THE WORTH AND DOMAIN OF APPLIED SANITARY SCIENCE — A RATIONALE AND A PLEA

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It is no friendly environment, this of thine — Carlyle

Great strides have been made in the control of many adverse factors of the environment since the turn of the century. However, the solution of all environmental problems facing us is far from being realized. Considered at first as an applied bacteriologic science, the meaning of environmental sanitation has been gradually broadened to include most, if not all, of the many aspects of human environment, disease provoking or not. Changing perspectives now imply not only the disease aspects and the promotion of health but other environmental factors not concerned with pathogenic microorganisms. A healthful environment now connotes not only physiologic, but psychologic, economic and sociologic values.

The modern environmental spectrum, if we may borrow from the terminology of the physicist, is comprised of a large number of factors grouped under the general fundamentals — air, water, food and shelter. More specifically, we have such man-made hazards as air and stream pollution, home, traffic and industrial accidents, harmful food additives and deficiencies, noise, radiologic and other wastes, the not too remote possibility of biological, chemical and radiologic warfare and such natural environmental hazards as allergies from air-borne spores and pollen, toxic aquatic growths and direct and indirect insect and rodent contacts. Aesthetics and nutrition are other important factors.

A forceful idea of the importance of environmental health is afforded by Bosch(1) who states that an estimated one-fifth of all the deaths in the world are due to adverse environmental conditions. Vaughan(2) believes that “Insanitation has registered more damage than enemy’s bullets in many wars and atomic war may be no exception”. The importance of proper sanitation to the armed forces, learned by bitter experience, is reflected in its mandatory practice by all commands and the conductance of incessant research programs.

Recently a number of criticisms have been directed at certain environmental practices which should not go unanswered. Furthermore, whether we like to acknowledge it or not, some segments of the public health team nurse various grievances, real or imaginary, which are not conducive to effective teamwork and should be considered. This discussion represents a constructive attempt to rationalize the subject of sanitary science in its manifold aspects.

CRITICISMS OF APPLIED SANITARY SCIENCE

Let us consider these arguments first from the standpoint of infectious disease remembering that the sincerity behind these criticisms is not questioned. The criticisms listed and discussed under this heading are voiced by Korns(3) and reflect the thinking of many medical men and surprisingly even some persons directly concerned with environmental health activities. These include, among others of perhaps minor importance, such assertions as these. The unsurge, real or apparent, in virus diseases can be laid directly at the door of applied sanitary science; for example, the present position of poliomyelitis, which is occurring more frequently today than in the past. The theory is that these changes are due to concurrent improvement in sanitary environment which prevents the acquisition of infection at an early age when the disease may be completely inapparent. Even assuming this is true, and the evidence is indirect, Korns answers this criticism very well. He states that the dropping of sanitary barriers is not necessary but rather that an effective poliomyelitis vaccine (advances are being made in this direction) be developed to immunize the population in a more scientific manner without the necessity of resorting to the sanitary practices of the Middle Ages. This trend in thinking may well be applied to other instances of this kind.

Another criticism, probably legitimate in part, is that the role of restaurant utensils with reference to prevention of disease has not been satisfactorily explored. Consequently, control through proper sanitization of utensils in restaurants is unnecessary. Perhaps the reason for the inconclusive evidence and paucity of information is that the restaurant environment is not amenable to controlled study. Reason, though not infallible, tells us that improper sanitary practices, including improper sanitization of utensils are doorways to danger. Until proven otherwise, let us take the precautions logic tells us to observe. This position is strength-
food buildup of some temporary food as well. The cabinet for other kinds of intestinal can hardly be ignored. It may be indicates the advisability of the supervision.

Though innocuous, the contaminant with fecal material. It is usually wise to out that the changing in environmental health practices may be short duration, if any is conferred at all. The shifting equilibrium between host and parasite induced through the medium of natural events or the practice of sanitary science can be turned to human advantage by learning all we can concerning the modes of transmission and by applying measures where they will do the most good even though some compromise in accepting lesser evils is dictated.

Burnet (4) observes that “The opportunities for the spread of droplet infection have in all probability been increased because of the greater size and mobility of modern city populations . . . and that . . . the extent of speed and travel between civilized countries has resulted in a more or less single closed environment in the biological sense”. The decline of some diseases in some localities because of either natural causes or control measures should not lead to complacency and the dropping of barriers to these diseases. The potential threat of biological warfare alone should increase the pace of research in applied sanitary science.

Another unfavorable reaction to applied sanitary science is that the “shot-gun” approach should be avoided in favor of a more “pin-point” control directed at specific vulnerable points. Experience tells us that either approach may be wrong depending upon the character of the problem. Sometimes the former approach will realize cumulative benefits not shown by the latter and if so the shot-gun approach is the method of choice. Critics of “shot-gun” methods in sanitary procedures are in favor of, or go along with, the “shot-gun” application of antibiotics. It must be remembered that in many situations we cannot postpone action until all the scientific answers are available.

All these considerations lead to the asking of some questions. Shall we accept death and disease based on partial or non-intervention because of death and disease in some unforseeable future? Instinctively man tries to protect himself albeit from a bullet, a disease or a fall. He seeks shelter from the cold, the heat, the rain or the brightness of the sun. He gives a wide berth to a home quarantined by disease. He may be allergic to pollen. He dreads the coming of winter and does something about it if he can. He may get indigestion from poor quality food or drink and swears he will report nuisances to the health officer. Irritations attributable to environmental stimulants leave him with an unhealthy sense of frustration. The odor of unwashed bodies in enclosed spaces irritates his sense of smell. Loud irritable noises give him the will to mayhem. And the name of all these effects is environment! Successful control of environmental hazards and annoyances leading to complete or partial compatibility between man and his environment may alleviate, minimize or eliminate a large portion of the ills that man is heir to. Perhaps, all things considered, sanitary science does not properly belong to the medical sciences at all since much more is at stake than the modern medical concept of health.

The Policy of Laissez Faire

One of the major premises of the proponents of the laissez faire (leave well enough alone) policy is the assumption that absolute control of all harmful organisms can be readily achieved. Even if the habits, identity, sources and modes of transmission of all harmful organisms are known, absolute elimination is another matter. True, typhoid can be controlled, water rendered innocuous, milk safeguarded and food protected, completeness of control predicated on the effort, time and money expended. But the safety
achieved here is relative based on such factors as the human equation, the law of diminishing returns, the fallability of machinery and controls and the practicability involved. Of paramount importance is the fact that many processes permit the use of closed systems assuring a maximum degree of control as in the chlorination of water, pasteurization of milk and the like. Proper methods of storage and transportation also allow a reasonable degree of control. But closed-system conditions are not realized in all of the possible environmental patterns. We should also not lose sight of the contamination potential even under closed-system conditions after the process has been completed. So we conclude that in most approaches only relative safety is achieved while in others even this appears to be out of reach, at least at present. To realize the difficulties involved let us look at the various routes or pathways to infection. Thus we have the food and water-borne route, contact, airborne, vector and even an endogenous route where infection depends heavily on predisposing causes in the host. Modes of transmission determine the resultant pattern of infectivity and the more we know regarding these avenues the better able we will be to establish control measures designed to give proper balance to the control.

In many instances we have to take a calculated risk based on the principle of expediency. At times control measures may be successful but unforeseen weaknesses will develop because of the success. Under such conditions counter-measures will have to be developed to counteract these weaknesses. Therefore, of greatest importance is the sensible attitude of the environmental worker who realizes that a pathogenically sterile environment is not usually attainable and perhaps even undesirable. His efforts are therefore aimed at a minimization of potential hazard and not necessarily absolute elimination. For example, we should not lose sight of those countries where it is not so much a problem of safe food and drink but the lack thereof, and here the aim would be rendering such food and water as safe as is possible consistent with availability. So the approach to the same problem in two different situations will depend upon the conditions which prevail.

THE “TOO CLEAN” SCHOOL OF THOUGHT

In answer to the “too clean” school of thought let us pause a moment and ask ourselves how clean is clean? For example, because of its mobility liquid surfaces are relatively easy to clean. Not so solid surfaces. Here we have an extremely difficult situation. Take metallic articles for instance. The outermost layer is gas and moisture adsorbed by the dirt and dust covering the surface. The removal of dirt may be fairly simple but as the surface is newly exposed by removal of exterior dirt, adsorption layers of gases and vapors immediately form. A pure metal surface is rarely, if ever exposed. Examination of solid surfaces after cleaning, such as glass, china or plastic, by special methods will often reveal a surprising amount of foreign matter. Some recent work(5,6) utilizing radioactive tracer techniques has indicated that some types of microorganisms may be so strongly absorbed on some surfaces that normal methods of washing may remove only a small percentage. It was also found that ease of removal varies with the type of organism, type of surface as well as with the presence or absence of soil and the efficiency of the detergent process which we know also varies with the individual performing it as well as with the equipment used. Under many conditions cleaning, even though properly done, is usually followed by recontamination. Many washing operations are performed quickly and inefficiently. Greasy glasses in bars and restaurants are all too prevalent. Even vacuum cleaning in the home results in deposited dust after a presumably thorough cleaning.

Squalor and filth are still a part of the American scene. Slums still exist. Sanitary control is still largely limited to water, milk and sewage and even in these cases control is of a variable nature. Positive control is primarily a custom in cities. Rural areas have little or none. Numerous families in the United States still live in squalid surroundings. These observations coupled with such facts that millions of dwellings in the nation lack running hot and cold water, decent toilet facilities, shower or bathtub show that at community and family levels environmental health services and applications are far from satisfactory.

OVER-POPULATION AND PREVENTIVE MEDICINE

Some critics decry preventive medicine on the premise that it leads to overpopulation creating grave problems in housing, feeding and employment. Hanlon(7) suggests that if the areas barred to human use, due to prevalence of disease as in some foreign countries, were either inhabited or rendered safe for habitation, these measures would offset the problem and self-sufficiency would result. Some population experts, however, feel that, because of the constantly increasing birth rate taking place throughout the world and the United States underwriting many of the world’s underprivileged and underdeveloped areas, a crisis of the first order has been created. Bertrand Russel, famous mathematician and philosopher has observed that lives may be saved by control of epidemics making the population larger than it would be, but this would be a short range effect, and that actually the increase in population due to science is primarily because of machinery, fertilizers, improved breeds of plants resulting in increased yield per acre and yield per man-hour of labor as well as to improvements in transportation. It surely looks as if medical and sanitary science cannot be blamed as the culprits mainly responsible for overpopulation.

SOME ANSWERS

Tiedeman(8) apply some of the arguments against sanitary practices. He states that the criticism against fly control not being justified for the reason that it was originally instituted to check typhoid fever, now rapidly disappearing, is not valid as it has since been proven that fly control is effective against diarrhea to the satisfaction of the most critical
in the field of environmental sanitation leading to increased prestige and professional status commensurate with its value to society thereby attracting and holding high caliber personnel.

17. Continuously re-examine our laboratory techniques, improving existing ones, discarding the outmoded, developing new methods designed to move directly and tell us what we want to know and placing less emphasis on those which have almost outlived their usefulness.

18. And this above all, as applied scientists, to always bear in mind the proper perspective that our science is a means to an end and not an end in itself. That although we love our science our paramount dedication is to the welfare of mankind.

It is immediately acknowledged that the eighteen points listed present a formidable array of areas of activity very likely to frighten and discourage the faint-hearted but we can either take the attitude that environmental sanitation is a hopeless cause or we can grant this field of endeavor the stature which is due by utilizing time, patience, money, research and most of all the application of the traditional characteristic of the American people, if I may be excused for lassoing into the vernacular — plain unlimited guts.

To conclude, I believe that the thoughts presented herein, crystallized from the vantage point of twenty-four years of intimate contact with the manifold phases of environmental health both in the laboratory and the field, prove to me, beyond a reasonable doubt, that the worth of applied sanitary science in all its ramifications is beyond argument and that its domain is wide and varied. May I plead that we find ourselves and match the accumulating knowledge with continuous progress in environmental health toward the goal of at least alleviating the environmental miseries of man.

References

2. Vaughan, Henry F. We Can’t Stand Alone. Presented at the Annual Conference of State and Provincial Health Authorities of North America, Washington, D.C., October 23, 1950. Published by the National Sanitation Foundation.
3. Korns, Robert F. The Epidemiologist


REPORT OF THE ADVISORY COMMITTEE ON ORDINANCES AND REGULATIONS — 1954

INTRODUCTION

The Advisory Committee on Ordinances and Regulations has continued to promote uniformity. It again reiterates its belief that if we are to have the free movement of milk from surplus to deficit areas that is essential to the health of our nation and the welfare of the dairy industry, and if we are to eliminate the costly overlapping of milk inspection, we must have uniform milk ordinances uniformly enforced.

COMMENTS ON ORDINANCE REQUIREMENTS

For the past several years, this Committee has invited comments on ordinances and regulations and on the advisability of changes in ordinance requirements. This request as made in 1952 applied particularly to the Milk Ordinance and Code, 1953 Recommendations of the Public Health Service. We regret to report that no suggestions were received from the membership of the Association. However, between 20 and 30 suggestions were made relating to this ordinance by the members of the Committee. These suggestions were circulated to the Committee members and the 15 suggestions approved by the committee based on replies from not less than 5 committee members are attached as part of this report. It is requested that the secretary present these suggestions to the Public Health Service for their consideration when the ordinance is next revised. Those suggestions on which the Committee could not agree are not included as it is believed that they would accomplish no purpose. They show the difficulty encountered in obtaining unanimity of opinion regarding ordinance requirements.

FROZEN DESSERTS

At the suggestion of the Frozen Food Sanitation Committee, the Advisory Committee on Ordinances and Regulations mainly through the efforts of Mr. O. A. Chioggio has prepared suggested requirements for roadside stands dispensing frozen dairy foods. These requirements are written for frozen dairy foods which include ice cream, ice milk, sherbet, and similar products but exclude frozen products made in semblance or imitation thereof and which contain fats or oils and solids other than milk fats and milk solids. If we include frozen desserts containing fats and solids other than milk fats and solids, this defi-