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, Wahum-mlein 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 $20.04 \pm 0.32$ years and in the non-Christian $19.44 \pm 0.25$ 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 \pm 0.23 in the Christian and 3.75 \pm 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 homegeneity (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.