# I. The Cardiologist Enlists the Epidemiologist

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I appreciate the opportunity as an internist primarily interested in cardiovascular disease, that is as a cardiologist of long standing, to take part in your public health program today. In introduction, I would like to emphasize the fact that I am primarily a practitioner of medicine, the son of a family doctor, and therefore, directly concerned with the individual patient who is the basis for all the important superstructures that have been added in the generations and decades that have passed, consisting of medical education, medical research, and public health. As one grows older in medicine, one naturally tries to unite the preventive aspects of health and disease to the care and advice one gives to one's private patients and their families. I spend a certain amount of time nowadays in advising fathers and mothers who are ill with heart disease about the future of the health of their children and of their childrens' children.

The most important kind of heart disease that has alarmed the world in general and this country in particular of late is, of course, coronary heart disease. During the last 35 years it has been the lot of cardiologists in the larger centers in America to face the growing threat of this scourge which began to be recognized as a possible danger to our civilization about ten years after James Herrick presented to us his memorable clinical discovery of coronary thrombosis itself. The first case of my own diagnosed as coronary thrombosis was in the second year of my private practice in January, 1921, and since that time I have seen increasingly every year a good many hundreds of cases. At first it was natural that our chief interest would be in the improvement of the diagnosis and treatment of the disease, but about 20 years ago attention began to be focused on a study of its causes. Prior to that time, there were only a few workers in this wilderness like Timothy Leary in Boston, Anitschkow in Moscow, and Aschoff in Germany, to present the needs for research.

Today we cardiologists realize the importance of enlisting the help of many experts in other fields in our attempts to solve the problem. These fields extend from the extreme of basic sciences —mathematics, physics, and chemistry— to the whole gamut of applied sciences— engineering, biology, comparative anatomy, physiology, and pathology. Experimental researches on animals in the laboratory, which should include much more study than now of the monkey, the application of physical and engineering laws, including hydrodynamics, to the effect on delicate tissues like the intima of the coronary arteries and aorta, and physiopathological effects of factors outside the artery walls and blood stream. All of these are in relatively early stages of research. Among the investigators must be included geneticists, of which we have far too few, and biostatisticians with whom the physicians themselves can work closely and in a practical way with mutual respect and cooperation. We must utilize the help of all these experts. This year happily, for the first time, funds have been allocated, both publicly and privately, to begin to study these problems

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more adequately, and especially to train future investigators.

We practitioners know from our own experience that basic factors behind coronary heart disease are of very great importance. These include the possible influence of race, the sure influence of heredity, of sex and of age, and quite likely X factors that are basic but of which we have not even thought as yet. Inasmuch as at present we can do little or nothing in the control of these factors, namely of race, heredity, sex, and age, despite the possibility of future practical application of some eugenic principles, it is quite natural to believe that we should spend even more time in efforts to protect candidates for coronary heart disease, concerning whom we have acquired some information of late, by practical and sensible modifications of environmental factors and their ways of life.

Environmental factors include stress and strain, about which we know relatively little, exercise, which some of us believe important but just how and why we do not know, local customs and personal habits, for example, in the use of tobacco and alcohol, and proper programs of rest and relaxation, and diet. There are still other factors not adequately recognized or even known as yet which we might call Y factors, corresponding to the unknown basic X factors. Laboratory experiments on animals and clinical and laboratory studies on man have been done fruitfully and should be continued, but a much neglected field, the surface of which has barely been scratched during the last five or 10 years, is that of the relationship of the ways of life to heart disease which we have come to call epidemiological cardiovascular research.

A good many of us who have been interested in the study of the etiology of coronary heart disease, long before the professional epidemiologists themselves took up the cudgels, have asked for help in the solution of the problem through emphasis on the probable importance of environmental factors in the causation and aggravation of the disease. We have talked for years about the relationship of the ways of life to the development of coronary atherosclerosis; for example, in my Hermann Biggs Lecture in New York City in 1940, I suggested the value of comparing 1,000 Vermont farmers who were then working physically hard with 1,000 New York bankers who at that time were still affluent, but this proposal was mostly talk and was interrupted by the Second World War. It has been only in the last few years that some of us have ourselves gone actively into the field, meanwhile hoping to enlist those who previously had been especially trained in epidemiological methods which, of course, in the past have been used largely in the fields of infectious diseases and malnutrition. The day of united effort is now dawning and we cardiologists must take advantage of the experience and the skills of the professional epidemiologist, while he in turn must learn about cardiovascular disease and get from us our firsthand experience with this malady. The initial studies that have been made during the past few years by such pioneers as Ancel Keys will now have more adequate support and development in the future. We should meanwhile pay tribute in the over-all picture to the early workers for their very important preliminary studies. It is probable that work in the field itself will continue to be more fruitful in the long run than armchair philosophizing, important as it is to do careful preliminary planning. We must always take advantage of lessons learned in the field.

My own experience to date has been that important clues can come from individual intelligent patients as well as from mass studies. A single observation by a single person may actually be more important in the long run than hastily

drawn conclusions from inadequately analyzed series of thousands of persons. We must keep our feet on the ground from both standpoints and make use of the family doctor as well as of the public health departments throughout the world. The cooperation of the family doctors is now most encouraging. A recent visit to Grand Forks, N. D., has demonstrated this to me. At a breakfast conference on a Sunday morning, more than 100 of the 135 total medical community assembled to discuss their part in the survey of coronary heart disease in the six northeastern counties of that state, with fringes in Canada and western Minnesota in the Red River Valley. From a study such as this can come much fruitful information, especially when a comparison can be added between such people living in this community of rich farm land with others of the same race living under far different circumstances. This type of investigation is new, complicated, difficult, and expensive, but it must be done and with the greatest care. The various factors must all be weighed and, although diet and its details, for example the actual kinds of fat involved, are currently in the limelight, we must not forget the basic factors of which I have already spoken and other environmental factors such as exercise, stress and strain, and personal habits. "One man's meat is another man's poison" doubtless still holds true with respect to coronary atherosclerosis and its sequelae.

Finally, here is an opportunity for the establishment of international medical cooperation and friendship which can certainly advance the cause of world peace. Two years ago at the parting of a number of us from different countries, after an investigation in Naples, Italy, by a team including Swedes, Englishmen, an Australian, a South African, Italians, Americans, and a Yugoslav, a young Italian biochemist said in parting to his young Yugoslav colleague—"Isn't it strange that we were so recently at war?" The answer quickly came when the Yugoslav answered—"Why I never thought of it." I am quite sure that the furtherance of our program can do better than merely wishful thinking. The visit that some of us paid to Moscow in September, 1956, demonstrated clearly to us the desire of the physicians themselves and of public health workers to join us in the furthering of health and happiness throughout the world.