APPENDIX D
Selected References


J. F. Lakey, Association of Food & Drug Officials of the U. S. Appraisal Of The Safety Of Chemicals In Foods, Drugs, And Cosmetics, Texas State Department of Health, Austin 1, Texas.

ENVIRONMENTAL HEALTH—TODAY AND TOMORROW

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It is particularly fitting that in its 50th anniversary meeting, the International Association of Milk and Food Sanitarians would take stock of the present status of environmental health. But it is even more gratifying to observe that rather than to review past decades of notable effort, you are eager to look ahead and to plan for the needs of tomorrow. Admittedly this is a difficult assignment because environmental health is related to social development as well as to physical conditions, and to some extent both of these factors are unpredictable. Of one thing we can be certain — environmental health problems will become more varied and more complex and the public more demanding.

Environmental health programs of the past five decades have largely reflected the application of knowledge that became available through the golden era of bacteriology. The identification of the typhoid bacillus in 1880 was soon followed by the general development of water treatment plants in the early 1900's. Concern over poor home sewage disposal practices led to the development of the sanitary privy and this is said to have been one of the factors that led to the organization of the county health department movement beginning at about 1910. It was in the fruitful first decade of this century that a few visionary pioneers in food and milk sanitation met together and later formed the organization that is meeting here today. The efforts of these early sanitarians have been basic to the remarkable conservation of life that has occurred since 1900. However, health workers are now aware that environmental health programs must embrace significantly broadened responsibilities because of the changing dimensions of our national life.

Often do the spirits of great events stride on before the events, and in today already walks tomorrow.
—Schiller

There are many changes that exert pressure on environmental health programs today. Consider, for example, the following influences.

1. Population expansion and movement is by far the most significant development of this century. In 1900 the United States population was 76 million; in September 1963, it reached 190 million. In 1900, 40% of the population was urban; in 1963 70% lived in urban areas. The movement of population from rural to urban areas continues. Within metropolitan areas a reverse phenomena is seen and as a result the suburban fringe may extend outward from central core cities as far as 30 to 50 miles. In the United States there are today 210 standard metropolitan areas of which 27 embrace parts of two or more states.

2. Changing technology has greatly broadened the exposure to processes and substances either known to be injurious to health, or in many cases to involve completely unknown risks. The past 25 years have seen tremendous growth in the chemical industry which has given birth in this short time to such commonplace items as synthetic rubbers, detergents, synthetic fibers such as nylon and orlon, herbicides and

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pesticides, plus a wide variety of plastic compounds. Modern technology has made wide use of radioactive chemicals and energy from radioactive sources is commercially feasible. Recent interest in lasers and masers illustrate the rapidity with which entirely new energy forms emerge from the research laboratory and soon become industrial processes.

3. Increased social consciousness has become evident as a part of public policy in the United States. Public housing programs to provide acceptable low cost housing began modestly in 1935. In 1959 expenditures from tax sources for this purpose reached 158 million dollars, at which time there were 594,000 dwelling units of public housing available or under construction. But in the census the following year, 18.8% of all housing units in the United States were adjudged dilapidated or lacking one or more plumbing facilities.

4. Increased concern with the conservation of natural resources has focussed attention upon the problems of air and water pollution. The dramatic consequences of polluted air are widely known—the Donora disaster, the London fogs associated with smoke, Los Angeles and its smog alerts. But there is also increasing concern with sub-clinical effects and their possible long term relationship to emphysema and pulmonary cancers.

The nature of the problem of water resources conservation is also becoming better known. Essentially it involves the quantity and quality of water available for industrial and community use. Whereas originally water pollution was chiefly related to domestic sewage and the solution was obtained by relatively simple treatment processes, today's pollution problems frequently involve complex chemicals, some of which are radioactive. Often the treatment plant processes do not alter the chemicals present in the sewage. Then, too, the sheer volume of sewage presented by a large metropolitan treatment plant results in heavy loading of the receiving stream even when the most efficient methods of treatment are employed.

5. New dimensions of old public health programs require further study. Even our traditional environmental health activities are undergoing change. Typically the processing and distribution of milk has changed from a family operation to a major industry with the product moving out of the plant and into a distribution area that may embrace several counties or even two or more states. Nearly all the market milk is now pasteurized. Public health concern, in turn, has broadened to include distribution practices, shelf life, nutritional quality, and possible chemical additives. Similarly in the traditional food sanitation program, concern resided with the enforcement of restaurant sanitation standards. Today's program embraces the sanitation of food processing plants, vending equipment, and frozen foods. The sanitarian is also alert to the possibility of foreign chemicals in the food supply, and he must safeguard foods from viral and bacterial agents.

Even the traditional concern of the sanitarian with sewage disposal has been modernized. The pit privy has long since been replaced by the ubiquitous septic tank. In the 15 years, from 1945 to 1960, the population in metropolitan areas served by septic tanks has quadrupled to a figure of 23 million and the end is not yet in sight. Although no figures are available, many metropolitan area health officials would agree that more citizen complaints originate from poor sewage disposal practices than any other single source.

6. Environmental planning is the final area of the changing order about which comment should be made at this time. The interest of the community planner in environmental factors is readily understandable. The interest of public health and planning merge as each profession seeks to insure an environment conducive to comfortable living. Wise decisions made today by the public health oriented planning official will help to avoid problems that may otherwise plague the community for a lifetime, as for example, through the proper planning for community facilities, the location of industrial parks to minimize air pollution and noise problems, the provision of waste disposal sites, the preservation of open spaces for recreational purposes, and the design of modern road systems to minimize driving hazards.

This review of trends and community expectations in the area of environmental health is neither original nor new. But it is essential that these components be recognized because they will shape the face of environmental health in the future. Since they represent potential problems, and express community needs, sooner or later citizens will seek answers to these problems. If our present local health organizations and our present staffs cannot cope with these problems, it is safe to predict they will not long be retained.

In this series of papers the speakers have emphasized various aspects of the communication process. Today it is essential that public health engage in two types of communication—first, searching intra-professional study; second, candid discussion with the various publics with which we are concerned.

Within our professional framework, both in voluntary associations and within organized health departments, the following activities are in order:

1. The environmental health problems that are of significance in terms of present day thinking must be identified. Traditional program practice can no
longer be a guide to the progressive administrator. A questioning attitude toward traditional procedures may well lead to changes that will provide personnel for activities of greater importance. But of even more significance, failure to act will only result in the creation of new agencies prepared to provide services that are needed in the community today.

2. The environmental health services available at the level of local government must be strengthened. It is an unpleasant fact that local health departments have not proliferated rapidly in the past two decades, despite the fact that many of the problems previously mentioned are post-war phenomena. In this circumstance, it should be incumbent upon public health officials to improvise and demonstrate new patterns of organization in order to attack those community health needs that are present. Environmental health problems are tangible, readily recognized as community obligations, and programs to cope with these problems can be “sold” to the public.

3. Responsibility for environmental health services should be delegated to the level of governmental authority closest to the population to be served, providing that proper legal authorization and competent supervision of personnel can be assured. On one hand, the present pattern of organization for local health services has tended in many instances to proliferate small jurisdictions in which it is difficult to recruit competent and trained personnel. At the same time there is often reluctance on the part of state authorities to delegate responsibility to local jurisdictions. Combination of jurisdictions into larger units is one method by which sufficient resources could be obtained to enable the employment of trained and specialized personnel with necessary supporting services. In turn, increased competence and availability of prepared staff members would enable local health units to attack modern environmental health problems more vigorously.

4. Training opportunities for the environmental health sciences should be promoted. The modern environmental health program can and must utilize various levels of trained personnel, with a variety of technical backgrounds. Supervising personnel undoubtedly will require post graduate training in engineering, sanitary science, or related disciplines. Staff level assignments are performed by personnel from many disciplines, some with and some without baccalaureate preparation. A continued staff education program is essential for all employees. Good administrative practice requires that job assignments be made with full recognition of the level of training required to perform the work assignment. Only the exceptional department will be able to employ every type of specialized personnel required. However, more use should be made of consultants; part time employees and jointly employed personnel should also be considered when feasible.

5. Research opportunities should be encouraged at the level of local operations. The recognition that significant types of original investigation can be performed in operating agencies would have several beneficial efforts. The practical application of new methods of operation could be determined more quickly. It would also provide greater stimulation for trained personnel to remain in the field level departments. Certainly the knowledge that research activity was carried out would enhance the esteem of the department in the community.

6. Environmental health workers must continue to cultivate a broad professional outlook. The study and control of environmental hazards involves many disciplines working together and the staff worker must have knowledge as to the basic principles and techniques used by the various related disciplines. Often problems requiring the cooperation of other members of the public health team, not associated with the environmental health unit, will be encountered and appropriate referrals must be initiated. Finally, as a professional worker in an increasingly complex society, the environmental health consultant must be sufficiently versed in the social sciences in order to apply his specialized knowledge effectively.

This series of recommendations regarding the strengthening of local environmental health services is inter-related. Program, organization, personnel, training, and motivation are facets of a single structure. Although a beginning can be made at any point, the other aspects must soon be examined.

The modern environmental health program is carried out in a highly organized social structure. Although “health” and “safety” are regarded by public health workers as prime values, to the citizen, the business man, or the political scientist, they may have only a relative value, equated with taxes, profits, community fund drives, and the need for schools. In the face of these many demands for attention, the citizen is not likely to be concerned with his environmental health services unless problems occur. Good service by staff when requested by private citizens is an excellent way of creating a favorable image for the department. Often these contacts present an opportunity for voicing the department’s program interests. But conscientious service by itself is not enough.

To be effective and successful, the administrator of environmental health programs must cultivate community understanding and support. Increasingly, advisory committees are being used to provide a means of liaison with business and professional interests in the community. Such contact provides a means of sharing the department’s goals with the group that will be involved, and, in turn, provides an opportunity
for comment on problems of interpretation, compliance, and enforcement.

The use of citizen committees, and regular meetings with civic bodies such as city councils, chambers of commerce, and trade associations can also be the means for projecting public health concerns and goals.

In all of our public health activities today, it is in our professional interest to share responsibility with the community. As public health workers, we can not guarantee a healthy community unless the community is interested in accepting, demanding, and when necessary, enforcing the standards that insure good practice. In all areas of environmental health practice, we are seeking a transfer of learning, and subsequently an acceptance of responsibility for good health practice by the citizens, by industry, and by business. Our interests have broadened to include all aspects of man’s environment. More than ever before our position requires leadership and planning. Our techniques must emphasize consultation and education as well as enforcement. Thus as this association enters its second half century, it does so with the knowledge that the horizon for professional performance has never been broader, nor have the opportunities for the environmental health scientist ever been greater.

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THE MICROBIOLOGICAL SIGNIFICANCE OF FOOD PACKAGING MATERIALS

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Principal among the trademarks of an advanced society is the continuous availability to its members of a nutritionally adequate and otherwise wholesome food supply. Only in a milieu which supplies this essential to a majority of the population can we secure the not unmixed blessings of technological and cultural progress. We have achieved our high level in the maintenance and protection of public health through the devices of law and education primary to the accomplishment of the objectives of a democratic society. Attainment of the goal of adequate and safe nutrition demands a careful and continuous surveillance of our food supply from its source in the agricultural industry through each step in its inexorable march into the gullet of the ultimate consumer.

Investigations of communicable disease transmission, control of spoilage, transportation and protection of perishables, pesticide management and dozens of other facets of this engaging field provide an impressive body of literature upon which we draw to make prudent judgments and exercise adequate control. The more specialized problems which arise as new food processing and distribution techniques develop, have likewise received their share of attention. Frozen foods, vending, radiation sterilization and other mileposts in the evolution of the food industry, have generated appropriate investigations.

In this body of information one is impressed not by the scarcity of publications on food packaging which are legion, but rather by the relatively few publications of relevance to its microbiology.

THE MICROBIOLOGY OF PACKAGING

The microbiological significance of packaging resides in a very simple relationship; it is in direct contact with its food contents. Thus, if food packaging does have a microbiology, it is a priori significant, assuming our aim is to preclude exogenous organisms from food. If this is our goal it makes very little sense to exercise sanitary control over the endless details of production, processing, dispensing and handling of food while remaining indifferent to the condition of the container in which it is finally packed and presented to the consumer.

The first essential then is to establish whether packaging can make a significant microbial contribution to food i.e., does it have a meaningful microbiology? Let us look at the bacteriologically important events in the production of some common packaging materials. Perhaps the most universally employed packaging are variants of paper and paperboard. Many aspects of the complex process which converts cellulose fibers into a finished food package bear on the microbiological picture.

Beginning with the fiber slurry from which it is made, the microbial population of paper is highly variable. It may range from a few or a few hundred per gram up to hundreds of thousands, sometimes millions depending upon the type of pulp, its

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