CHAPTER IX

CONCLUSION
The aim of the present study was to study the prevalent diseases in the light of geographical factors, i.e. in terms of the environment in which people live; and also in terms of their dietary habits - in other words, of their nutritional status. The natural and cultural environment in which people live forms the most important aspect in the geographical study of diseases, but this has always been neglected by the medical profession.

The factors which affect the incidence and distribution of diseases can be broadly grouped into two types: i) The Constant or Permanent Factors, and ii) The Changing or Temporary Factors. These may be initially discussed, before other concerned points of the subject of this study can be considered.

**CONSTANT FACTORS**: These include Physical Features, Geology, Climate, Soils and Natural Vegetation. Of these, geology
largely determines soil conditions, while agriculture very largely depends on the latter. However, as far as the present study is concerned, climate is the most important factor; the effects, both direct and indirect, of this factor have already been discussed in detail elsewhere. Natural vegetation as such has no ill-effects. On the other hand, soil is important both in its direct and indirect effects. Further, soil is both a constant as well as a changing factor in the sense that the production of foodstuffs can be increased by application of irrigation and fertilizers. More nutritious food can also thus be obtained.

Of the various environmental factors determining the incidence of diseases in the region and noticed by the author during field work, air is one. An inexhaustible source of disease, when humid, air contains mycelial spores which when breathed in could cause diseases of epidemic nature. Air also transports spores from one place to another and creates new foci of infection.

Another environmental vector of diseases is water, which, when contaminated, could cause diseases like typhoid, cholera, dysentery and other digestive disorders.

CHANGING FACTORS: Here, Man himself is a factor. Various aspects of population include density, sex-ratio and literacy; while, several cultural characteristics like religious
traditions are equally important. Man's occupation and settlement features, ways of living, facilities like drinking-water supply, sanitation and drainage should also be considered. All these factors change with time, particularly with increasing industrialization and urbanization.

All these factors, which have been dealt with in details in the earlier chapters, are not only inter-related among themselves, but are related to the food habits of the people concerned. The different crops that are grown here, the fruits and vegetables cultivated - these determine the food habits. Thus wheat and jowar which are the main crops grown here and also pulses, oilseeds and rice as well as fruits - which are rather unimportant - all play a part in determining the dietary patterns of the people.

Agricultural production is, however, hampered by the problem of water shortage. Water is inadequate and seasonal. The cost of fertilizers is high and so the poor farmers cannot afford them; on the other hand, use of cheaper methods such as composting, night soil green manuring etc. requires further education of the masses. Industries often provide opportunities for raising standard of nutrition. For instance, the BHEL township is a well-equipped centre with all the modern facilities. However, even here, amongst the labour classes, conditions become suitable for the occurrence of various diseases; of course, due to greater availability of proper
medical facilities, diseases cannot spread here so widely as in the rural areas.

The most important industry in the study region, however, is the bidi-making industry, which is found in many places. In this industry each and every member of the household can participate and thus raise the earning power of the family but it also creates an unhygienic and polluted environment. It also reduces the alertness of the people by which resistance power is influenced. Besides other complications, tuberculosis emerges widely, when someone is engaged in this industry, due to the ill-effects of the materials used in the preparation of bidis.

MODES OF LIFE: To a certain extent, modes of life also determine the disease incidence. Broadly two types of modes of life are found in the region:

1) Rural, 2) Urban.

About 78.4 per cent of the people live in villages so that the rural environment is predominant and is one of the most important deciding factors in the pattern of disease incidence. Usually rural people obey religious traditions of their own community. Ignorance, poverty, backwardness and lack of civic sense are usually found in the rural environment. On the streets of the villages, cow-dung and even night-soil, spittle, kitchen rubbish and domestic used water can be seen
easily which makes the conditions pretty bad.

In many places it has been observed that all the dirt, including human excreta, is allowed to pollute the waters of a near-by tank or river, which give rise to many disease-organisms. It has been seen commonly that in villages almost every house has its pit near the house in which all domestic water is allowed to accumulate, which also favours many disease-organisms to grow. Due to lack of sanitation, the general conditions of the villages cannot be said to be quite hygienic. Their houses are also ill-built, in which ventilation is not proper.

Mostly all urban centres of the study unit are in the developing stage and most of the residents of these towns have only recently migrated from rural places, so basically they are rural, i.e. their habits, ways of life etc. have not much changed. But sanitation, medical facilities, housing and drinking water facilities are better than in rural places. In some places inadequate sanitation and drinking-water facilities, and over-crowding could also be noticed. Lack of uncontaminated drinking water and solid waste disposal facilities is a common problem in most of the towns of the region.

As far as life is concerned, human excreta and refuse of all kinds are here also seen on the streets, which helps flies, mosquitoes, rodents and other disease-producing agents to thrive. Water sources are usually polluted and industrial
fumes, coal-waste products and domestic used material including water make the environment dirty in many parts of the towns. Unemployment, poverty, congestion and frustration also make the persons weak and reduce their resistance power. The condition of houses is better here, but over-crowding and lack of underground drainage favour epidemic diseases in the towns.

MIXED AND DISEASES

FOOD HABITS

Food is the chief source of nourishment for the body and it plays a fundamental role in the struggle for existence. It has, therefore, acquired a great significance in human society.

Food habits of the people vary from culture to culture. What people are willing to eat is determined by a complex system of attitudes, ideas and assumptions that form the local culture, including religious restrictions, taboos and ideas pertaining to the merits and demerits of foods and past practices. Food habits are, therefore, the product of the people's present environment and past history. These two factors also determine the meal pattern and methods of eating.

The food habits of the people living in the study area have been governed largely by local production and prevailing customs and traditions. Most of them are basically
vegetarian in their food habits. Cereals like wheat, jowar, rice and maize have a dominant place in their diet. Vegetables are consumed to an extent depending upon local availability. Fruits are only occasionally eaten, this varying according to economic condition of the family concerned. Milk is consumed only in the form of beverages; while meat, fish and eggs are, at least in the rural areas, rarely consumed amongst several communities.

FOOD AND NUTRITION

Good health and a body free from diseases depend on an adequate and balanced diet. However, the diets commonly adopted in the study region are inadequate, both as regard calories as well as nutrients. Between rural and urban diets, the former are comparatively better in regard to calories. Among the nutrients, proteins, vitamins A and B₂ and calcium are particularly deficient in the diets of both urban and rural areas. The extent of deficiency varies primarily according to community and also according to cooking methods, economic condition and availability. Rural families are generally vegetarian, while in urban families both types of habits are seen. In urban families monthly income is the main controlling factor as far as quality and structure of the diet are concerned. Another fact which has been noticed in the study region is that all members of a family get the same diet; different diets are not given to the different
members. However, male members generally receive more attention in comparison to the female members.

DIET AND DISEASES

The relation between diet and disease pattern is now well established. The basic and widespread protein-calorie malnutrition (PCM) is undoubtedly the most important diet-based problem in the study area, resulting in several diseases, specially among children. Both environmental and deficiency diseases have been widely noticed by the author during his field work, but particular mention may be made of dysentery, typhoid fever, tuberculosis, whooping cough, anaemia, night-blindness, retarded growth, bone deformities, a certain eye condition, dental caries, gastritis, liver diseases, skin diseases and certain respiratory troubles. The author, on the basis of his personal observation, could almost definitely say that, in the incidence of these diseases the prevailing dietary patterns have played an important part. Due to poor nutritional status and the indifferent physiological condition of the mother, the health and the growth of children are found wanting. Nutritional disorders do not arise when there is ample food production and the people possess knowledge regarding the best use of available foods and no section of community is prevented by poverty from obtaining a good diet.
MEDICAL FACILITIES

Medical facilities are the key point by which ill-health and the spread of diseases could be controlled. Medical facilities available in a region gives the real picture of its good or bad health, since, with proper medical facilities available, but few diseases would occur. As medical and sanitation facilities improve, people become less susceptible to various diseases.

Table 9.1
DISTRICT-WISE MEDICAL FACILITIES, 1970 (Plate No. 12)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>District</th>
<th>Total No. of Hospitals</th>
<th>Total No. of Beds</th>
<th>Other special Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sagar</td>
<td>17</td>
<td>198</td>
<td>Anti-Rabic, Eye Clinics, T.B. Clinics, Eye hospital in Khural (private).</td>
</tr>
<tr>
<td>2</td>
<td>Guna</td>
<td>17</td>
<td>205</td>
<td>T.B. Clinics and Anti-Rabic.</td>
</tr>
<tr>
<td>3</td>
<td>Vidisha</td>
<td>14</td>
<td>186</td>
<td>T.B. Clinics and Anti-Rabic.</td>
</tr>
<tr>
<td>4</td>
<td>Raisen</td>
<td>52</td>
<td>132</td>
<td>Anti-Rabic.</td>
</tr>
<tr>
<td>5</td>
<td>Bhopal-Sehore</td>
<td>67</td>
<td>1448</td>
<td>Cancer, Cardiac, Leprosy, T.B. Hospital, Eye Clinics with other specialised facilities for other disorders.</td>
</tr>
</tbody>
</table>

Source: Directory of Specialised Treatment Centres, Director of Health Services, Madhya Pradesh, Bhopal, 1970.
EASTERN MALWA PLATEAU

MEDICAL FACILITIES

- P.H.C. HQ
- DISTRICT HOSPITAL
- SUB-CENTRE
- DISPENSARY
- CANCER CENTRE
- DENTAL CLINIC
- CARDIAC CLINIC
- EYE CLINIC
- BLOOD BANK
- TUBERCULOSIS SANATORIUM

Figures indicate the number of hospital (where known).

There are no great differences in the number of beds available, except that in Bhopal-Sehore, there is a Medical College and there are also certain other hospitals with specialised treatment facilities.

SPECIAL TREATMENT FACILITIES

CANCER: On the basis of data collected from the study unit, it can be said that cancer incidence is now increasing. As far as cancer treatment facilities are concerned, within the area under study, the Hamidia Hospital, Bhopal, where deep X-ray therapy facilities are also available, is the only centre. Besides this, in Bhopal proper some private clinics also have some facilities.

CARDIAC: Hamidia Hospital, Bhopal is a well-equipped centre for cardiac treatment. Besides this, certain private clinics of the region, particularly in district places have also some specialised treatment facilities. District civil hospitals of the area under study have also some facilities of this type.

EYE: As far as government facilities are concerned, Hamidia Hospital, Bhopal has well-equipped facilities for eye treatment. Beside this, Khurai has a National (General) Hospital for eye treatment. District civil hospitals now have facilities for eye troubles.

LEPROSY AND ANTI-RABIC: Facilities for treatment of leprosy and rabies are available in some district hospitals and/or P.H.Cs of the region under study.
TUBERCULOSIS: Tuberculosis treatment facilities are available in Bhopal, Vidisha, Sagar and Guna hospitals.

Besides the above, in Bhopal there are some well-established private centres for treatment of certain diseases. In district hospitals also many specialists are now available for special treatment.

On the basis of the above-given description, the existing medical facilities in the region (except in Bhopal) can be termed as quite poor in terms of minimum requirements. The main problem that the region faces on the medical front is the lack of facilities in the rural areas. Specialist doctors are also not ready to go to the village-side. The ultimate solution is to develop our villages economically as well as socially. It is true that the solution requires bigger efforts, and whether we can achieve this solution, only the future can answer.

SUGGESTIONS: For the eradication of many diseases the following points may be considered:

1. Improvement of uncontaminated drinking-water facilities.
2. Protection of sources of water from pollutants.
3. Improvement of sanitation in the region.
4. Provision of internal drainage.
5. Improvement of solid waste disposal facilities.
6. Improvement of educational facilities.
CONCLUSION

FOOD FOR THE FUTURE

The first problem would be to raise agricultural production to meet the demands of the increasing population. There are certain possibilities by which we could increase agricultural production, viz.:

i) By increasing the sown area

ii) By extending the area under irrigation, so that double or even treble cropping could be possible

iii) By avoiding wastage

iv) By increasing the use of fertilizers and by adopting improved techniques of cultivation.

It is very essential to provide extensive irrigation facilities in the region, to enable the farmers to grow more than one crop and encourage the cultivator to plan for avoidance of wastage resulting from faulty storage and irrational food habits.

The net sown area in the study region forms 48.2 per cent of the total area while the area under food crops is 62.5 per cent of the net sown area, fruits are sown on only 1 per cent of the sown area.

The yield of different food crops could be increased by providing certain facilities. Pulses which are the main source of protein are the dry crops which are not very responsive to fertilizer treatment so that more area can also be brought under them. The production of protective foods like vegetables, fruits
and animal products cannot be so easily increased as that of cereals and pulses.

ANIMAL RESOURCES: The total output of milk in the region under study is satisfactory up to a certain extent. The same is the case with eggs, but there are many traditional barriers in the adoption of poultry as a source of protein, so that the more important source of protein is really milk because it is acceptable to every section of the population. But due to improper maintenance of animals the output of milk per cow or buffalo is poor, it is also due to the poor quality of cattle; further the supply of fodder and management techniques are primitive. The immediate objective should be that the cattle production be not allowed to rise further.

FOOD WASTAGE AND LOSS: It is estimated that one-fifth of the total food produced in the country is lost in handling, storage, cooking and usage. The system of packing and storage is not proper. A large quantity of our food is eaten by rats and insects. In the study region cooking is according to taste and over-cooking and frying are common, which gives a tastier food but results in a low nutritive value. Yet another aspect concerned with the food is adulteration, by which foods lose their nutritive value.

It may be noted that the economy of the region is dominated by agriculture, while on the other hand, agricultural production, availability of food, dietary habits, resistance power and incidence of diseases are all linked together. As a whole it may be said that production of different crops is not satisfactory mainly due to poverty and backwardness.

FACTORS OF POLLUTED ENVIRONMENT

Environment is the combination of various circumstances in which man lives and the resultant diseases have a close relation with the environment.

WATER-SUPPLY: Adequate uncontaminated water-supply is very essential for every individual as well as for all activities of the human society. Diseases like typhoid, dysentery and other digestive troubles are transmitted through water. As far as the area under study is concerned, most of the population does not enjoy piped water-supply, due to the fact that only nine urban centres out of twenty-one, have this facility. Human waste is the most important source of water pollution, which carries disease producing organisms.

POLLUTION: Pollution is that which helps in the deterioration of the environment. When man-made material becomes harmful to the human being then it is termed as Pollutant. Widespread forms of pollution originate from the contamination of food, water-supply, waste-disposal, pathogenic organisms, noise, air etc.
Every year millions of people fall victim to a variety of communicable diseases, due to the combined effects of polluted environment, in which people live. Social factors may also make the environment favourable for the emergence of many diseases and all these can be prevented through efficient environmental control, i.e. through adequate water-supply, maintenance of community sanitation and provision of adequate waste disposal facilities.

So far as the area under study is concerned, many people suffer from the combined effects of ignorance, poverty, poor food and diseases. The majority of the people use contaminated water for drinking and washing and also have no proper facilities for disposal of waste materials. Poor drainage has been reported throughout the study region, which plays an important role in the prevalence of many diseases.

The towns of the region are particularly exposed to the combined effects of slums, insanitation and air and water pollution.

Air pollution in the rural areas is negligible and is experienced only in the city centres where carbon monoxide and the volatile hydrocarbons are the main polluting agents of the atmosphere.

Since a majority of the population of the study region does not have adequate piped water-supply, people seek water
from unprotected sources where biological pollution is allowed to reach. In wells and tanks also, pollution take place through washing and bathing of both man and animals. Waste materials can be easily seen near and around the sources, which create a favourable environment for the survival of disease-producing agents.

WASTE DISPOSAL: Sanitary sewage and waste disposal are today's important problem. Refuse of all kinds helps flies, mosquitoes, rodents and other disease agents to thrive, passing on illness to man. Main health hazards have been introduced into many communities, due to inadequate waste-disposal facilities. Improvement in this regard is quite essential to safeguard community health. Quite often, in the entire region any one could easily notice, even on the main streets, waste materials including human excreta and cow-dung. The habit of throwing waste material has been seen to be quite common in the entire region.

The problem of disposal of waste is more serious in the rural areas where facilities are not proper. All kinds of wastes accumulate near the house or source of water, forming an unhygienic environment. Various respiratory diseases, skin diseases, and communicable diseases spread due to faulty practices of disposal of waste.

PERSONAL POLLUTION: Smoking and tobacco habits have been reported throughout the region and are responsible for various
respiratory troubles. Drinking habits are also now being found increasingly in the entire region and people usually take to this habit as a sign of modernity. People are also found engaged in certain unnatural habits; this is found in developing stage. In the interest of the well-being of the society, it is desirable to take immediate steps for the control of all these habits.

IGNORANCE AND POVERTY: Ignorance and poverty are interconnected with each other, but ignorance is responsible for the poverty of the region. Literacy is quite poor, particularly among women of the area under study. Old traditions, false beliefs and faulty cooking methods which were noticed by the author quite commonly in the region are only due to these factors.

SANITATION: As far as communicable diseases are concerned, these can easily be eradicated by providing good sanitation facilities, but in the area under study, such facilities even in towns are not adequate, which is essential for the well-being of human society.

CONCLUSION

To summarise the observations made by the author in the course of his field study, the following environmental and human points may be mentioned as being responsible for the prevalence of diseases in the region under study.
i) Ill-built houses, lack of ventilation and insufficient space: At many places it may be noticed that houses are built in insanitary surroundings, and thus people are not able to use natural light.

ii) Unpurified and contaminated waters: Even though tap water is often available, it is not always sufficient, so that people seek contaminated water and from other sources, or store reserve water often in insanitary containers. Pollution of water has been seen even at the places where people seek water. Also at many places, the main pipe runs near the sewer line or a latrine which increases the possibilities of contamination.

iii) Problem of solid waste disposal: The manner of waste disposal is also not satisfactory. At many places the author has noticed that handling and transportation of wastes is being done by human contact so that the insanitary disposal of human wastes increases the possibilities for widespread transmission of diseases.

iv) Lack of drainage for domestic used water: The lack of a proper drainage system for domestic water also creates insanitary surroundings.

v) Air, noise and personal pollution: The number of motor vehicles in several of the towns is considerable so that various fumes such as carbon
monoxide, air-borne particles, volatile hydrocarbons etc. are always being added to the atmosphere.

vi) Unhygienic living conditions.

vii) Crowded atmosphere.

viii) Poverty (poor socio-economic condition).

ix) Lack of civic sense: At many places the author has himself seen the refuse materials dumped even on the main streets, as well as other signs of a lack of civic sense.

x) False beliefs: It has also been noticed particularly in rural places that the treatment system adopted is very much influenced by the prevalent religious beliefs. According to rural people, most of the diseases are due to the imbalance of supernatural forces and worship is regarded as the only remedy.

xi) Personal dirty habits.

xii) Low educational level, particularly amongst women.

xiii) Frustration, stress and strain: During field work, the author noticed that most of the people of the region under study were frustrated due to one cause or the other.

xiv) Poor dietary habits and lack of knowledge of nutrition.
xv) Faulty cooking methods.

xvi) Adulterated eatable stuffs, and a faulty purchase system.

In view of the existing disease pattern, it is quite essential to take immediate steps to provide facilities for adequate water-supply, sanitary disposal of wastes and proper housing and community sanitation; per capita income, standard of living, dietary intake and personal habits should also be improved.

It has been made clear in earlier Chapters that some diseases bear a very close relationship to environmental conditions of the areas under study, while on the other hand deficiency diseases have a very close relationship with the prevalent dietary patterns. Malnutrition is mainly responsible for the occurrence of many deficiency diseases; it also determines the resistance power of the body against diseases.

Studies of correlation of the distribution of diseases with the natural and the cultural environmental factors and prevalent dietary pattern with social background are indispensable in the present context. These include nutritional status of the people, environment and living condition, over-crowding, socio-economic status, drinking water, ignorance, lack of medical facilities, carelessness, personal habits, prevalent religious beliefs and treatment
concept; all these have determined the occurrence of diseases in the geomedical unit under study.

SCOPE FOR FURTHER RESEARCH

It is evident from the enquiries conducted by the author during the course of this work and from the discussions made in the above-mentioned pages, that further research is indicated along the following lines:

1) Any one aspect of the environment and disease occurrence.

2) Any one disease and environmental factors.

3) Nutritional deficiency and diseases, particularly deficiency of one nutrient leading to a particular disease.

4) Identification and analysis of what may be termed as 'the micro-environmental factors', which affect health and diseases.