of socio-cultural factors, like property right, barrier of distance, leadership and succession, migration, linguistic barrier, religion, etc. (Ghosh, 1990; Murdock, 1949; Kloos, 1963; Karve and Malhotra, 1968; Sharma et al., 1985 and others). Among the War Khasi, Das Gupta (1984) is of the opinion that local endogamy is not largely determined by the environmental knowledge. He has suggested that the rule of inheritance among the War Khasi (where both sons and daughters share parental

property) is one of the important factors for regulating village endogamy. He says, 'if a man moves out of his village due to marriage alliance it becomes difficult for him to have easy access to the family property'. It may, however, be pointed out that this rule of inheritance is not practised by all sections of the War Khasi, except those in Shella area and some parts of the War Sohra, and Nongshken village in Khyrim state. But village endogamy is the intrinsic pattern among the War Khasi (Nakane, 1967). Nakane argues that owing to the prevalence of duo-local residence, 'visiting marriage must have been a great inconvenience (if a husband's residence is in another village). Her argument is also supported by Das Gupta (1984) and Ghosh (1990). Thus, it seems that village endogamy among the War Khasi is determined by many socio-economic factors. It is a matter of further research for a cultural anthropologist, and it is beyond the scope of the present study.

We have seen that there are low admixture rate, low mean of marital distance, and practice of village endogamy in both the sections of the War Khasi. Besides, the marital relation between Christian and non-Christian is also very low. Each of these phenomena has got certain genetic implications. What effects will they have on genetic structure of these two, apparently endogamous, sections of the War Khasi? It seems that each of the sections of the War Khasi might have already lost or will lose

its genetic homogeneity (gradually) and some sort of micro heterogeneity might be or will be perceptible between villages in each section of the War Khasi. Consequently, the intensity of evolutionary forces like selection, drift, etc. might be or will be of different magnitude for each village in each section of the War Khasi, which might have led or will eventually lead to the formation of several **demes** in each section of the War Khasi. So, it will not be reasonable to consider each section of the present population as an endogamous group from genetic point of view. This contention can only be tested, if in future, a study can be taken up in each village of both the sections of the War Khasi with several genetic markers such as, blood groups, red cell enzymes, serum protein, etc. with a view to understanding the genetic structure of each village. We hope some further studies will throw much more light on what we have suggested here.

CHAPTER VIII

SUMMARY

Physical anthropology is primarily concerned with the study of man as a physical organism in both time and space. Its main objective is to understand the processes of human evolution at both micro and macro levels as well as to find out human variations and the causes of such variations. Till the middle of the present century, the physical anthropologists were largely involved in taxonomic classification of human populations. They mostly used anthropometric techniques. But since the middle of this century, they have shifted their interest from taxonomic research to population genetical research with a view to understanding the various processes of human evolution. They have been gradually realising that along with anthropometric, serological and other techniques, emphasis on demographic research could be beneficial to the study of human evolution and variation. Moreover, anthropological study of population is likely to bring to light some useful estimates of general population trends which are very useful supplement to the formal demographic research and socio-economic planning (Raja, 1960; Macfarlane, 1976; Nag, 1977; Mukhopadhyay, 1981; etc.). Thus, physical anthropology and demography, though the latter generally involves large scale of data with sophisticated-statistical techniques, are closely inter-related. Demographic variables, such as fertility, mortality, etc.

are of great importance to the study of population genetics to understand the various micro-evolutionary processes. For instance, selection is believed to be one of the major evolutionary forces that bring about changes in the genetic make up of a population and operates through differential fertility and mortality. It is true that there is no specific discipline of science which is traditionally known as **Demographic Genetics**. But in the field of population genetics, one deals with those aspects of genetic processes which need consideration of some demographic parameters. In that sense, population geneticists traditionally consider all those population properties, on which the discipline of demography is conceivably concerned.

With this end in view, we propose to undertake a study on bio-social demography among the War Khasi of the East Khasi Hills district in Meghalaya. By 'Bio-social Demography', we mean a study on demographic structure of a population with special reference to some socio-economic factors, such as education, economic condition, age at marriage, mating pattern, etc., and thereby to understand the genetic implications of such parameters.

Objectives of the present study

The objectives of the present study are as follows:-

- a) to describe the demographic structure of the War Khasi - both Christian and non-Christian,

- b) to find out how far the rule of clan exogamy is operating among the Christian and non-Christian War Khasi;
- c) to find out the effects of some socio-economic factors, like education, income, age at marriage, marriage pattern, etc. on reproductive behaviour of these two sections of the War Khasi;
- d) to determine the rates of infant mortality and reproductive wastages in these two sections of the War Khasi;
- e) to find out the rate of admixture with other Khasi and non-Khasi groups;
- f) to find out how evolutionary forces, like selection, drift, etc. are acting on these two sections of the War Khasi;
- g) to determine the marriage distance and its genetic implications;
- h) to compare the present findings with the existing data on other Indian and non-Indian populations as far as possible.

In chapter II, we have made a brief review of the existing literature on demographic research, particularly those related to population genetic studies.

The field work of the present study was conducted in five villages falling under the War area during the period from September to November, 1990.

In chapter III, we have described the materials that we have collected for the present study and the methods that we have adopted in connection with the collection of data.

Since the War Khasi are distributed in more than 250 villages, we have made a 2% statistical-random sampling of the War villages. Consequently, we have covered five villages, namely, Kenbah, Mawsiangei, Nongla, Wahumlein and Lapalang in the present study. The total number of households in these five villages is altogether 366, of which 152 are Christian and 214 non-Christian households. We have done a complete enumeration of these five villages.

In chapter IV, we have presented the demographic characteristics of the two sections of the War Khasi population, i.e., the Christian and the non-Christian.

PRESENT FINDINGS

The following points may be noted:-

1. Both the Christian and non-Christian sections of the War Khasi seem to be of progressive type, according to Sundberg's classification of population.
2. The overall sex ratio is very near to the ideal sex ratio of 1:1 in the Christian section, whereas in the non-Christian section, it is 1.16:1 (Tables 2a and 2b).
3. The population pyramid depicts that the base is quite broad in both the Christian and non-Christian sections of the War Khasi. It indicates a fairly high rate of fertility in both the sections (Figure 2).
4. The mean age at marriage in the Christian is 20.04 ± 0.32 years and in the non-Christian 19.44 ± 0.25 years (Table 4).

5. The mean age at first child birth among the Christian is 22.31 ± 0.32 years and among the non-Christian 21.96 ± 0.25 years (Table 5). It shows that the mean age at first child birth in both the sections is higher than that found in many Indian populations.
6. The frequency of multiple marriages is 7.51% in the Christian and 26.38% in the non-Christian (Table 3).
7. The infertility rate is 7.51% in the Christian and 8.05% in the non-Christian (Table 6).
8. The completed family size is 6.69 ± 0.39 and 6.61 ± 0.35 in the Christian and the non-Christian respectively.
9. The fertility ratio (i.e., the number of children aged 0 - 4 years per 100 women aged between 15 - 49 years) is found to be 61.48 and 62.10 in the Christian and the non-Christian respectively.
10. It is found that the mean number of live-births per married woman, living continuously in wedlock, is higher among the Christian than among the non-Christian. (Table 8).
11. In both the Christian and non-Christian sections, the mean number of live-births per married woman increases as age advances. The mean number of live-births per mother in the Christian is 4.81 ± 0.24 and in the non-Christian 4.66 ± 0.18 (Table 10).
12. Taking all the married women together during their active reproductive period, i.e., 15 - 49 years, it is found that the mean

number of surviving children per married woman is 4.00 ± 0.23 in the Christian and 3.75 ± 0.19 in the non-Christian (Table 11)

13. It is found that 8.96% of the Christian married women and 10.44% of the non-Christian married women have no surviving children.
14. The infant and the juvenile mortality rate are 6.89% and 3.68% respectively in the Christian section (Table 12). In the non-Christian, these rates are 8.55% and 3.64% respectively. Between these two sections of the population, there is no significant difference in respect of the two rates.
15. Taking into consideration only those mothers aged 45 years and above, the infant and the juvenile mortality rate in the Christian section are 8.70% and 5.12% respectively (Table 12). In the non-Christian section, these two rates are 11.82% and 4.84% respectively. In case of the infant mortality rate, there is no significant difference between these two sections of the population. But in case of the juvenile mortality rate, there is significant difference between these two sections (Table 12a).
16. The rate of reproductive wastages (spontaneous abortions and still-births) is 7.88% in the Christian and 8.09% in the non-Christian. The rate of abortions (spontaneous) and still-births are 4.56% and 3.11% and 4.64% and 3.64% in the Christian and the non-Christian respectively (Table 13).

17. The frequency of multiple births among the Christian is 1.43% of the total live-births and 1.33% of the total pregnancies. In the non-Christian, it is 0.91% and 0.84% respectively (Table 14).
18. The frequencies of concordant and non-concordant twins among the Christian are 66.67% and 33.33% respectively, and these are 80% and 20% respectively, among the non-Christian (Table 14).
19. The expected ratio, according to Weinberg's method, between monozygotic and dyzygotic twins among the Christian (1:1) is similar to that theoretically expected ratio, but it is much higher among the non-Christian (3:1).

Social Correlates (Chapter V):

1. Among the War Khasi (both Christian and non-Christian), the average number of live-births per mother is also found to decrease with the rise in age at marriage (Table 15)
2. Economic condition, based on monthly per capita income of the household, is found to have an inverse effect on fertility rate. The average number of live-births per married woman decreases with the rise in income level, in both the sections of the War Khasi population (Table 16).
3. Among the Christian section, the infant and the juvenile mortality rate have declined gradually with the rise in the level of per capita income of the household. But this trend is not very clearly perceptible

among the non-Christian, in which the high income group experiences a higher infant and juvenile mortality rate than the middle income group (Table 17).

4. It is found that the fertility rate as well as the mortality rate tends to decline gradually with the rise in educational standard of the mother. It holds good for both the sections of the population (Table 17).
5. The effect of religion on fertility and mortality is perceptible, though not very clear in the present study. All analyses of the present date have been carried out on the basis of religion.
6. It is found that marital relation between the Christian and the non-Christian is very low. In the Christian, 3.65% of the marriages with the non-Christian, and in the non-Christian, 7.30% of the marriages with the Christian (Table 18).
7. As far as the present study is concerned, no couple, in either of the two sections, has been found to have adopted any family planning method at any point of time. So in the present study, only natural fertility of the married women has been considered.
8. It is found that the rule of clan exogamy is strictly observed by both the Christian and non-Christian sections of the War Khasi. In the present study, not even a single case has been detected which has deviated from this rule. It may be noted that there

is no clan concept in Christianity, and Christianity arrived in this Khasi land about 150 years ago. So, it seems that tradition dies very hard among the war Khasi.

Genetic Implication (Chapter VI):

1. The mean marital distance among the War Khasi (Christian - 2.30 ± 0.63 Kms. and non-Christian - 1.28 ± 0.35 Kms) is very low in comparison with other Indian populations (Table 20).
2. It is also found that the mean marital distance tends to increase with the rise in income level of the household, and it holds good for both the sections of the War Khasi (Table 20).
3. The distribution of marriage distance in both the sections is leptokurtic and not normal (Table 20a, Figure 3).
4. The marriage between blood relations is very unusual among the War Khasi. Out of 192 marriages among the Christian, one (i.e., 0.52%) case is found to be a marriage between the first cousins, and among the non-Christian, one (i.e. 0.32%) case out of 315 marriages is found to be a marriage between the second cousins, which may be due to very low marital distance.
5. The admixture rate among the War Khasi (Christian - 2.50% and non-Christian - 0.87%) appears to be very low (Table 21).
6. The coefficient of breeding isolation is found to be 3.44 among the Christian, and 1.77 among the non-Christian section of the War Khasi (Table 22).

7. It is found that the effect of drift is very much appreciable in both the sections of the War Khasi population (Table 22).
8. The index of total selection intensity, according to Crow's formula, (Christian - 0.360, non-Christian - 0.446) is more towards the lower half of the national range in both the sections of the population, which indicates that selection pressure in both the sections of the War Khasi is quite moderate (Table 24).
9. According to Johnston and Kensinger's method (1971), the index of opportunity for selection is 0.486 in the Christian and 0.568 in the non-Christian, which shows a greater contribution of mortality towards the total selection intensity.
10. **Village endogamy** is an important aspect of social organisation among the War Khasi. In the present study, out of 192 marriages among the Christian, 15 (i.e. 7.81%) cases are found to be between the villages, whereas among the non-Christian, out of 315 marriages, 18 (i.e. 5.71%) cases are found to be between the villages. So, it seems marriage within the village is a normal practice in both the sections of the War Khasi. In the Christian section, the frequency of marriages within the same village is 92.19% and it is 94.22% among the non-Christian. It shows that the rate of intra-village marriage is slightly higher among the non-Christian, who are more traditional. However, the tendency for intra-village marriage is very much in vogue in

both the sections of the War Khasi, and consequently, it leads to village endogamy (Table 19).

Village endogamy is considered to be determined by a number of socio-economic factors (Ghosh, 1990; Murdock, 1949; Karve and Malhotra, 1968; and others). Das Gupta (1984) says that in the War Khasi, local endogamy is not determined by the environmental knowledge, but by the rule of inheritance. Nakane (1977) says that owing to the prevalence of duolocal residence, visiting marriage must have been a great inconvenience. Her argument is also supported by Das Gupta (1984) and Ghosh (1990). Thus, it seems that village endogamy among the War Khasi is determined by many socio-economic factors. It is a matter of further research for a cultural anthropologist, and it is beyond the scope of the present study.

We have seen that there are low admixture rate, low mean of marital distance and a strong tendency for village endogamy in both the sections of the War Khasi. Besides, the marital relation between Christian and non-Christian is also very low. Each of these phenomena has got certain genetic implications. What effects will they have on genetic structure of these two, apparently endogamous, sections of the War Khasi? It seems that each of the sections of the War Khasi might have already lost or will lose its genetic homogeneity (gradually) and some

sort of micro-heterogeneity might be or will be perceptible between villages in each section of the War Khasi. Consequently, the intensity of evolutionary forces, such as selection, drift, etc., might be or will be of different magnitude for each village in each section of the War Khasi, which might have led or will eventually lead to the formation of several **demes** in each section of the War Khasi. So, it will not be reasonable to consider each section of the present population as an endogamous group or **deme** from a genetic point of view. This contention can only be tested, if in future, a study can be taken up in each village of both the sections of the War Khasi with several genetic markers, such as blood groups, red-cell enzymes, serum protein, etc., with a view to understanding the genetic structure of each village. We hope some further studies will throw much more light on what we have suggested here.

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APPENDIX

Questionnaire

SL.NO. _____ VILLAGE: _____
HOUSE NO. _____ DATE: _____

1. Name of informant (Mr/Mrs.): _____

2. Age _____ Date of birth _____
Age at marriage _____.

3. Place of origin _____
Place of residence _____

4. In case, place of residence is different from place of origin or birth, please specify the following:

Name of village _____ Distance: _____
Cause(s) of migration: _____

5. Tribe _____ Sub-tribe _____
Religion _____

6.(a) Name of husband/wife _____

(b) Age _____ Date of birth _____
Age at marriage: _____

(c) Place of origin _____
Place of residence _____

(d) In case, place of residence is different from place of origin, please specify the following:

Name of village _____ Distance _____
Cause(s) of migration _____

7.(a) Total number of your family members _____

(b) Please specify the following:

Parity	Name	Sex	Pre-sent age	Marital status	Relationship
--------	------	-----	--------------	----------------	--------------

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.

8. (a) Are you your husband's first wife? YES/NO _____

(b) If NO, please specify the following:

Sl. No.	Name of wife with age	Age at marriage		No. of children with age	No. of dead children with age
		Wife	Husband		

9.(a) Is it your first marriage? YES/NO _____

(b) If NO, please specify the following:

9.(a) Is it your first marriage? YES/NO _____

(b) If NO, please specify the following:

SL. NO.	Name of Husband with age	Age at marriage		No. of children with age	No. of dead children with age
		Husband	Wife		

10. Tell me in detail about your pregnancies through your present husband.

(a) Total number of living children: _____

(b) Total number of dead children: _____

(c) Please specify the following according to your pregnancies:

PARITY	NAME	SEX	PRESENT AGE	MARITAL STATUS	IF DEAD, CAUSE OF DEATH WITH AGE	REMARKS
--------	------	-----	-------------	----------------	----------------------------------	---------

- 11.(a) Is there any consanguineous relation with your husband/wife? YES/NO _____
- (b) If YES, please specify whether:
Sister-brother/Uncle-Niece/First Cousin/Second Cousin
OR ANY _____
-
- 12.(a) Is there any physical deformity in any member of your family? YES/NO _____
- (b) If YES, please specify:
13. Your level of education: _____
14. Your husband/wife's level of education _____
- 15.(a) Are you a working woman? YES/NO _____
- (b) If YES, please specify the following:
Place of work _____
Nature of work _____
Duty hours _____ Total Remuneration per month/year _____.
16. Please specify your husband's/wife's work:
- (a) Place of work _____
- (b) Nature of work _____
- (c) Duty hours _____ Total remuneration per month/year _____.
17. Other source of income, if any _____
18. What is the total monthly/annual income of your family? _____.
19. What is the total/monthly annual expenditure of your family? _____.
-
- 20.(a) In your opinion what should be the ideal size of your family? _____.

- (b) How many sons and daughters? _____
- (c) Do you have any preference to female child over male child? YES/NO _____
- (d) If Yes, please give the reasons in order of preference.
- (e) If No, why
- 21.(a) Are you aware of family planning method(s)? YES/NO _____.
- (b) If YES, please tell your attitude towards family planning:
 Positive/Negative _____
 Reasons _____

- (c) Are family planning advices readily available to you? YES/NO _____
- (d) If YES, please specify the source _____
- (e) Whom do you generally consult for any family planning advice?

- (f) Is family planning necessary for the welfare of your family? YES/NO _____.
- (g) If YES, why?
- (h) If NO, why?
- 22.(a) Do/Did you or your husband adopt any family planning measure(s)? YES/NO _____.
- (b) If YES, please specify:
 Nature of contraceptive _____
 Duration of use _____

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Reason(s) for discontinuation, if any _____

(c) If NO, why ? _____

23. REMARKS:

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