Cultural Aspects of the Transmission of Cholera

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My wife and I recently carried out a year of anthropological fieldwork in rural East Pakistan as part of the epidemiological program of the Pakistan-SEATO Cholera Research Laboratory (CRL). Our purpose was to investigate cultural and environmental factors that could be important in cholera transmission. At the same time we studied rural social life generally. Our method was the traditional one of anthropological fieldwork: We lived among the people we studied, visited their homes, and participated in social activities.

Our base was at Shotiki Bazar in Shaitnal Union, 23 miles southeast of Dacca in Comilla District. We chose Shaitnal because (1) cholera is believed to be endemic there; (2) it is accessible from Dacca but not so close as to be unduly subject to urban influence; and (3) observations made there are likely to be valid also for the CRL vaccine trial area at Matlab eight miles to the south.

The results of the study are now being pieced together. This involves sorting and classifying hundreds of day-to-day observations; comparing statements about behavior with direct observations; identifying patterns and trends in the data; and attempting to view the society both as a whole and as a series of connected parts. Preliminary papers have been presented elsewhere on (1) attitudes toward health and disease (Shirley Glasse), and (2) the structure of rural social groupings in the Shaitnal area (R. M. Glasse). A paper on sanitary practices is in progress, and analysis of customary behavior among kith and kin has begun. This report is simply a broad sketch of the ecological and cultural setting for cholera in one part of East Pakistan.

Ecology

Bisected by the Tropic of Cancer, the Bengal delta is basically a hot, wet land. It is cleft by innumerable rivers that flood during the monsoon. The Union of Shaitnal lies in an embayment of lowland which forms the most amphibious part of the delta during the rains. Then the lower tracts are flooded to a depth of 8 to 15 feet; consequently homesteads are built on earth platforms 15 to 20 feet high.

The monsoonal winds largely govern the seasonal cycle. Winter with warm dry days and cold nights lasts from December to February. Hot weather with temperatures reaching the nineties begins in March and continues until the monsoon breaks in June. During this period rain falls occasionally, high humidity prevails, and from time to time nor'westers of hurricane force cause havoc, destroying homes and crops. In June, when the rains begin in earnest, the temperature drops several degrees, the rivers rise, inundating the paddy and jute fields, forcing the small animals to higher land. In the country all communication then is by boat. From June to September more than half the annual rainfall of 90 to 100 inches pours down. The monsoon retreats in October; again the temperature rises and cyclonic storms may occur. In late September the flood waters begin to recede. The main rice harvest starts in November and lasts for about 6 weeks.

The people of Shaitnal relate the occurrence of cholera-like diarrheal disease to the seasonal cycle. They say that cholera occurs rarely during the rainy season and that high-incidence outbreaks usually occur between mid-November and mid-December and again from mid-March to mid-April. They attribute the autumn outbreak to impurities suspended in the dugout water tanks that have not had a chance to settle. After the flood has receded the tank water settles and becomes clear. From then until the spring outbreak people believe the incidence of cholera is generally low. They attribute the spring outbreak to dirty water also; when supplies in the storage tanks are low the concentration of impurities rises and a green scum forms on the surface of the water. Once the supply has been replenished by fresh rain water, people believe, the incidence declines again. This pattern does not recur every year, however, and today many people consider that the annual incidence is diminishing, owing to increased acceptance of vaccination and more widespread use of tubewell water and latrines. No reliable evidence is available, however, to support or contest this view.

The closeness of settlement in rural East Pakistan is hard to convey to anyone who has not lived there. Even the casual visitor gains a limited impression, for during the day the children are at school and most of the men work in the fields. A few statistics will help to disclose the true density of settlement. Excluding river areas, population density throughout East Pakistan averages 1,000 persons per square mile. In some districts, such as

Comilla, the value reaches 1,800 persons per square mile. These figures are based on the total amount of residential, arable, and waste land. If we consider residential land alone, the density increases tenfold. Thus, at the height of the wet season, for example, at Shaitnal the actual density of population is 22,000 persons per square mile. Few rural populations anywhere in the world are so closely packed. Ominously, the population increases rapidly; between 1951 and 1961 the gain was 24 percent.

In addition to the heavy human population the land supports cows, goats, chickens, and ducks, not to mention marauding pariah dogs. Little space remains to shelter wild animals. At Shaitnal the last tiger was seen 70 years ago, the last crocodile, 25 years ago. One can still see snakes, jackals, and rodents. Bird life remains rich and varied, however, and some 70 species of fish are found in the rivers. Although scarce during the wet season, fish and crustaceans are the most important source of animal protein in the Bengali diet.

Virtually all arable land at Shaitnal is in use, and consequently little natural vegetation remains. Still the landscape is far from treeless; around each group of houses stand clumps of bamboo, tamarind, mango, date, banana, and papaya trees. The canals and ponds support an abundance of sedges, as well as the ubiquitous water hyacinth.

The main field crops are rice, jute, millet, pulses, oil seeds, sweet potato, onions, chillies, tumeric, and other spices. Jute is the principal cash crop at Shaitnal. Cultivators also sell surplus vegetables, such as pumpkins, gourds, cucumbers, egg plants, and beans, at the biweekly markets.

Land is desperately short and hence very expensive. The cultivator's life is made more difficult by natural calamities and climatic extremes: Obtaining a good yield depends upon the timing and amount of rainfall; the height and duration of the annual flood; and the occurrence or absence of storms at critical periods in the growth cycle. Occasionally, also, rivers change their course, destroying whole settlements and ruining acres of productive land.

The Community

Among the 13,612 people who live in Shaitnal (1961 census), males exceed females by 306. The discrepancy is perhaps attributable to female mortality in childbirth and from conditions associated with frequent childbearing. One out of four persons is literate in Bengali and a much smaller percentage, nearly all men, read or speak some English.

The layout of the settlement is amorphous and unplanned. The village has no center or common meeting ground; it consists of a series of small homesteads, each usually built around a courtyard, strung out like hydrocarbon molecules with no formula. In some areas river levees impose a linear layout, but in general at Shaitnal no pattern of settlement exists.

Urban utilities are very limited. Electricity has not yet come to the area, and there are no vehicular roads, no hospital, and no police post. There are four small primary schools, two high schools, and a union council office, all constructed of tin sheet. Half a dozen markets serve Shaitnal and the adjacent Union, operating twice a week. At the markets a few grocery shops open daily; a tailor makes clothing; a goldsmith, ornaments; an oil presser grinds mustard seed in his mill. Medical service is provided by homeopaths, ayurvedic, unani, and allopathic practitioners, some qualified but most trained for a few years as apprentices or self-taught from books or experience. Some keep small dispensaries at the bazars; they treat serious cases in the patient's home.

The social organization of Shaitnal is not easy to characterize briefly. The population is heterogeneous in many respects and stratified in a number of ways. Basically, the population contains three distinctive cultural groupings: (1) Sunnite Muslims, with a three-tier class structure now in a state of change; (2) Vishnuite Hindus belonging to several castes, most of whom are landless fishermen; and (3) itinerant, boat-dwelling Bede who claim to embrace Islam but who are casual in their observances.

At Shaitnal, orthodox Muslims (in the Bengali sense) form over 90 percent of the population. Most of the men are cultivators who work their own land or sharecrop for others. The per capita income and standard of living are very low. Poverty can be attributed to the rapid growth of the population and to the recently abolished zamindary system of land proprietorship. The latter was an ancient Bengali institution that was adapted by the British in the Permanent Settlement of 1793 to provide a fixed annual revenue for their administration. The abuses of this system are too well known to require comment here. Since the abolition of the zamindary at Shaitnol in 1956, the prestige and power of the zamindar families has declined, but they still play an important role in local politics and are still consulted in village disputes.

Today the Muslim class system is in a state of flux. The old bases of prestige—nobility of lineage, interest in land, adherence to traditional Islamic values—have been undermined. The newly emergent values are literacy, higher education, success in business, or holding a secure, well-paid, urban position. Nowadays 6 or 7 percent of the people of Shaitnol work, study, or reside in urban

centers, though they still regard the village as their home. A two-way traffic between the village and towns and cities has developed, bringing in its wake new technology, new ideas and knowledge.

The Hindu caste system, too, is undergoing change. Caste endogamy is still intact, but the possibility of widow remarriage is now being discussed and will probably occur within a decade. Rules prohibiting intercaste dining are now less rigorously observed, and new foods, such as onions, have recently been introduced into the Hindu diet.

The homestead

Yet much of tradition remains and family life in the homestead continues to provide the basis for most social activities. Though a homestead may consist of a single isolated hut, more often it includes several houses grouped around a central courtyard, outbuildings, such as barns, kitchens, and latrines, and sometimes a dugout water tank. The house has a high-pitched roof, thatched with grass or made of corrugated iron, if this is within the the householder's means. The walls are made of jute-stick matting or split bamboo, or more rarely of tin sheets or brick. The floor is hard-packed mud. The kitchen is separate from the main dwelling and may or may not have a roof. The hearth is moulded of indigenous clay; the fuel is cow dung cakes, jute sticks, or wood.

Most houses are partitioned into two or three rooms. The father or older boy may have a cubicle to himself containing a wooden bed, but in poor families most people sleep on mats or thin mattresses upon the ground. When a guest is present the father dines with him apart from the family, using the bed as a table if no table is in the house. Otherwise the family usually feeds as a group, squatting on mats around vessels containing the meal, usually curry, rice, and pulse.

At Shaitnal the homestead group averages 20 members. They are *ek gusti,* one family, in the extended sense. Each *gusti* has a known genealogy of three or four generations and the males are patrilineally related. A corporate unit, the *gusti* owns in common such property as water tanks, latrines, and a bungalow for visiting guests. The senior male heads the *gusti* and family members call on him to settle quarrels. Marriage within the *gusti* is permitted but rarely occurs.

Each *gusti* contains a number of joint and simple families. A simple family consists of a man his wife and their unmarried children; they usually live in one house and always have a common hearth. A joint family consists of several simple families, united by parental or sibling ties; typically it consists of a father, several of his married and unmarried sons, and their wives and children. The joint family cooks at a common hearth, stores grain in a common granary, accepts the leadership of the senior male, and holds rights in a common estate. Though the joint family has a common hearth, its members often sleep and dine in two or three houses. There is a cycle of development in the family: by marriage and the birth of children the simple family expands, becoming a joint family, and may endure as such for years. When the family head dies, however, the heirs may divide the estate, forming a number of simple families. This cycle of expansion and division never ends.

Preliminary analysis of the composition of the joint and simple families suggests that these units may be useful in epidemiological study. In a sample of 75 family units, comprising 409 individuals, there are 56 simple and 19 joint families. The mean size of the simple family is 4.53 individuals and of the joint family 8.16; the ranges are 1 to 10 and 3 to 18 members, respectively. The sex ratios are different also: 1.15 in the simple family against 1.66 in the joint family, both in favor of males. I believe analysis of age composition would also reveal significant differences between the two family types.

We have, then, a natural experimental situation for testing hypotheses about the role of food and water in the transmission of cholera. In both types of family food is prepared at a common hearth; water for household use is usually stored in a clay jar, one to each house, so that people eating food from the same hearth may be drinking water from a different source or water exposed to different possibilities of contamination. Observations such as these, when established for a larger sample, may help the epidemiologist to construct meaningful hypotheses concerning the relationships between the incidence of cholera and the role of food and water in the domestic setting.

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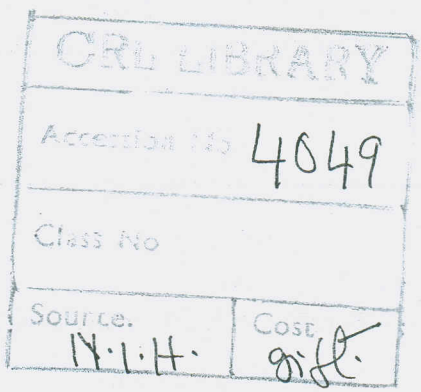

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