CHAPTER - JII

C O N C L U D I N G O B S E R V A T I O N S

GENERAL

The Gujarat coastline comprising the northern part of the West Coast of India may not in terms of macro-level observations reveal the complex intricacies of the various coastline processes which are inturn, control the coastal environments, but when it is examined in detail, a very precise picture of the micro-environmental concitions prevailing in the different parts of the coastline and their reflections in the well defined distinct foraminiferal assemblages emerges out. Thus, the nature of the variation in the coastal microfauna preserved within the beach deposits and the tidal muds of the

study area reflects the environmental diversity that prevails along the coastline of Gujarat. It is quite interesting to observe the effects of the variations of physical and chemical ecological parameters that are not only reflected in the faunal populations but also in the size of the tests.

A critical account of the microfaunal variations provides a good insight into the important environmental parameters as prevailing along the coastline. It should however be noted that the conclusions beyond a certain point have to be taken as arbitrary and preliminary, because studies, having been based on the present day accumulations of the beach and mud between the intertidal zone that consist of a combination of both indigenous and non-indigenous populations. What one finds to-day along the coast is an odd mixture of sediments with foraminiferal tests showing fairly wide ranges of variations in space and time. What the present author has examined could belong to more recent as well as somewhat ancient (of course Holocene) animal remains; also they might be representing organisms transported several kilometers from offshore and alongshore parts by wave currents, surf and littoral drifts. But keeping in view the fact that the coastline behaviour for the last few thousand years has been more or less the same, the author has attempted to prepare a Holocene coastline model on the basis of the microfaunal characteristics. She has also attempted to present a bird's eye view of the factors that have controlled the diversity of the foraminifera and their modes of occurrence.

SYNOPTIC VIEW OF THE FORAMINIFERAL DIVERSITY

The number of species for the dominant genera vary from one to ten, each. In a general way however, it can be stated that two to three species for each genus are present or dominate over others. The following account summarizes the pattern of species variation along the coastline:-

Ammonia - Three species of this genus are recorded. Ammonia dentatum and Ammonia annectens are dominant in open coastal environment, whereas Ammonia beccarii characterise an environment that is transitional.

Amphistegina - Three species of Amphistegina are recorded of which Amphistegina radiatus is the most common.

Bolivina - Bolivina is represented by five species.

Bulimina - Three species of Bulimina have been encountered, of which Bulimina marginata and B.gibba are common.

Elphidium - Nine species of Elphidium constitute the Elphidium fauna. Of these, Elphidium crispum with megalospheri and microspheric forms and their different variants are quite common.

Cibicides - Eight species of Cibicides constitute the Cibicides fauna. The more common are Cibicides reflugens and Pseudoungeriana.

Nonian - Five species of Nonian are present. Nonian boueanum and nonianscapha constitute the major part of the population.

Eponides - Eponides is represented by only one species i.e. Eponides repandus. But Poreponides lateralis with its variants is quite common, mostly along the southern Mainland coast.

Pararotalia - Only three species of Pararotalia occur, out of which Pararotalia baltovskoy and Rotalia calcar ... cominate.

Discorbis - This genus is represented by only one species i.e. Discorbia globularis.

Cancris - It is represented by only two species - Cancris oblonga and C. auricula.

Lagena - Four species of Lagena are common, mainly along the Mainland coast, viz. Lagena semi-striata, L. anterrupta, L. globosa and L.laevis.

Siphogenerina - This genus is represented by Siphogenerina raphanus with megalosperic and microspheric form.

Quinqueloculina - Nine species of Quinqueloculina occur in the study area. The most common are Quinqueloculina seminulum and Q. lamarckiana.

Triloculina - Four species represent the Triloculina fauna. Out of these Triloculina tricarinata is commonly found.

Spiroloculina - Spiroloculina is represented by five species of these Spiroloculina depressa and Santillatrum with their variants are most common.

Pyrgo - Only two species of this genus occur of which Pseudopyrgo milletti is common.

Globigerina - The planktonic foraminiferal population is represented by three species i.e. Globigerina glutinata. G. quinqueloba and G. bulloides.

The relative abundance or otherwise of certain foraminifers, size, fragility or robustness of the tests and the degree of abrasion and damage, all these characteristics when viewed

together, provide a revealing picture of the coastline environments.

The accompanying diagram (Fig. VII-1) shows a synoptic picture of the foraminiferal variation in the various coastal segments, and ideally illustrates the behaviour of the four dominant genera and their mutual relationship in the different types of coastal environments. As it has been amply discussed in the earlier chapters, the various ecological factors, physical as well as chemical, have also affected the "health and well being of the tests" and in the Table VII-1, these aspects have been highlighted.

GENERALISED ECOLOGICAL PICTURE

The variations in the micrcfaunal distribution as shown by the different segments of the ccastline, point to a significant control exercised by the diverse combinations of the various offshore and littoral processes. This fact has been adequately brought out in the correlation observed to exist between the foraminifer population and the environmental parameters, salient feature of which have been discussed in the Table VII.2 :-

CONCLUDING REMARKS

The variations in the ecological conditions depend considerably on the numerous geological, geomorphological and meteorological factors. A fault-controlled coastline configuration, the nature of the substrate and the continental shelf (especially of nearoffshore portions) and the factors of neotectonism and eustatic sea-level changes have played a significant role in controlling the coastal environments of the various segments. To a considerable extent, the geology of the coastal plains as well as that of the hinterland and the gradient of the rivers have added another dimension to the coastline environmental diversity.

The varying intensities of tidal currents, the fluctuating energy conditions related to wave actions are seen considerably influenced by the direction and intensity of winds. This phenomenon of the complex interplay of various sub-surface and subaerial processes of nature has no doubt, imparted a fascinating panorama of coastline characterized by a variety of environments. And this variety is adequately reflected in the coastal microfauna. In this thesis the author has made an attempt to work cut the microfaunal diversity in relation to the varying ecological controls. She must however, admit that the present study certainly does not provide answers to all questions; it only marks a beginning, and perhaps raises many more questions for which, more detailed and in- depth future studies may provide the answers.