

Pasteur, attention was focused on the germ theory of disease, and there was a strong desire to improve personal hygiene and environmental sanitation as a means of interrupting the transmission of infectious agents. In addition, moves were made to meet other needs, such as housing, clothing and education. Wealthier and better-informed societies effected dramatic changes

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in the environment and improved health education. The concomitant improvement in income and living conditions resulted in the low infant mortality and high life expectancy at birth that characterized many advanced nations in the early 1960s. However, in the 150 years since Pasteur's discoveries certain industrial countries failed to achieve expected health goals, while suffering from pollution, urban violence, mental illness, drug abuse and alcoholism. During the same period, most of the less developed countries did not fully apply scientific knowledge to the betterment of hygiene, sanitation and housing, and some wasted their limited resources on less profitable endeavours, such as food distribution programmes.

The philosophical position of Professor Wolman is correct, as attested by the health profiles of industrial and less developed countries. Western Europe clearly demonstrates how better hygiene and living conditions can reduce morbidity and mortality, especially among young people (1).

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There is no valid excuse for failing to commit substantial resources to improving the environment

The primary aim of all governments should be to enable all their citizens to satisfy their basic human rights of freedom, adequate food, health and shelter. In the wake of

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The improvement of water supplies and the control of faecal waste were so extensive that infectious diseases, whether transmitted by water, acquired through person-to-person contact, or originating in faecal matter, became extremely rare. Malaria, once present in temperate Europe, was eradicated, and tuberculosis and other communicable diseases were also controlled. The nutritional status of the populations improved not only as a result of an overall correction of dietary deficiencies, but also due to a reduction in episodes of anorexia and nutritional wasting after the control of infections. These changes occurred prior to the discovery of some etiologies, specific therapies, and vaccines, and well in advance of the advent of antibiotics and nutritional science. This strengthens the concept that the quality of the environment has a primary role in curtailing morbidity and averting death. The beneficial effect of an improved environment is evident in Finland, Sweden, Switzerland, and other advanced nations. Gains have recently been noted in other European countries that had

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been lagging behind. Unfortunately, the application of economic models of development, without due consideration for the social determinants of health and disease, has resulted in an increased risk of pollution, stress and aberrant life-styles in some countries.

The current status of many developing countries is more complex, in that while

urban elites enjoy a quality of life similar to that observed in industrial nations, the majority of the people remain deprived of basic human rights. An added complication is the emphasis on short-term solutions, many of which are curative rather than preventive, while many have little or no demonstrable impact (2). Furthermore, action is often decided on for political or compassionate reasons, without scientific assessment of the nature of problems or of likely long-term benefits for whole populations (3).

In the Americas there has been a decisive international effort to encourage governments to undertake long-term improvement of the environment. Conferences held in South America by the Pan American Health Organization resulted in formal agreement among governments to improve health indices within stated intervals. The politicization of health concerns, coupled with a greater popular demand for health services, exert steady pressure for continued improvement. Water supplies, sanitation, housing, and incomes have improved considerably in several Latin American countries, and the changes were followed by better nutrition and reduced infant mortality, now below 30 per 1000 live births in several countries and below 20 per 1000 in two (4). Death rates due to diarrhoeal disease are now less than 15 per 100 000 in several countries, while the prevalence of intestinal parasites is declining in a few. Most nations benefit from some sort of primary health care, with a built-in component of rural water supply and sanitation. The decline in diarrhoeal disease and intestinal parasitic infection has been more marked in countries with improved water supplies, sanitation and education. Housing has improved less than the other determinants, but gains have been recorded even in certain slums in Caracas, Guatemala City, Lima and Rio de Janeiro, where

cardboard walls have been succeeded by brick, and earthen floors by cement or tile; water, electricity, sewers and other services have become available. Not surprisingly, in some slums primary health care is lowering infant mortality. Some of the gains seem to be marred by increased water and air pollution, noise, nonrecyclable garbage, and urban stress and violence.

Many poor countries in the last two decades have wasted considerable resources in food distribution programmes, on the assumption that the primary cause of malnutrition and low survival rates was inadequate food consumption. While the primary role of infection in the genesis of village malnutrition cannot be denied, dietary studies in villages around the world have shown that the overall level of food intake does not vary much from that of affluent groups in the United States and Canada. On the other hand, there is no sound evidence that supplementation of village diets corrects malnutrition in the community, whether in experimental trials, limited interventions, or at national level (5). Famine situations constitute an exception because here the limited food supply resulting from natural or man-made disaster is the main determinant of suffering and death.

A more realistic paradigm proposes that it is essential to control and prevent infectious diseases if child malnutrition and mortality are to be reduced (3,6). The assumption is that populations freed from the great stress of infection are better able to utilize available food, improve nutrition and survival, and increase production. This fits in partly with the historical evolution of European countries. It also agrees with the dramatic decrease in malnutrition and mortality—without a demonstrable increase in food consumption—in several developing countries which, in the recent past, have improved the environment, raised the level

of education, especially of women, and developed primary health care services. I am referring to Chile, China, Costa Rica, Cuba, India (Kerala State), and Sri Lanka (7,8). There seems to be evidence that food distribution improved in China and Cuba, but this does not appear to have happened in Chile and Costa Rica, where there was a dramatic decline in infant mortality to around 20 per 1000 in less than a decade. In these nations there has been a significant reduction in infectious diseases and in childhood mortality in a short interval; rates of severe malnutrition were sharply reduced, but those of low weight for age were not. Claims that infectious morbidity remains unchanged are not valid and detailed studies of the incidence of infection and the prevalence of intestinal parasites in one of these countries clearly showed a drastic reduction in the overall level of infection (8). It is obvious that the control and prevention of infectious diseases cannot be accomplished without significant investment in environmental sanitation and health education. Furthermore, it is not scientific, ethical or humane to concentrate on feeding populations while disregarding other basic human rights, since this amounts to keeping people in conditions comparable to those in pigsties.

Many planners and health workers neglect water and sanitation requirements on the basis that they are costly, and the cost always seems high to politicians. However, analysis of impact and cost/benefit leave no doubt that interventions in this field have a monumentally beneficial effect (9). To counteract negative attitudes one should advance the argument that the cost of illness and death averted by environmental programmes is always less than the cost of suffering and death inflicted by weapons and military actions during peace, repression, civil conflict or formal warfare. There is no valid excuse in modern times for any nation

failing to commit substantial resources to the improvement of the environment.

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