

E. coli diarrhoea, Non-cholera vibrio illness, *V. parahaemolyticus* infection, Streptococcal infection, Shigellosis
Brucellosis
Viral hepatitis, Gastroenteritis
Taeniasis Hydatidosis, Trichinosis, Ascariasis, Amoebiasis, Oxyuriasis

- (2) Viral diseases
- (3) Parasites

FOOD TOXICANTS

1. Neurolathyrism

The cause of neurolathyrism is a toxin, Beta oxalyl amino alanine (BOAA) which is found in the seeds of the pulse, *L. sativus* (Khesari dhal). Neurolathyrism is a public health problem in certain parts of the country where this pulse is eaten (see page 644).

2. Aflatoxins (155, 156)

Aflatoxins are a group of mycotoxins produced by certain fungi, *Aspergillus flavus* and *A. parasiticus*. These fungi infest foodgrains such as groundnut, maize, parboiled rice, sorghum, wheat, rice, cotton seed and tapioca under conditions of improper storage, and produce aflatoxins of which B₁ and G₁ are the most potent hepatotoxins, in addition to being carcinogenic. The most important factors affecting the formation of the toxin are moisture and temperature. Moisture levels above 16 per cent and temperatures ranging from 11 to 37°C favour toxin formation. Aflatoxicosis is quite a public health problem in India. The latest report (1975) of 400 cases of aflatoxin poisoning including 100 deaths from Banswada and Panchmahal districts of Rajasthan and Gujarat respectively highlight the problem in India. Aflatoxin B₁ has also been detected in samples of breast milk and urine collected from children suffering from infantile cirrhosis. Attempts are also being made to relate aflatoxin with human liver cirrhosis.

Control and preventive measures : A crucial factor in the prevention of fungal contamination of foodgrains is to ensure their proper storage after drying, Moisture content should be kept below 10 per cent. If the food is contaminated, it must not be consumed. It is also essential to educate the local population on the health hazards of consuming contaminated foodgrains.

3. Ergot (157, 158)

Unlike *Aspergillus*, ergot is not a storage fungus, but a field fungus. Foodgrains such as bajra, rye, sorghum, and wheat have a tendency to get infested during the flowering stages by the ergot fungus (*Claviceps purpurea*). Fungus grows as a blackish mass and the seeds become black and irregular and are harvested along with food grains. Consumption of ergot infested grain leads to ergotism. Sporadic outbreaks of ergot poisoning in human population have been reported from time to time in areas where bajra is consumed as a staple. The symptoms are acute but rarely

fatal and include nausea, repeated vomiting, giddiness and drowsiness extending sometimes for periods upto 24 to 48 hours after the ingestion of ergoty grain. In chronic cases, painful cramps in limbs and peripheral gangrene due to vasoconstriction of capillaries have been reported. However, the long-term effects of consuming small amounts of the toxin are not known. A disquieting feature is that the recently introduced high-yielding varieties of bajra are more susceptible to infestation. Ergot-infested grains can be easily removed by floating them in 20 per cent salt water. They can also be removed by hand-picking or air floatation. The upper safe limit for the ergot alkaloids has been estimated to be 0.05 mg per 100 grams of the food material.

4. Epidemic dropsy (159, 144)

From time to time, outbreaks of "epidemic dropsy" are reported in India. The cause of epidemic dropsy was not known until 1926, when Sarkar ascribed it to the contamination of mustard oil with argemone oil. Lal and Roy (1937) and Chopra et al., (1939) gave experimental proof of the cause of epidemic dropsy. Mukherji et al., (1941) isolated a toxic alkaloid, *sanguinarine* from argemone oil and found out its chemical formula. This toxic substance interferes with the oxidation of pyruvic acid which accumulates in the blood.

The symptoms of epidemic dropsy consist of sudden, non-inflammatory, bilateral swelling of legs, often associated with diarrhoea. Dyspnea, cardiac failure and death may follow. Some patients may develop glaucoma. The disease may occur at all ages except breast-fed infants. The mortality varies from 5-50 per cent.

The contamination of mustard or other oils with argemone oil may be accidental or deliberate. Seeds of *Argemone mexicana* (prickly poppy) closely resemble mustard seeds. The plant grows wild in India. It has prickly leaves and bright yellow flowers. Crops of mustard are gathered during March, and during this period, the seeds of argemone also mature and are likely to be harvested along with mustard seeds. Sometimes unscrupulous dealers mix argemone oil with mustard or other oils.

Argemone oil is orange in colour with an acrid odour. The following tests may be applied for the detection of argemone oil: (1) *Nitric acid test*: A simple test is to add nitric acid to the sample of oil in a test tube. The tube is shaken and the development of a brown to orange-red colour shows the presence of argemone oil. The nitric acid test is positive only when the level of argemone oil is about 0.25 per cent (160). (2) *Paper chromatography test*: This is the most sensitive test yet devised. It can detect argemone oil up to 0.0001 per cent in all edible oils and fats.

The accidental contamination of mustard seeds can be prevented at the source by removing the argemone weeds growing among oil-seed crops. Unscrupulous dealers may be dealt with by the strict enforcement of the Prevention of Food Adulteration Act.

5. Endemic ascites (161, 162)

In Kusmi Block of Sarguja district in Madhya Pradesh

Studies conducted by the National Institute of Nutrition, Hyderabad showed that the local population subsists on millet *Panicum miliare* (known locally as Gondhli) which is contaminated with weed seeds of *Crotalaria* (locally known as *Jhunjhunia*). On chemical analysis, *Jhunjhunia* seeds were found to contain pyrrolizidine alkaloids and hepatotoxins.

The preventive measures comprise educating the population in the affected areas about the disease, deweeding the fields of *Jhunjhunia* plants which grow along with the millet. A simple sieving of the millet at the household level can remove the seeds of *Jhunjhunia* which are considerably larger than those of the millet.

6. Fusarium toxins (163)

Fusarium species of field fungi are known to contaminate food crops and pose health hazards to livestock. The problem of fusarium contamination of food crops is believed to be on the increase. Rice is also known to be a good substrate for fusarium. Work is now in progress at the National Institute of Nutrition to isolate, and identify the toxic metabolites produced by *fusarium incarnum*.

Food additives

The concept of adding "non-food" substances to food products is not new. Pickling is an ancient method aimed at preserving food articles such as mangoes for fairly long periods by the addition of salt. Modern science of food technology has revolutionized food processing with the introduction of chemical preservatives to increase the shelf-life of food, improve its texture or change its texture or colour. Majority of the processed foods such as bread, biscuits, cakes, sweets, confectioneries, jellies, soft drinks, ice creams, ketchup, etc. contain food additives.

Food additives are defined as non-nutritive substances which are added intentionally to food, in small quantity, to improve its appearance, flavour, stability and storage properties (164). This definition also includes food adjuncts which may result in residues in food and components of packing materials which may get mixed into food (165).

Food additives may be classified into two categories. Additives of the **first category** include preservatives (e.g., saffron, turmeric), flavouring agents (e.g., essence), sweeteners (e.g., saccharin), antioxidants (e.g., sorbic acid, sodium benzoate), acidity regulators (e.g., citric acid, acetic acid), etc (166). Additives of the **second category** are, strictly speaking, not food additives but are incidental through packing, processing or other environmental practices (insecticides) or other environmental factors (167). Uncontrolled or indiscriminate use of these additives may pose health hazards among consumers. Certain preservatives such as nitrites and nitrates used in the production of toxic substances, e.g., aflatoxins, have been implicated in cancer aetiology.

be with the international level, in 1963, a
joint FAO/WHO programme on food standards was
established, with the FAO/WHO Codex Alimentarius
Commission as its principal organ. Protection of the health
of consumers is the primary aim of the Commission. The
ultimate effects of food additives on man is an important
problem of public health and is therefore of great concern to
the public and the health administrators.

Food fortification

Fortification of food is a public health measure aimed at reinforcing the usual dietary intake of nutrients with additional supplies to prevent/control some nutritional disorders. WHO (1) has defined "food fortification" as "the process whereby nutrients are added to foods (in relatively small quantities) to maintain or improve the quality of the diet of a group, a community, or a population."

Programmes of demonstrated effectiveness of fortification of food or water are : fluoridation of water as a preventive of dental caries; iodization of salt for combating the problem of endemic goitre, and food fortification (e.g., vanaspati, milk) with vitamins A and D. Technology has also been developed for the twin fortification of salt with iodine and iron.

In order to qualify as suitable for fortification, the vehicle and the nutrient must fulfil certain criteria (25) :

- (a) the vehicle fortified must be consumed consistently as part of the regular daily diet by the relevant sections of the population or total population;
- (b) the amount of nutrient added must provide an effective supplement for low consumers of the vehicle, without contributing a hazardous excess to high consumers;
- (c) the addition of the nutrient should not cause it to undergo any noticeable change in taste, smell, and ... of the

Food materials
Cereals and wheat
Dals
Haldi (Turmeric)
Dhania
Black pepper
Chilli
Tea
Coffee
Asafoetida
Mustard
Edible oils
Butter
Ice cream
Sweets
Fruit
Milk
Cocoa

TABLE 38

Adulteration of foods

Food material	Common adulterants
Cereals such as wheat, rice	Mud, grits, soapstone bits
Dals	Coal-tar dyes, khesari dal
Haldi (Turmeric) powder	Lead chromate powder
Dhania powder	Starch, cow dung or horse dung powder
Black pepper	Dried seeds of papaya
Chilli powder	Saw dust, brick powder
Tea dust/leaves	Blackgram husk, tamarind seeds powder, saw dust, used tea dust
Coffee powder	Date husk, tamarind husk, Chicory,
Asafoetida (Hing)	Sand, grit, resins, gums
Mustard seeds	Seeds of prickly poppy-Argemone
Edible oils	Mineral oils, argemone oil
Butter	Starch, animal fat.
Ice-cream	Cellulose, starch, non-permitted colours
Sweetmeats	Non-permitted colours.
Fresh green peas in packing	Green dye
Milk	Extraction of fat, addition of starch and water
Ghee	Vanaspati

Source : (168)

Prevention of Food Adulteration Act, 1954

Enacted by the Indian Parliament in 1954, with the objective of ensuring pure and wholesome food to the consumers and to protect them from fraudulent and deceptive trade practices, the Prevention of Food Adulteration (PFA) Act was amended in 1964, 1976 and 1984 to make the Act more stringent. A minimum

understanding problems such as the social component of health and disease, "illness behaviour" of people, efficient use of medical care and the study of medical institutions. A brief sketch of the current interest of these disciplines in social science is given below :

✓ 1. COMMUNITY HEALTH

Community health workers are often faced with the problem of why people who need a particular service are least likely to use it or fail to secure the total benefit which is expected. A case in point is immunization against communicable diseases. Although, there is a wide range of prophylactic vaccines, immunization has not gained universal acceptance. The family planning programme in India is a recent example of a health service of which people are not making use to the extent desired. Similarly, health programmes relating to mother and child health care services, improvement of water supplies, installation of sanitary latrines, improvement of dietary patterns and infant rearing practices have all proved abortive or only partially successful. The resistance of the people is felt not only in the field of community health, but in fact even in fields designed to improve their general standard of living. The central question in community health is : Why do people behave as they do ? This is the basic problem which the social scientists are studying in India, and are often asked to explain this failure of health measures. In the western countries, social scientists are working on problems of mental health, hospital organization, social class difference in disease, rehabilitation, and professional roles and relationships. In industries, the social scientists are invited to look into the relationships between members of a team who are concerned with doing a job in order to improve the overall performance of the work team. In short, the social scientists are stepping in increasing numbers into the field of community health. The theme common to community health and social sciences is human behaviour. Many community health problems in essence are social problems, and vice versa.

2. CLINICAL MEDICINE

During the past half century, the scientific content of medicine has increased enormously. The acute

SOCIAL AND BEHAVIOURAL SCIENCES

Medicine and social sciences are concerned in their own special way with human behaviour. The term 'social sciences' is applied to those disciplines which are committed to the scientific examination of human behaviour. These are economics, political science, sociology, social psychology and social anthropology. The term 'behavioural sciences' is applied to the last three, i.e., sociology, social psychology and social anthropology, because they deal directly with human behaviour. Each of these disciplines, while sharing the major goals of social sciences, i.e., the scientific examination of human behaviour deals with specific aspects of public health in the study of man.

(a) ECONOMICS

The field of economics has a very close relationship with sociology. It is the parent discipline from which sociology has emerged. Economics deals with human relationships in the specific context of production, distribution, consumption and ownership of scarce resources, goods and services. Sociology and economics overlap in many senses; both are concerned with interdependence in human relations.

(b) POLITICAL SCIENCE

Historically economics and political science tended to be a single discipline. As a separate discipline, political science is concerned with the study of the system of laws and institutions which constitute government of whole societies.

(c) SOCIOLOGY

Sociology deals with the study of human relationships and of human behaviour for a better understanding of the pattern of human life. It is also concerned with the effects on the individual of the ways in which other individuals think and act.

(d) SOCIAL PSYCHOLOGY

This discipline sprang from psychology. It is concerned with the psychology of individuals living in human society or groups. The emphasis is on understanding the basis of perception, thought, opinion, attitudes, general motivation and learning in individuals and how these vary in human societies and groups. In other words, it deals with the effect of social environment on persons, their attitudes and motivations.

(e) ANTHROPOLOGY

The word anthropology is derived from the root words, *anthropos* meaning man and *logos* meaning science. It is the study of the physical, social and cultural history of man. The study of human evolution, racial differences, inheritance of bodily traits, growth and decay of the human organism is called *physical anthropology*. The study of the development and various types of social life is called *social anthropology*. The study of the total way of life of contemporary primitive man, his ways of thinking, feeling and action is called *cultural anthropology* (4). Of all the sciences, which study various aspects of man, anthropology is one which comes nearest to being a total study of man. *Medical anthropology*, deals with the cultural component in the ecology of health and disease.

SOCIOLOGY

Sociology is derived from the Latin *socio*, meaning society and the Greek *logos*, meaning science. The word

society is derived from the root words *socius*, individual and *societa*, meaning group. Society is individuals who have organized themselves and given way of life, and sociology is the study of individuals as well as groups in a society. Sociology can be viewed from two angles: (a) First, it can be seen as the study of relationships between human beings, and how these relationships change or vary in different parts of a society and at different times. The unit of study can be a small group (e.g., family) consisting of parents and children, or a large, complex society where a greater number of people live and interdepend in terms of economics, political organization and ways of living. (b) The other aspect of sociology is concerned with the study of human behaviour. Human behaviour is determined not merely by biological and physical environmental factors but also by social factors. Every form of human behaviour has a social component. Sociologists are interested in the study of the social determinants of human behaviour. In their analysis it may be stated that the aim of sociology is to search for the pattern of relationships between people in order to pave the way for the betterment of individual and relation to society (5).

SPECIALIZATION WITHIN SOCIOLOGY

Sociology has grown rapidly since World War II resulting in an increase in specialization within the general field of sociology. Some of the major fields of specialization are medical sociology, urban sociology, rural sociology, industrial sociology, sociology of religion, sociology of education, criminology, hospital sociology, and demography.

MEDICAL SOCIOLOGY

Medical sociology is a specialization within the field of sociology. Its main interest is in the study of health, health behaviour and medical institutions. As a specialized field, it was first proposed by Charles McIntire in 1894 (6). It is defined as "professional endeavour devoted to social epidemiology, the study of cultural factors and social relations in connection with illness, and the social principles in medical organization and treatment" (6).

Broadly speaking medical sociology includes studies of the medical profession, of the relationship of medicine to the public, and of the social factors in the aetiology, prevalence, incidence and interpretation of disease.

CONCEPTS IN SOCIOLOGY

Such terms as society, social structure, social institutions, role, socialization, social control mechanisms, class, culture, acculturation, social problems, social pathology and social survey are frequently used by all sociologists and form part of the necessary equipment by means of which they organize their thinking, do research and communicate the results of research (7). Some of these concepts have also crept into medical terminology and are being increasingly used in epidemiological studies. A brief account of these concepts is given below.

SOCIETY

Human beings everywhere are members of a group or groups. A man who can live without society, said Aristotle, is either a beast or God. A group of people may or may not form a society. For example, a group of people coming together

temporarily for a while to witness a hockey match do not constitute society; they are merely a crowd. But if the same group of people settle down and organize themselves, then they form a society. Thus, society may be defined in simple terms as an organization of member agents. The outstanding feature of society is a system – a system of social relationships between individuals. The importance of society lies in the fact that it controls and regulates the behaviour of the individual both by law and customs. It can exert pressure on the individual to conform to its norms. In short, society is a vast network of relationships and compulsions that propel, direct and constrain man's individual efforts. The character of society is dynamic; it changes over time and place. Public health is an integral part of the social system. It is influenced by society, and society by public health. In many places it is the social organization that has made it possible to translate into practice the scientific concepts and achievements. As a result, the mortality rates have been brought to low levels and the life expectancy at birth has soared to very high levels.

✓ COMMUNITY

Various definitions of community are given in dictionaries and other publications. Some imply homogeneity, e.g., "The people living in a particular place or region and usually linked by common interests" (8); or "A group of individuals and families living together in a defined geographic area, usually comprising a village, town or city" (8).

The definition accepted by WHO Expert Committee is "A community is a social group determined by geographical boundaries and/or common values and interests. Its members know and interact with each other. It functions within a particular social structure and exhibits and creates certain norms, values, and social institutions. The individual belongs to the broader society through his family and community (8)."

SOCIAL STRUCTURE

Social structure refers to the pattern of inter-relationships between persons. Every society has a social structure – a complex of major institutions, groups, power structure and status hierarchy. The study of social structure is comparable to the study of anatomy and that of social organization to that of physiology.

SOCIAL INSTITUTIONS

A social institution is an organized complex pattern of behaviour in which a number of persons participate in order to further group interest. The family, the school, the church, the club, the hospital, political parties, professional associations and the panchayats are all social institutions. Within each institution, the rights and duties of the members are defined.

ROLE

In a society, individuals are allocated roles as people in a drama. Sociologists have classified roles into ascribed and achieved, according to whether a particular role is "given" by virtue of sex, age, and birth status or "acquired" by virtue of education or otherwise. In a single day, a man may play a role of education or otherwise. In a single day, a man may play a role of husband, father, employee, friend, son, brother, committee chairman, guest, neighbour. The playing of these roles enables him to cooperate with others in many situations according to well-defined roles (9). When a person falls ill, he assumes what is known as a "Sick role". In this role he is expected to decrease or relinquish his normal

duties, seek medical aid, and carry out the orders given by the physician.

SOCIALISM

Socialism, to put it briefly, is the general term for any economic doctrine that favours the use of property and resources of the country for the public welfare. It is a system of production and distribution based on *social ownership* for raising the living standard of the working class, as opposed to capitalism which is based on *private ownership* of the means of production and aims at maximum private profit at the expense of the working masses. While the motto of capitalism is 'all for each' and 'each for each', that of socialism is 'all for all' and 'each for all'. These are two extremes. Ever since Louis Blanc set forth the socialist principle "from each according to his abilities, to each according to his needs", socialism has undergone many changes and taken varied shades.

SOCIALIZATION

Every society has its beliefs, customs, traditions and prejudices. A man acquires these in his everyday social interaction with the people of the society. This is called "socialization" or the process by which an individual gradually acquires culture and becomes a member of a social group. Children going to school is an instance of socialization. The internship training programme of doctors is another instance; it gives them an opportunity to learn how to become acceptable to the public at large as doctors.

SOCIAL CONTROL MECHANISMS

In every society there are rules, formal and informal, for the maintenance of relationships of authority and subordination. The laws and enactments of Parliament are social control mechanisms. In the field of health, there are various Acts, some central and others state or local which help to maintain the standards of health. Even in small organizations, there are sets of formal rules and regulations which control the behaviour of individuals to perform different roles. Besides formal rules, sometimes, informal social pressures are brought to bear upon individuals to help construct "norms" of behaviour. The informal social pressure may be exerted by powerful groups, individuals or friends. These mechanisms work largely through reward and punishment. For example, in India, the government is offering a small financial reward to those who undergo sterilization operation. It is a sort of informal social pressure to further the programme of family planning in India. The social control mechanisms vary from group to group. A study of these mechanisms may be helpful to the community health worker in carrying out the health programmes.

CUSTOMS

The mere existence of a society, the mere plurality of individuals gives rise to customs from which no single member of the community can escape. The 'highly developed' societies of the modern world are just as replete with social customs as the 'primitive societies' of the past. These customs are quite numerous and quite as powerful. Customs are technically divided into "folkways" and 'mores'. The folkways are the right ways of doing things in what is regarded as the less vital areas of human conduct. The more stringent customs are called "mores". The public takes an active part in their enforcement. Laws are generally customs-inspired. The starting point of all customs is

convention. Convention is the practice promoted by convenience of the society or the individual.

CULTURE

The word "culture" is widely used in sociology. It is the central concept around which cultural anthropology has grown. Culture is defined as "learned behaviour which has been socially acquired". Culture is the product of human societies, and man is largely a product of his cultural environment. Culture is transmitted from one generation to another through learning processes, formal and informal. Culture plays an important part in human societies. It lays down norms of behaviour and provides mechanisms which secure for an individual his personal and social survival (4). In general, it is widely held, that culture stands for the customs, beliefs, laws, religion and moral precepts, arts and other capabilities and skills acquired by man as a member of the society.

Cultural factors in health and disease have engaged the attention of medical scientists and sociologists. Every culture has its own customs, some of which have a profound influence on the incidence of disease. In developed countries, for example, cancer of the lung from smoking and cirrhosis of liver from drinking are the result of the abuse of widely proclaimed social habits. In India, chewing pan is associated with oral cancer. It is now fairly established that cultural factors are deeply involved in matters of personal hygiene, nutrition, immunization, seeking early medical care, family planning, child rearing, disposal of refuse and excreta, outlook on health and disease - in short, the whole way of life.

ACCULTURATION

Acculturation means "culture contact." When there is contact between two people with different types of culture, there is diffusion of culture both ways. There are various ways by which culture contact takes place (10). (1) trade and commerce, (2) industrialization, (3) propagation of religion, (4) education, and (5) conquest. The British brought their culture into India through conquest. An Indian is said to be the next best Englishman. It is because of culture contact, which has both good and bad aspects. The introduction of scientific medicine is through culture contact. The changes in food habits of people is brought about through culture contact; many orthodox brahmins in India today eat meat. The widespread use of tobacco all over the world is because of culture contact. The radio, the television, the cinema have been important factors in shaping the cultural-behaviour patterns of people.

STANDARD OF LIVING

The term "standard of living" refers to the usual scale of our expenditure, the goods we consume and the services we enjoy. It includes food, dress, house, amusements and in short the mode of living.

The standard of living in a country depends upon : (1) the level of national income (2) the total amount of goods and services a country is able to produce (3) the size of the population (4) the level of education (5) general price level and (6) the distribution of national income.

There are vast inequalities in the standards of living of the people in different countries of the world. The extent of differences in the level of living can be known through the comparison of *per capita income* on which the standard of living of people primarily depends.

DYNAMICS OF SOCIAL CHANGE

The interaction between social factors and health issues is complex and sometimes unpredictable. For example, in Western Europe during the nineteenth century, increase in income and wealth, resulting from the Industrial Revolution, was accompanied by decrease in both birth and death rates. Many authors have in fact argued that increased income was the main cause of these changes (2). The situation in the developing world has varied and differs from the so-called "demographic transition" in Europe. In many parts of Asia, and to a certain extent in Latin America, death rates, particularly among infants, have declined steadily in the past decade and birth rates have declined rather dramatically. Yet the increase in income has been very modest. In Africa, on the whole, death rates, particularly of infants, remain high, birth rates are not declining, the benefits of increased income are not yet apparent, and concern over population growth is just emerging. The relationship between wealth, birth, and death rates observed in the development of West European countries, is thus obviously not universal (2).

A typical feature of traditional societies is a sense of continuity and immutability in patterns of social life. Transitional societies may be better able to cope with change, and modern societies are perhaps best adapted to assimilate rapid changes. A major difference between traditional and modern societies is that, in the former, young people can be fairly sure that their lives will be substantially similar to their parent's, while, in the latter, young people can be fairly sure that their lives will be substantially different from their parent's, and that their children's lives will be different from their own. In transitional societies, young people may simultaneously be involved in two cultures : the traditional one in which their parents grew up and which they still value, and the modern one which may be portrayed in the mass media. A similar clash of cultures may occur in the lives of young people whose families have migrated to another country or from a rural to an urban area (2).

SOCIAL STRESS

A major source of stress, particularly in transitional societies, is the conflict generated by new opportunities and frustrations arising from societal changes. These stress-inducing conditions include : the wave of migration from rural to urban areas and the consequent diminution in the traditional family support system; a greater exposure through mass media to ideas that had been previously culturally alien; tourism; changes in the technological needs of society requiring skills that are different from those of the previous generation and for which the training or education available may be inadequate and the encouragement by commercial interests of economic aspirations that are often unrealistic (2). The pressure is mostly felt where young people have little control over their own destinies, where rapid population expansion means greater competition in the younger age groups, and where resources are inadequate to meet their needs.

It is well understood that the causation of physical and psychological disorders is multifactorial. The experience of stress, particularly in the absence of a social support system or when there is a discrepancy between the actual and perceived demands of a stressful situation, may contribute to further disorders (2). Psychological stress and inadequate coping ability has been implicated as a contributory factor in virtually all diseases (2). In particular, there are direct links between stress and hypertension and coronary heart disease.

SOCIAL PROBLEMS

In a community, there are both individual and social problems. Individual problems become social problems when they affect a large number of people amounting to a threat to the welfare or safety of the whole group. But all individual problems are not social problems. Poverty, crime and disease are the common social problems. Many public health problems are social problems and vice versa. Alcoholism, venereal diseases, mental illness and narcotic addiction are both, public health and social problems. Such social problems as housing, divorce, population growth, increased number of old people have public health implications calling for a combined sociological and public health action.

SOCIAL PATHOLOGY

The term "social pathology" is given a restricted interpretation linking it to poverty, crime, delinquency and vagrancy. In the modern context, the term is also used to describe the relation between disease and social conditions. The social pathology of accidents, diabetes, cardiovascular disease, cancer, chronic bronchitis have all been subject of recent investigations in medical literature. Social pathology is uncovered by "social surveys".

SOCIAL SURVEYS

Social surveys disclose social pathology. Social surveys have played an important part, in the development of public health. It was such a survey by Chadwick that led to the foundation of the General Board of Health in 1848 in Great Britain. There is a strong kinship between epidemiological survey and social survey. When the objective of the research is to study the role of social factors in the aetiology of disease, the two merge into what is known as "social epidemiology". Large scale social epidemiological studies have investigated the relationship of social factors to heart disease, cancer and arthritis (11).

CASE STUDY

Case study is a method of exploring and analyzing the life of a social unit – be that unit a person, a family, an institution, culture group, or even an entire community. Its aim is to determine the factors that account for the complex behaviour patterns of the unit and the relationships of the unit to its surrounding milieu. The case study differs from the survey in the respect that it attempts to collect a large amount of information from a small number of units whereas a survey collects a relatively small amount of information from a large number of units. Thus the case study can yield valuable data about the unit studied than is possible from survey data. A combination of survey and case study could, for example, provide more information about a population of interest than either method could do alone. A case study also has its limitations, i.e., a single instance may or may not be representative of a larger population.

FIELD STUDY

Whereas surveys are concerned with the breadth of knowledge (systematic collection of data from population or samples of population through personal interviews or other data-gathering devices), field studies are concerned with depth of knowledge; they involve observation of people *in situ*.

COMMUNICATION

The term "communication" refers to a social process –

the flow of information, the circulation of knowledge and ideas, and the propagation of thoughts. The role of communication in community health is to help motivate people to accept ideas; the ultimate aim of communication is to bring about changes in behaviour. The *mass media* (e.g., song and drama, radio talks, posters) are extensively used as vehicles of dissemination of information.

SOCIAL DEFENCE

A new concept has come into vogue in recent times – the concept of social defence. It covers the entire gamut of preventive, therapeutic and rehabilitative services for the protection of society from antisocial, criminal or deviant conduct of man. Included in this are measures relating to the prevention and control of juvenile delinquency, eradication of beggary, social and moral hygiene programmes, welfare of prisoners, prison reforms, elimination of prostitution, control of alcoholism, drug addiction, gambling and suicides (12). Many States in India have enacted the Children Act for the prevention and control of juvenile delinquency. Under the Suppression of Immoral Traffic in Women and Girls Act, services are being provided for the elimination of prostitution in society. Social defence is a system developed to defend society against criminality not merely by treating and defending the offended, but also by creating such conditions in the community which are conducive for a healthy and wholesome growth of human life. The Government of India renamed the Central Bureau of Correctional Services as National Institute of Social Defence in 1975. This Institute is under the Department of Social Welfare.

PSYCHOLOGY

Psychology is defined as "the study of human behaviour – of how people behave and why they behave in just the way they do". It is concerned with the individual, his personality and behaviour. A knowledge of psychology is essential to know others better; to differentiate between the normal and abnormal, to understand attitudes, beliefs, learning and memory processes; and to help promote mental health in individuals and families.

Scope of psychology

Psychology is vast in its scope, as indicated by the numerous branches of psychology, e.g., normal psychology, abnormal psychology, educational psychology, social psychology, child psychology, applied psychology, psychoanalysis, etc. Medical psychology deals with patients suffering from disorders of the mind. Persons trained in medicine and psychology are called psychiatrists. Thus psychology includes every aspect of human life and every type of human relation.

DYNAMICS OF BEHAVIOUR

The theme common to community medicine and psychology is human behaviour i.e., manner of acting or of conducting one self. The main concern of psychology is to study human behaviour. Human behaviour is the result of physical and mental factors (body and mind) interacting in complicated ways. Behaviour is "the total reactions (of an individual) accessible to external observation. Thought and understanding are implicit behaviour which are observable not directly, but solely by inference from other observable behaviours."

The broad categories of factors that may influence individual and community health behaviour include :

knowledge, beliefs, values, attitudes, skills, finance, materials, time, and the influence of family members, friends, co-workers, opinion leaders, and even health workers themselves. Serious consideration must also be given to the community or social context in which a given type of behaviour occurs. Pervasive issues such as norms, male/female roles, ethnic discrimination, poverty, unemployment, and educational opportunities may limit the ability of some of the sections of the community to behave in a healthy manner (13).

Cultural and social factors provide a setting for individuals. However, behavioural decisions may also be made that are other than those predicted on the basis of these factors. Psychological factors relating to public health programmes may be considered under the heading of health, illness and treatment behaviours.

Health behaviour

Health behaviour refers to those activities people undertake to avoid disease and to detect asymptomatic infections through appropriate screening tests. For instance, sexually transmitted diseases can be prevented by avoiding sexual exposure with infectious sexual partners. Other health behaviours that might reduce the risks of infection include the use of condoms, of bactericidal products immediately before and after sexual exposure, and the appropriate use of antimicrobial agents with proper supervision (13). In addition the risks of transmission can be reduced by assisting in the detection of infection in sexual partners before they have further unprotected sexual exposure with other susceptible partners. People with good health habits (e.g., daily brushing of teeth, non-smoking) are less likely to develop venereal infection than persons with poor health habits (13).

Illness behaviour

Illness behaviour refers to how people react to symptoms. Generally, people who detect symptoms will wait to see if the symptoms persist or worsen. If the symptoms continue, the affected person may ask a friend or acquaintance for advice, before seeking medical help.

Treatment behaviour

Treatment behaviour refers to those activities used to cure diseases and restore health. It is important for patients to take medication as directed, return for tests for cure, and cooperate in efforts to identify untreated cases. Research has not shown that any particular group or personality type is more compliant than any other.

All forms of behaviour are responses to stimuli. For example, a child sees a dog rushing towards him, and starts running away. The sight of a dog rushing towards him is the stimulus and running away is the response. To understand behaviour, we must find out the cause for stimulus. The goal of psychology is to find relations that exist between stimuli and responses.

RESPONSES

The various responses may be classified as follows :

- i) *Physical responses* : habits, skills
- ii) *Organic responses* : emotions, feelings, tension
- iii) *Intellectual responses* : perceptions, thinking, reasoning.

CAUSES

All behaviour is caused, and the causes are very complex. They include :

i) Environmental stimuli

The environmental stimuli (e.g., sight, smell, touch, etc.) reach the cerebral cortex through nerve impulses. The information received is assembled and evaluated. By another set of impulses, the cerebral cortex "orders" the behaviour of the individual. This is known as **conscious behaviour**. It is the behaviour determined by the standards or expectations of the society, e.g., professional behaviour of doctors with patients. This accounts for the variation in a person's behaviour in different situations.

ii) Emotions and feelings

Behaviour is also dependant on our feelings and emotions. These stimuli arise from within the body. When we say a person is blind with rage or paralysed with fear, we mean that he is a victim or captive to his own emotions. Emotions thus affect our behaviour. The seat of primary emotions (e.g., anger, joy, hunger) is the thalamus in the brain. It is under the control of cerebral cortex. When the influence of cerebral cortex is removed, as for example, when an injury to cerebral cortex occurs, the person's behaviour may be affected.

iii) Needs

An individual's behaviour is also influenced by his needs. The terms - needs, wants, desires and urges are used synonymously.

iv) Motivation

Motivation is an inner force which drives an individual to a certain action. It also determines human behaviour. Without motivation, behavioural changes cannot take place.

v) Intellectual perception

A person's intellectual perception, thinking and reasoning can influence his behaviour in a given situation. That is why each individual behaves in ways which make sense to him.

Making adjustments

Behaviour is also described as an **adjustment** to meet the needs of a given situation. For example, when a person does not succeed in something there are several ways he or she can react:

- losing temper and complaining to every one
- isolating oneself or simply avoiding facing others
- making excuses for the failure
- accepting failure with good grace and making ~~adjustment~~ by changing his behaviour or otherwise.

This adjustment is both active and passive. That is why some people blow hot and cold to suit their physical and social environment.

Unconscious behaviour

There is also behaviour of which the individual is not conscious. For example, if ten people witness an accident, we get ten conflicting reports of the accident. This is because of certain forces (e.g., perceptions, prejudices, and notions) which colour the incident, over which the individual has no