

A New Dimension for Health

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DISEASE and death are biological and ecological phenomena against which man has always struggled. Indeed they are attributes of life itself and some concept of their cause, prevention, and treatment must have guided the actions of even the most primitive civilization.

The concept of health, however, occupies a higher and later plane in man's social evolution. Health has always seemed to reflect an ideal, something more than the mere absence of disease. We are told that disease did not exist in Eden and that it was not known to the race which Prometheus created. It was inflicted upon society only after the serpent's temptation and after the opening of Pandora's box. So it can be said that ever since, Western man has sought to regain this lost paradise—with the help of hope in the platonic tradition and with the help of various prophets and symbols in the Judeo-Christian tradition. This aspiration is expressed in the WHO definition of health. We understand what is meant by "complete physical, mental and social well-being" only because, with all our imperfections, we sense that there is an ideal toward which we are driven to strive.

But if man is possessed of a sense of the ideal, he is also endowed with a practical sense and skills which he has put to use in his struggle against disease and premature death. During the last three centuries in the Western World man has made spectacular advances in this struggle. It is not surprising that the concept

of health has been influenced by these developments.

It was about 300 years ago that science broke through the scholastic conservatism of the Western past. Quantitation and experiment replaced vague observation and speculation not only in the physics of Newton, the physiology of Harvey, and the optics of van Leeuwenhoek, but also in the forthright materialism of Hobbes which carried this approach into the affairs of state and justified a sovereign national power on behalf of productivity.

The Utilitarian Approach

The spread of these doctrines into the field of health is best personified by the physician-economist, Sir William Petty. Speaking in Dublin in 1676, he expressed the practical utilitarianism of his day in the following words (1):

Now suppose that in the King's dominions . . . by the advancement of Art of Medicine a quarter part fewer dye. Then the King will gain and save 200,000 subjects, which valued at 20 pounds per head, the lowest price of slaves, will make 4 million pounds per annum benefit to the Commonwealth.

Petty did not value human life in terms of slaves; however, he was using what he termed political arithmetic to apply a practical approach to the social problems of his day. In another calculation based upon estimates of national income, capital, and productive capacity he arrived at a figure of £69 per head, a figure which he applied to the loss of 100,000 lives during a London plague epidemic. He estimated that an investment of about 1 percent of the monetary loss in preventive measures would have saved the state more than £6 million (2). He was also an ardent advocate of planning for hospitals and for the training of medical and paramedical personnel, and he developed ratios of the needs of the population

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based on the crude statistics available to him (1).

Petty's influence upon the national health program of his country was minimal because the strong centralized administrative authority needed to execute his ideas was lacking. The English Crown, restored to power after Cromwell and the Stuarts, turned toward foreign trade and colonial development, leaving matters of health to local government authorities.

Curiously enough, however, the same utilitarian and reforming approach to health which Petty represented was manifested 215 years after his death, this time in the very terms of foreign trade. This manifestation in 1902 resulted in the birth of the Pan American Sanitary Bureau, the oldest of the international health agencies. At this time, the First International Sanitary Convention of the American Republics met in Washington, D.C., convoked by a resolution of the Second International Conference of American States, which had been held in Mexico City almost 1 year previously.

These meetings took place at an exciting time in the history of the health sciences. The cause and methods of controlling the major pestilences of mankind had just been discovered or were better understood: plague, cholera, typhoid, smallpox, malaria, and yellow fever. However, this knowledge was not always diffused or accepted, and a confusing discrepancy of quarantine regulations existed. The United States itself, because of its decentralized governmental structure, had no national quarantine regulations until 1893. Even at the time of these meetings, each State had the right to enforce its own quarantine measures in addition to those of the Federal Government. All this seriously interfered with trade and was responsible for substantial economic loss. The resolutions adopted in Mexico City recommended to the governments "That prohibitive quarantine on manufacturers and merchandise shall be abolished" and that an international sanitary bureau be created "to lend its best aid and experience toward the wider protection of public health of each of the said (American) republics and that commerce between said republics may be facilitated" (3).

Simplicity in quarantine measures, "the sin-

fulness of a commercially conducted supervision, with destructive bias toward commerce by delays and fees" (4) was fully discussed in Washington. A number of specific resolutions concerning quarantine and the interchange of epidemic intelligence were adopted. Three years later, Surgeon General Walter W. Wyman, who had been elected director of the International Sanitary Bureau, could turn from these successful applications of man's utilitarian reasoning to his higher aspirations for health in words still meaningful today (5):

With this growing harmony and fraternity among the nations, there should be developed an international sentiment regarding sanitation and suppression of disease. If, as Tolstoi says, the only substitute for war is religion, international sanitation would be a powerful weapon in the hands of religion, if, indeed, it could not in itself be made a substitute for war. It surely would furnish a plane upon which nations might meet, and a more worthy object than war for the expenditure of energy and money.

The two centuries which intervened between the death of Sir William Petty and the discoveries in bacteriology which led to the First International Sanitary Convention were eras of intellectual, political, and industrial revolution. During the middle portion of the era (the so-called Age of Enlightenment) the political ferments gave birth to the revolutions which created many new countries in both North and South America. This was a time of intellectual optimism when man, with the help of the science and rationalism he had developed, seemed master of his destiny and perfectability. However, the practical applications of science prevailed over the philosopher. The Age of Enlightenment ended in the Industrial Revolution.

Social Conditions and Disease

During the early and middle parts of the last century, however, the stream of thought descending from the earlier revolutionary humanism of France developed, in the face of the health problems created by industrialization, in two major directions which influenced public policy and action—one in Germany, the other in England.

The first of these directions was expressed most vigorously in the person of Rudolf Vir-

chow and in the medical reform movement of the German States. Better known today for his contributions to pathology, Virchow was throughout his life a champion of social reform and a keen observer of the relationship between social conditions and disease. Early in his career he concluded that the causes of a typhus epidemic in Silesia were as much social, economic, and political as they were biological and physical. Although he recognized the discoveries of the bacteriologists, he could never accept an unqualified causal relationship between bacteria and disease (6). He certainly advanced the doctrine of multiple causation in the origin of disease. Toward the end of his life these views were discounted by his biologically disease-oriented compatriots. Today we can recognize the full justice of Virchow's assertions that disease can be understood in terms of biological adjustment and that certain types of epidemics are ecological—"indicative of defects produced by political and social organization and therefore affect predominantly those classes that do not participate in the advantages of the culture" (6). As a means of combating disease, Virchow and the German medical reformers advocated both social action and the provision of medical care. Writing of the duties of a democratic state—for Virchow was an ardent exponent of democracy—he said (6):

It is not enough for the state to guarantee every citizen the basic necessities for existence, and to assist everyone whose labor does not suffice for him to acquire these necessities; the state must do more, it must assist everyone so far that he will have the conditions necessary for a healthy existence.

Although the medical reform movement in Germany came to an end with the defeat of the revolution of 1848, its influence improved the laws for indigent care and later contributed to the ease with which Bismarck could introduce compulsory health insurance into the new Prussian State. By 1884 public medical services were established in Germany on virtually the same grounds as public education (7).

The influence of these trends in Germany was manifest in many other European countries and spread in time to Latin America where it established itself in the early 1920's as a system of social security to provide medical care to workers, among other benefits. In Latin America,

an older unorganized network of hospital services, which originated during the colonial days as charitable and governmental enterprises, was forced to expand by this new movement and to become virtually dependent upon the state for financing. Furthermore, the Latin American medical profession in general came to accept Virchow's premise that the state is responsible for health care of the low-income class. These developments and the extensions of the health care service, uncoordinated as they were and continue to be, antedated the appearance of "public health" on the Latin American scene as a community health service effort. The organized public health programs of Latin America derive, as we shall see, from another source.

The Sanitary Reform Movement

The inroads of the Industrial Revolution and the trend to urbanization which have continued to this day to drastically alter our ways of life were manifested earlier in England than on the continent of Europe. During the first half of the 19th century, mortality rates in the factory towns of England actually began to rise precipitously after a century of slow but regular decline. The miserable conditions of life, the hunger and communicable disease, the shortage of medical personnel and services, and the overpopulation and family disorganization of the industrial towns must have been not unlike conditions in many parts of Latin America today.

The superintendent of police in Glasgow described housing conditions in 1840 (8):

The houses in which they live are unfit even for sties, and every apartment is filled with a promiscuous crowd of men, women and children, all in the most revolting state of filth and squalor. In many houses there is scarcely any ventilation; dunghills lie in the vicinity of the dwellings; and from the extremely defective sewerage, filth of every kind constantly accumulates.

Attempts to deal with the mounting problems through the English Poor Laws and the provision of medical services were of no avail, in part because medical science had little remedy to offer at the time. However, it was through the Poor Law Commission inquiries and surveys that the relationship of environment to disease was forcefully stated. Humanity demanded that the sick poor be cared for, but the tax costs

were great and the results unsatisfactory. These points were carefully and convincingly documented by William Farr, who developed Petty's political arithmetic into the science of vital statistics. Gradually, over a period of more than 50 years, the urgency for social action and sanitary reform overcame the apathy of local government and the Victorian instinct for economy in public administration. During this time, modern public health became a recognized form of governmental activity in England and soon after in North America. The relative ineffectiveness of clinical medicine and the consequent limitation of public health programs to sanitary reform and education, which were so effective and necessary at that time, may also be responsible for some of our weaknesses as a profession and as a social institution 100 years later.

Until quite recently, public health concepts and programs in the Americas (strongly influenced by those of England) have been limited to derivatives of "sanitation" and "quarantine." We have made good use of all the knowledge we have acquired since the days of Chadwick, Southwood Smith, and the sanitary reformers. We have also made good use of the knowledge of epidemiology and communicable disease control which we have acquired since the days of Chapin, Carlos Finlay, Oswaldo Cruz, and Chagas. Yet, the image of public health in the minds of the people, in the minds of many physicians, and perhaps many public health workers as well can still be expressed by a jingle from the streets of New York.

"Marguerite,
Go wash your feet!
The Board of Health's across the street."

Within the Northern Americas, these conceptual limitations may not be too serious. Technological development of a wealth of natural resources in an essentially hospitable and unpopulated land have allowed capital accumulation to finance the expensive sanitary works of city and town. The hospitals, laboratories, and educational systems which together produce health personnel, advance scientific knowledge, and apply it to patient care can also be financed. What is more, the growth of these practical health bases has been spread over a period of time corresponding to the period of scientific

advance and economic development. It has been possible to adjust the various facets of what might be called the health industry and its products by a series of informal and unstated working agreements which meet the growth need or problem of the moment. Until recently, at least, the lack of planned cohesiveness and the uneven distribution of health services has not caused real concern. In the Middle and Southern Americas, however, the situation is otherwise.

The Internal Barrier

Organized community public health programs have developed in Latin America only during the past 30 years. It is natural that they should have been strongly influenced by developments elsewhere and often are no more than transplanted replicas of a pattern of services which fitted the needs of Northern American communities. For reasons which should be obvious, much of this initial effort did not spread as expected. Health centers were built which operated not only in alienation from the cultural values and expectations of the people they were meant to serve but also in isolation from the many other existing governmental activities in medical health care which antedated the advent of "public health" in Latin America. Unlike Northern America, these governmental activities provide and deliver the bulk of every sort of health care service to the community. More serious than the waste of these early public health efforts is the fact that they have left in their wake an internal barrier, erected as a kind of self-image in the minds of public health workers themselves, which blocks them from viewing their responsibilities within a more comprehensive framework encompassing all the activities for the welfare of the people.

During the century which has elapsed since Edwin Chadwick transferred his zeal for helping the sick poor into the movement for urban sanitary reform, the health sciences have discovered far more than those means of controlling infectious disease which the First International Sanitary Convention sought to apply. Hospitals are no longer pesthouses or asylums, and dispensaries are no longer purveyors of palliatives. Specific cures exist for the major in-

fectious diseases. The metabolic disequilibrium produced by the common diarrheal diseases can be overcome. The science of nutrition has demonstrated and identified the underlying nutritional basis for much of the excess childhood mortality in our world; it has also demonstrated that cheap and efficient sources of nutrients are available and can be mobilized indigenously in every part of the world to meet nutritional needs. These are only a few of the major advances of modern scientific medicine, those which have the greatest meaning to the technologically developing countries. Thus, public health, that is, the total health of the public in the sense of national policy and planning, has at its beck and call utilitarian tools which have never been available before. This is an observation of special urgency to countries less technologically advanced but no less aware of their health potential than the countries of Northern America.

Far from being limited to urban areas, as in Victorian England, the disease problems and the health aspirations of Latin America extend into most of its rural communities and through all the channels of modern communication. Few places are untouched in some way by the fingers of 20th century commerce, while the health contrasts of affluence and poverty remain all too easily documented in the "political arithmetic" of the northern and southern continents. The inference is not only for a broadening of the concept and actions of public health as an integral part of the development of Latin America; it is also for an extension of health insights and influences into almost all other aspects of national development and planning.

It is these inferences and implications viewed in the perspective of history that I should like to call the new dimension for health. It is, in brief, the unification of the ideal and the practical within the strategy of total national development. It expresses man's aspirations and recognizes that the economic productivity of a society is directly related to its health as did, in a different context, Petty and Virchow and the English sanitary reformers. For them, however, the relationship was based primarily on humanitarian and sociological criteria. We see it today in economic terms, emphasizing that man is the synthesis of all the efforts of every

society. This new dimension, therefore, sets specific goals for each activity, health included, and develops a methodology to attain them in an integrated manner.

Health in National Planning

This new dimension is clearly expressed in the Declaration to the Peoples of America and in the Charter and its appended resolutions, which emanated from a special meeting of the Inter-American Economic and Social Council held at Punta del Este, Uruguay, in August 1961 (9). Better known as the Alliance for Progress, these documents both affirm and illustrate the integrated totality of planning for economic and social development, for social action, and for health, education, and housing programs. Man himself rather than his commerce or the exterior manifestations of his living is the reason for planning. However, the Alliance's mechanism and implementation deal with cold, hard fact and the calculated application of scientific knowledge, human skills, and human resources to the problems at hand.

The objectives of a health program in the Charter of Punta del Este are variously stated as: "to strengthen our human potential" and "to increase the ability to learn and produce," phrases which imply the unity of the ideal and the practical. To these broad objectives must be added another series of very concrete goals to which a known planning process can be applied: "To provide adequate potable water supply and sewage disposal to not less than 70 percent of the urban and 50 percent of the rural population . . . to eradicate those illnesses, especially malaria, for which effective techniques are known . . . to train medical and health personnel to meet at least minimum requirements." Other objectives are stated in less precise terms: "To control the more serious communicable diseases . . . to improve nutrition . . . to improve basic health services at national and local levels . . . to intensify scientific research and apply its results more fully and effectively to the prevention and cure of illness." If these objectives are somewhat less concrete than the preceding set, it should be pointed out that the guiding directions and the "political arithmetic" to evaluate them are also

stated clearly among the health objectives: "To increase life expectancy at birth by a minimum of 5 years . . . to reduce the present mortality rate of children less than 5 years of age by at least one half."

Thus, we are presented with a series of goals, some of which derive from the tried and proven paths of the public past. These need only be extended into the Latin American future. Others derive from the fact that specific medical and scientific knowledge which can improve health is not being applied. To attain these latter goals will require the cutting of new paths, but paths adapted as naturally as possible to the unique terrain of Latin America. For this effort we shall need to survey the terrain and utilize all its best features. This is an important part of the planning process.

None of this is to say that the potential achievements of a unified health program will be simple to realize. Apart from the magnitude of the natural obstacles to be overcome, we have to contend with the separate administrative structures created in response to human needs but reflecting the diverse influences of the sanitary and medical reform movements of the last century, which in Latin America have tended to remain isolated from each other. We must also contend with schools of thought which view economic development as an end rather than a means. They would prefer that countries concentrate upon industrialization, assuming that health conditions and services will improve automatically as per capita income rises. Some would prefer to see the health services concentrate primarily upon preventing people rather than diseases.

There is no question that economic development is crucial to the improvement of health conditions. This is as apparent to us today as it was to Rudolf Virchow. However, we would also insist that wherever and whenever we can apply specific measures to improve the health conditions and the vitality of people, the very need for economic growth, quite apart from humanity itself, demands that we do so. The relationship is reciprocal and reinforcing rather than primary and secondary. Furthermore, the direction of agricultural improvement, the nature of many industrial activities, the provision of water and housing, and the

content of educational programs can all benefit from the past successes and failures of health programs and themselves apply the newer knowledge of the health sciences.

These are the challenges which the new dimension holds for us in public health. They are not new challenges, for we have seen them phrased in one form or another over the past 300 years. What is new is the opportunity to realize them with the least possible delay through acceptance of a mechanism, national planning, within which we can structure our efforts and unite them with those in other fields than health. We view the challenges as an opportunity because we possess aspirations. It is these aspirations for health which motivate us to apply our knowledge to destroy the limiting elements of disease.

As we struggle with the methods and means of applying what is known, science—as it seemed to be 200 years ago—appears on the threshold of penetrating into the biological secrets of life itself, perhaps even to the elimination of disease as an attribute of life. Whether or not the biochemistry of the gene will provide us with the means of eliminating disease, we should perhaps conclude by recalling the myth of Aesculapius. After the great physician had learned to bring the dead back to life and proceeded to do so, the gods of the Underworld were distressed at being robbed of their due. They persuaded Zeus to eliminate him with a thunderbolt. However, his daughter, Hygeia, the goddess of health, lived on. From this legend may we not conclude that the attainment of finite health—the absence of disease and even the absence of death—is not as paramount or as enduring as man's infinite striving for the perfection of his physical, mental, and social well-being.

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ADDENDA

Bedbugs in Relation to Transmission of Human Diseases

Ninety-three studies probing the possible role of bedbugs in the transmission of 41 human diseases were summarized in the June 1963 issue of *Public Health Reports*, pp. 513-524. Two additional studies have been uncovered, one on the relation of bedbugs to Chikungunya disease and the other to asthma, making a total of 43 diseases with which bedbugs have been associated. The additional data are presented below in the same style as the review article, under the headings of viruses and allergies.

VIRUSES

Chikungunya disease

Chikungunya disease virus

Cimex species. This denguelike disease, first noted in Tanganyika, was associated with mosquitoes and bedbugs. Seventeen bedbugs from the beds of infected persons were inoculated individually into groups of mice. Deaths occurred in five of the groups of mice. Three bedbugs were confirmed as infective by

repeated brain-to-brain passages. Two out of three batches of glycerinated bedbugs killed mice. Transmission attempts were made by feeding bedbugs on baby mice. Some mice died, but no virus agent could be recovered from them.—Ross, R. W.: *The Newala epidemic. III. The virus: isolation, pathogenic properties, and relationship to the epidemic. J Hyg* 54: 177-191 (1956).

ALLERGIES

Asthma

Cimex lectularius. A 37-year-old man had had asthma for 12 years. Skin tests with pollens, inhalants, and foods were negative. An extract was prepared from bedbugs infesting his bed. The patient reacted markedly to intradermal injection of the extract in 1:1,000 solution. Specificity of this reaction was established by the Prausnitz-Kuenster test in nonsensitive patients. This diluted extract gave negative results in 60 hay fever and asthma patients. The sufferer's bedding was changed, the bedbugs were eliminated, and the attacks ceased completely.—Sternberg, L.: *A case of asthma caused by the Cimex lectularius. Med J Rec* 129: 622 (1929).

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