CHAPTER VII

The Years 1953–1971

With the introduction and widespread use of antibiotics, there was a flareup of the old problem of the clinician’s view of the microbial agent as the sole cause of an infection, versus the epidemiologist’s perspective which recognized the heterogeneous nature of causes, with the host and the environment playing important roles as etiologic determinants. By 1953, the sulfonamide drugs had been in use for some 15 years and the newer antibiotics for 6–8 years. The miraculous effectiveness of penicillin and other antibiotics in rapidly eliminating streptococcal infections and in curing patients with pneumonia encouraged the clinician’s tendency to regard every infection as being due to a single agent, which, if it could be found, could yield to a single specific drug. But practical and realistic as this philosophy was therapeutically, the idea of a single etiology did not fit with a doctrine which epidemiologists had been trying to promulgate for years—namely, that the causes of disease were, in general, multiple. These involved complex patterns of host resistance, ways of living, and various sociological and environmental influences. This difference in point of view was to drive a temporary wedge between the philosophies of epidemiologists and clinicians.

In 1938, the author, sensing a unilateral trend, had occasion to make a plea before an audience of clinical investigators about the morality of championing a single cause as the realistic or final determinant of human illness. He said that conservative opinion which did not allow anything to be really considered as legitimate etiology in this technical age was based on a false premise:

Of late years conservative opinion does not allow anything to be really considered as etiology unless we can succeed in getting it (i.e., the cause) into a test tube, unless we can precipitate it—unless we can crystallize it, as it were. This is due, of course, to our current methodology which has become more of a religion than most of us realize. I think it may have led to a slightly narrow interpretation of clinical investigation on our part—for clinical investigation certainly should be given the opportunity to spread up into philosophy, if it will, or down into the basic sciences (1).

This plea fell on deaf ears, probably because the audience and those members of the medical profession who read the article, recognized in it the voice of the evangelist. And yet, gradually some realization of the epidemiologist’s point of view developed as a ground swell during the second half of the twentieth century, particularly when noninfectious disease began to assume a more pervasive role.
It had already become abundantly clear (by 1940) that in the United States the leading causes of death were rapidly shifting away from acute infections (2) (Table 1). The trend, which was accentuated in the ensuing two decades, was accompanied by rising rates of ischemic heart disease and cancer (Table 2). Also, there was an appalling increase in rates of motor vehicle accidents, diseases aggravated by air and water pollution, mental illness, and conditions which for want of a better name could be described as arising from social ills—urban slum problems, juvenile delinquency, and drug addiction.

| TABLE 1 | TREND IN AGE-ADJUSTED DEATH RATES FOR SELECTED CAUSES OF DEATH, UNITED STATES, 1900–1940a,b |
|-----------------------------------------------|--------------------------------------------------|
| Cause of deaths in rank of order for the year 1900 | Deaths per 100,000 population | Percentage change 1900–1940 |
| 1. Pneumonia (all forms and influenza) | 210 | 70 | −67 |
| 2. Tuberculosis (all forms) | 199 | 46 | −77 |
| 3. Diseases of the heart | 167 | 292 | +75 |
| 4. Intracranial lesion of vascular origin | 134 | 91 | −32 |
| 5. Diarrhea, enteritis, etc. | 113 | 10 | −91 |
| 6. Nephritis (all forms) | 105 | 81 | −23 |
| 7. Cancer and other malignant tumors | 80 | 120 | +50 |
| 8. Diabetes mellitus | 13 | 27 | +108 |

*a Adapted from U.S. National Office of Vital Statistics (Rogers, E.S. "Human Ecology and Health." Macmillan Co., New York, 1960. Table 56, p. 148.

*b Mortality, of course, is not a good measure of prevalence of ill health in any country. Morbidity and the prevalence of chronic disease should likewise be a major consideration.

| TABLE 2 | EIGHT LEADING CAUSES OF DEATH IN THE UNITED STATES IN 1967a |
|-----------------------------|-----------------------------------------------|
| Rank | Disease | Death rate per 100,000 | Percentage change since 1940b |
| 1 | Heart diseases | 364.3 | +24.7 |
| 2 | Cancer | 157.2 | +31 |
| 3 | Stroke (vascular lesions) | 102.2 | +12.3 |
| 4 | Accidents (motor vehicles) (all other) | 57.2 (26.7) (30.4) | |
| 5 | Influenza and pneumonia | 28.8 | −60 |
| 6 | Certain diseases of early infancy | 24.4 | |
| 7 | Arteriosclerosis | 19.0 | |
| 8 | Diabetes mellitus | 17.7 | +36 |

*a Source: Vital statistics of the United States, 1967.

*b Changes based on figures recorded in Table 1. An increase in non-infectious disease which had come about in a period of 27 years is reflected in the above Table.
The AES actually faced conditions which were changing with kaleidoscopic rapidity. Such conditions had been brought on in part by the population explosion which, indeed, has tremendous epidemiological overtones. In order for the Society to keep abreast of changing disease patterns, the complexion of its membership changed accordingly. Inevitably, it became increasingly heterogeneous in makeup—a far cry from the earlier microbiologically inclined epidemiologists who formed a compact club with a common interest among themselves.

For some members of the AES, the creeds and methods that had been laboriously learned in the 1920s and before, were such that the introduction of the subject of noninfectious diseases was just too difficult to absorb. For others, this was decidedly not the case. Their beliefs and methods were in tune with the day and they took this timely change in stride.

Already, thoughtful physicians had of necessity been obliged to recognize differences in the types of patients that came to them, and had begun to look at their new responsibilities from a more ecological point of view. It was a feature that again brought clinicians and epidemiologists together. Indeed, for a while, academic clinicians, it would seem, had forged ahead of some of the more recalcitrant epidemiologists. The latter could perhaps have made greater use of their experience sooner in studying the epidemiological aspects of the social diseases which were springing up all around them.

But, epidemiologists soon caught up and entered upon a period when a more penetrating look was taken at the intimate background of patients or subjects, i.e., they paid more attention to the micro-climate. This included ways of living—socio-economic factors, familial and domiciliary conditions. Epidemiological approaches could now be used to advantage in delving much deeper into the manner in which ill health affected the component elements of both the advantaged or less advantaged members of a given population. New and more sophisticated methods had been introduced to cope with this much broader field. Such methods at first included more extensive use of punch cards, and later came the computer. By this means a great mass of clinical and environmental observations, coupled with serological and other tests, could be correlated and put to effective use; and most of all, quick data retrieval was achieved.

The forward-looking manner in which the Society dealt with the epidemiology of cancer was of more than passing interest. The first paper dealing with this subject, which was presented at a meeting in 1929, could be justly considered a pioneer in the field. But in due time the epidemiology of various forms of cancer was brought up frequently in isolated presentations during subsequent years.

Although a relationship between cigarette smoking and cancer of the lung had been suggested many times, it was not until 1950 when Robert Doll and A. Bradford Hill in England made their preliminary report of a large-scale epidemiological study that the relationship between these two factors was put on a sounder basis (3). In the United States at this time, Wynder and Graham, and Hammond and Horn reported similar observations. Doll and Hill then conducted an extensive investigation of carcinoma of the lung in British physicians that resulted in an authoritative paper on the subject by these same two British authors in 1956.

The stumbling block that made some eminent pathologists and clinicians repugnant to the whole idea of such an association, was that the conclusion had been reached by epidemiological methods; not by methods which they themselves had devised or were even familiar with.
But during the 1950s, when skepticism regarding smoking and lung cancer was rife throughout the rank and file of American physicians and especially the American public, it is heartening to find that a paper on such a possible causal connection appeared on the program of the AES as early as April 1953. It was given by Morton L. Levin of the Roswell Park Research Institute of Buffalo. The same author made another timely presentation on the same subject before the Society in 1955. Many of the doubters among the medical profession who refused to believe in this relationship were also reputable scientists who seemed to have had little or no training or experience in epidemiology; and, as a result did not consider that anything should or could be proven by biostatistical methods.

In another prominent field, the multifactorial causes of ischemic heart disease (IHD) and other lesions due to atherosclerosis received increasing attention. This was to become an important and controversial field of endeavor in the next decade when many retrospective and prospective surveys on IHD were initiated. These dealt with analyses of: high levels of animal fat in the diet which, in turn, led to high cholesterol or high triglyceride levels in the blood, lack of regular exercise, the drinking of hard or soft water, excessive cigarette smoking, premature elevation of blood pressure, the presence of diabetes, weight-gain at an early age, and other features that were considered relevant. Such contributing causes should have been enough to keep epidemiologists busy for half a century.

An early international study on this subject was presented to the Society by Ancel Keyes and his colleagues of the University of Minnesota, at the annual AES meeting held in Toronto, in 1959. The paper had to do with the relationship of blood cholesterol levels and the occurrence of ischemic heart disease in a number of dissimilar populations. Keyes et al. also described results of analyses of various series of electrocardiograms which had been performed on members of populations living in different countries and having different sociological and dietary habits. In other words, the study was concerned with possible influences on IHD of the ways of living in affluent societies contrasted with those which were less affluent. It was a forerunner of a host of surveys on municipal, industrial, national, and international populations, which were made in the years to come and still are in the making.

In this same period there was a beginning recognition that congenital aspects of disease deserved a prominent place in the field of epidemiology. The Society was fortunate in numbering Theodore H. Ingalls among its membership, and indeed, as its president in 1968. Dr. Ingalls, even before he had become an AES member had shared (with John E. Gordon in 1947) in the authorship of a paper on the “Implications of developmental arrests.” Subsequently, beginning in 1953, he gave a series of presentations on the “Experimental epidemiology of congenital anomalies.” Shortly thereafter, the subject of medical genetics become recognized in the medical schools of this country, as an increasingly important branch of the medical sciences.

Coincident with these changing times and interests an inevitable shift came in the composition of the membership of the AES, which in itself was bound to exert an influence on some of the Society’s aims. Thus, a decline had come about in the relative percentage of health officers and a rise in more academic and clinically minded members (see Table 3 and Fig. 9). This has been due to the increase in newly created departments of Preventive Medicine or their equivalents in the medical schools of the United States and Canada.
### TABLE 3

**Composition of Membership of The AES, 1928–1969**

| Categories                                         | 1928 | 1947 | 1951 | 1954 | 1956 | 1961 | 1963 | 1967 | 1969 |
|----------------------------------------------------|------|------|------|------|------|------|------|------|------|
| Total active membership                            | 33   | 79   | 78   | 81   | 92   | 102  | 111  | 113  | 127  |
| Schools of public health (faculty positions)       | 21.2 | 25.1 | 30.8 | 29.6 | 29.2 | 26.4 | 27.0 | 20.2 | 21.3 |
| Departments of preventive medicine and others in medical schools. (faculty positions) | 12.0 | 10.2 | 17.9 | 16.1 | 16.4 | 13.5 | 16.3 | 25.3 | 26.5 |
| Health officers                                    | 27.1 | 19.3 | 12.6 | 12.4 | 13.1 | 9.8  | 9.0  | 8.0  | 5.5  |
| Research institutes (staff members of)             | 21.2 | 19.3 | 12.6 | 12.4 | 14.1 | 27.4 | 27.0 | 23.9 | 23.7 |
| Essentially administrational and others<sup>a</sup> | 6.0  | 15.2 | 12.6 | 14.9 | 17.3 | 12.6 | 14.4 | 15.0 | 15.7 |
| Statisticians<sup>b</sup>                          | 3.0  | 3.0  | 2.6  | 5.1  | 2.2  | 2.9  | 4.5  | 2.7  | 2.4  |
| Armed forces—research and administrative positions | 0.0  | 5.0  | 2.6  | 3.7  | 3.3  | 2.9  | 1.8  | 0.8  | 0.8  |
| Microbiologists                                    | 3.0  | 3.8  | 7.7  | 6.2  | 4.3  | 3.9  | 2.7  | 1.8  | 2.4  |

<sup>a</sup> Such positions were usually occupied by members nearing the retiring age.

<sup>b</sup> Unattached to a school of public health.

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**Fig. 9.** Representative categories into which membership of the AES fell (1927–69).

It was during this period when the Society felt that it could profit by adding those candidates to its membership who were young, gave promise of investigative activity, and were likely to have a long career in teaching. This was to the detriment of those candidates who represented professional health officers and was reflected,
in the words of Dr. R. F. Korns (an ex-secretary of the Society). He was one who represented that minority category of fast disappearing health officers as active members in the AES. In June 1969, he wrote:

Since my own professional career has been tied to a State Health Department, I wondered to what extent our present membership, both active and emeritus, reflected ties with either State or local Health Departments. From the 1968 membership list and supplements issued subsequently I note that only 5 members are in some way tied to these health agencies and I am not sure of the present status of all of these . . . I am not sure why I comment on this facet of our membership structure except to emphasize that the complexion of official agencies, certainly at the state and local levels, has changed radically over the years. We are now in the business of organizing the delivery of medical care and in cleaning up the environment (water, air, pesticides, etc.) without expressing much concern about establishing a firm epidemiological basis for these control programs (4).

A glance at Table 3 will reveal that during the past 15 years, coincident with a decline in the percentage of health officers as members of the AES, there had been a sharp rise in the percentage of academic members who had been recruited from medical schools. These had increased sharply, due to the increased opportuni-

| TABLE 4 |
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| **TITLES OF PAPERS DELIVERED BEFORE THE AES DURING EIGHT 5-YEAR PERIODS (1927–1967)** |
| Subjects | Meeting No.'s. |
| --- | --- |
| Subjects | 1927–1932 | 1933–1938 | 1939–1944 | 1945–1950 | 1951–1956 | 1957–1962 | 1963–1968 | 1969–1974 |
| Acute infectious diseases | | | | | | | | |
| (A) Bacterial | 8 | 4 | 8 | 6 | 7 | 2 | 4 | 2 |
| (B) Viral and rickettsial | 14 | 6 | 8 | 18 | 12 | 9 | 20 | 17 |
| (C) Parasitic infestations, malaria, etc. | 1 | 2 | 1 | 3 | 2 | 4 | 2 | 1 |
| Chronic infections, including tuberculosis and syphilis | 2 | 6 | 11 | 7 | 5 | 4 | 1 | 2 |
| Prevalence data, immunologic surveys, trials of therapy and prophylaxis | 18 | 9 | 4 | 9 | 8 | 13 | 8 | 13 |
| Experimental epidemiology | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total studies on infections. | 46 | 27 | 32 | 43 | 34 | 32 | 35 | 35 |
| Noninfectious diseases | | | | | | | | |
| (A) Cancer | 1 | 1 | 1 | 0 | 1 | 2 | 5 | 4 |
| (B) Nutritional disease | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| (C) Congenital and genetic disorders | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 3 |
| Other noninfectious, cardiovascular, accidents, etc. | 0 | 0 | 1 | 0 | 5 | 11 | 12 | 12 |
| Total noninfectious conditions | 1 | 1 | 2 | 2 | 7 | 15 | 20 | 19 |
| Diseases of unknown etiology: Measurement in epidemiology: stochastic methods, etc. | 0 | 2 | 0 | 0 | 0 | 4 | 1 | 0 |
| Reviews: historical and theoretical | 0 | 0 | 1 | 0 | 2 | 3 | 3 | 4 |
| Total | 1 | 3 | 4 | 0 | 1 | 4 | 3 | 4 |

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ties of research positions in epidemiology which were supported mostly by the NIH or the CDC.

Throughout these changing times the number of members from the faculties of Schools of Public Health maintained a steadfast position. They kept in charge of the situation, as indeed should have been the case.

The subject matter of the presentations at the annual meetings of the AES inevitably and automically underwent a certain amount of change too. In order to follow these trends the titles of the papers presented at 44 of the meetings of the AES are listed in the Appendix of this volume; and a grouping of them, according to subject matter, appears in abbreviated form in Table 4 and Fig. 10. The pattern reflects a crude trend, illustrating the manner in which this Society has kept abreast of the times.

In the preparation of Table 4, ambiguities in the titles have inevitably made for difficulties in classification, especially when the author of a given paper was attempting to expound two or three things. But, by and large, the interest and intent of the respective authors was evident. There also are a number of other variables which should be taken into account in the interpretation of Table 4 and Fig. 10. In its first years (1927–32), the Society held two meetings a year and this, in part, might seem to have caused an undue concentration of papers dealing with infectious disease during those early years.

Undoubtedly, World War II exerted pressure on the Society to present more papers on infections, common (or even rare), to military personnel. Many of its members had participated in field studies on vaccine trials which had been carried out under the auspices of the Army Epidemiological Board and there was a certain
amount of urgency that they should receive the critical discussion for which the AES was famous. Indeed, interest in these subjects had reached such a pitch that it did not decline with the end of the war.

Also, with the postwar years came some new discoveries in the field of virus diseases: adenoviruses, arboviruses, the Coxsackie and echoviruses, and the exciting questions of how best to immunize against poliomyelitis, dengue, measles, and rubella. In any event, the number of papers on infectious diseases has shown little, if any signs of slackening off during the entire history of the Society. But, when interest in noninfectious conditions had so greatly increased in the second half of the twentieth century and their rates had climbed so strikingly that they could no longer be overlooked, space was found for dealing with these subjects, not by cutting down on the number of papers dealing with infectious disease, but by increasing the length of the meetings from 1 to 1½ days. By this move, the Society enormously enhanced its usefulness and timeliness when it recognized the upsurge of "new" diseases which the western world was facing (see Fig. 10). Such subjects represented a whole array of problems attributable to modern and changing ways of life.

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4. Letter to the author from R. F. Korns, June 16, 1969.