

TROPICAL MEDICINE: OBLIGATIONS AND RESPONSIBILITIES*

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May I express my heartfelt appreciation for the honor you have conferred upon me. No recognition can be more satisfying than that deriving from one's colleagues.

As a consequence of events occurring ten to twenty years ago, we now find a regrettably small group of scientists active in the field of tropical medicine. This situation prevails at a time when the national interest is ever more intimately associated with the process of development of stable and healthy societies in the tropical areas of the world. Indeed, there is every reason to accept the thesis that prospects for the survival of western civilization as we know it are in large part dependent upon our ability to share the material benefits of our social system with the some two-and-a-half billion human beings who now exist in mass misery in the poorly sanitized areas of the world.

It is in this broad and, indeed, frightening and sobering context that I desire to speak tonight. Obviously we are not speaking of tropical medicine in terms of the narrow academic definition, which tends to focus on exotic disease entities. Nor are we talking of medicine in the tropics with an implied emphasis on the cure of disease in the sick individual. Rather, we are considering a continuing obligation to prevent premature death, to reduce morbidity, to control birth, and to alleviate misery. Further, we are considering the thesis that such efforts are essential ingredients of programs designed to improve the economic and social welfare of underprivileged man. While ethical considerations impel our utilization of all practical means to prevent illness, we as a group recognize an equally impelling practical and moral obligation to promote concurrent programs designed to insure opportunities for gainful employment and adequate food supplies for those who would have died but for our efforts.

Over us hangs the dark cloud of a rapidly expanding human population for which we must

accept a degree of responsibility. This responsibility will increase whenever we fail to realize that good health is but one component of a balanced program of social development, and whenever we neglect to equate the essentiality of controlling birth with that of controlling death. Yet, we must not assume a defensive posture as regards the population problem. We cannot expect acceptance of the concept of limitation of family size by those in poorly sanitized areas until by control of death we can give reasonable assurance of the survival to maturity of a reduced number of children.

Related to these considerations is our responsibility to anticipate, and to combat, the consequences of increasing population densities. Already, as a result of the development of massive urban slum aggregates—aptly termed the “septic fringes” by Fendall—it is apparent that an altered human ecology has produced an altered spectrum of disease problems as, for example, the fulminating amebiasis occurring in the urbanized Bantu in Durban, or the resurgence of urban filariasis in India. Witness the widespread distribution of venereal disease in detribalized peoples no longer under the influence of traditional mores, a development that some might relate to the suppression of yaws—but, a development that unfortunately is not completely absent from the contemporary scene in the United States! Consider the expanding spectre of schistosomiasis as the semi-arid lands are ever more converted to agricultural uses by irrigation. These are only a few examples of problems in the health field stemming from an altered human ecology that concern us at the moment.

In addition, as biologists, possessing a knowledge of ecology, we expect to experience to an ever increasing degree the Malthusian consequences of man's reproductive zeal. It may well be that food production will expand in proportion to population growth as suggested by Mayer,² and that technological advances will solve the even more critical matter of adequate water supplies. Yet, as a biologist I cannot accept the demographer's extension of present growth rates

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cited by Mayer, which indicates that in the year 2200 there will be a global population of 500 billion, a figure that would give the surface of all continents a population density equal to that presently found in Washington, D.C. Long before that time one of three contingencies will have occurred. First, hopefully, is the prospect that man may have learned to contain his reproductive capacity. However, if this hope does not materialize, then it seems certain that either the inevitable tensions arising between massed peoples of differing social and economic status will have led to virtual self-extermination by nuclear holocaust, or that mankind will have been sharply reduced in numbers as the consequence of repeated pandemics of decimating disease.

These contingencies may not affect us but certainly will face our grandchildren and succeeding generations. However, because of the exponential nature of population growth, the fate of future generations resides in our hands. The decisions taken in our lifetime that bear on the mass control of disease and of birth, and the effectiveness or lack of effectiveness with which we are able to weave our health programs into a firm fabric of economic and social progress will determine the sequence of events fifty and one hundred years from now.

In essence, this is the major task now facing mankind, one that is an intellectual challenge of the highest order, and one that can have no higher priority. The eventual solutions are not now apparent, and, if obtainable, will not derive from one group or discipline, but will slowly evolve as the distillate of the combined wisdom of the many disciplines that relate to the ecology of man. The scientist contemplating the magnitude of the task can only be humbled by its complexity, be frightened by its compelling urgency, and be frustrated by an appreciation of the extent of his personal inadequacies. He will recognize the pressing need for expanded programs of relevant research of a multidisciplinary nature, but at the same time will note that there is now at hand a sizable body of pertinent knowledge, the reasoned application of which would immeasurably improve the lot of underprivileged mankind. Reflecting, he can only wonder at the behavior of a nation that expends billions in programs for the exploration of outer space, and on the difficult task of adding ever smaller increments to the total life expectancy of its citi-

zens,—yet whose response to a major threat to its existence is limited to the creation of a kaleidoscopic succession of agencies responsible for international assistance, each conceived in an atmosphere of political expediency, and constantly subject to major changes in operational policy.

Obviously, the membership of the American Society of Tropical Medicine and Hygiene has a designated responsibility and primary interest in the welfare of the some two billion people now living in the tropical and subtropical regions of the world. Apart from the competency deriving from the technical knowledge resident in our membership, it is my belief that we share other attributes that, if properly preserved and exploited, uniquely qualify us for the major task at hand. First, we are a multidisciplinary group, accustomed to working as such and respecting professional ability and interests other than our own; such a relationship is, per se, a deterrent to the development of the scientific egocentricity now often exhibited by the scientist engaged in research of a highly specialized nature. Secondly, and importantly, our scientific heritage is basically that of classical biology. We welcome and need the contributions of the taxonomist and the information provided by those interested in life cycles and in the elucidation of the natural history of disease. Our philosophy is strongly influenced by an appreciation of the complexities inherent in the ecological approach. Basically, however, we accept the thesis that the problem before us is fundamentally one of the complex interrelationships of man with his environment.

Paradoxically, a third attribute may stem from the very fact that our area of science has not, comparatively speaking, been the beneficiary of the affluence that has befallen those concerned with fashionable research or engaged in the investigation of the "categorical diseases." Perhaps we are fortunate that those who control the national purse strings do not die of microbiology, parasitology, entomology, or sanitary engineering! To a lesser extent than some of our colleagues in other fields have we been the pawns of those administrators and their hired publicists whose primary concern at times appears to be the justification of annual budgetary increments.

A final attribute possessed by our membership may derive from the sense of foreboding that many of us share regarding some of the pro-

cedural patterns of modern research. These forebodings center around the developing intellectual snobbery that makes research an end unto itself, that divorces the researcher from responsibility for the useful application of his new found knowledge, and relegates public service and pedagogy to the status of an inferior intellectual activity. To some, research appears to be a special kind of game, with solutions to the puzzle providing an essential self-gratification. Others quite logically explore the frontiers of molecular biology sincere in their conviction that they will in the future be able to manipulate the genetic code, but being deeply immersed in this intellectual pursuit, are seemingly oblivious to possible adverse consequences of such a development and prefer to ignore the problems of mankind at the moment. Another category consists of individuals who engage in research primarily because it is a pleasant and socially acceptable means of making a livelihood, and who produce a flow of papers devoid of originality—often applying a new instrumentation to the restatement of previously established fact. It is here not necessary to further delineate the sociology of modern science for the purpose of illustrating those denigrating features against which we must guard.

Those who share this concern will find Catherine Roberts' essay,² "The Modern Biologist and Humanism," provocative and pertinent. She lists the corrupting influences in present day biological research as follows: "fundamental problems," international congresses, extravagant financial support, power and influence, fame and prestige. Her basic plea is for an infusion of a humanistic spirit and sense of values into the biologist's mental processes. She suggests such might be achieved through the practice of a credo of self-restraint, a concept she feels is best defined by the Greek word *sophrosyne*. *Sophrosyne*, Roberts indicates, has multiple meanings, implying a sane mind, practical wisdom, clear vision, right judgment, self-restraint, moderation and temperance, as well as humility, humanity, mercy, and modesty. Obviously, the task before us demands a high degree of *sophrosyne*.

As we turn to a discussion of our obligations as a Society, it is pertinent to note two addresses presented fifteen years ago before this group, which dealt with government support of research. At that time, the U. S. Public Health Service had in the post-war years made a total commit-

ment for extramural research on tropical diseases of the order of \$600,000—a sum that then seemed huge indeed. Dr. Norman Topping⁴ in his presidential address accurately prophesied, "given an expanding universe of medical research over the next few years, I would anticipate the development of an extensive array of medical research institutes—some related to universities and medical schools, some allied to hospitals, others financed and operated by private foundations and others operated by government." At the same meeting, Dr. Lowell Coggeshall⁵ explored the impact of federal funds on medical education and research. Coggeshall noted some of the potentially detrimental effects of the establishment of special institutes within the educational environment and wisely stated that "there can be no greater product of research than the discovery and development of the young scientist." In 1949, when Drs. Topping and Coggeshall addressed us, the membership of our Society numbered 969. Fifteen years later, in spite of the explosive expansion of federal support for research in the interim—from which, I believe, we have profited proportionately—we find our membership has increased but slightly to 1,175, a net increase of some 200 individuals.

At the moment, therefore, we find ourselves a relatively small group, probably possessing greater insight into the major problems facing man than our colleagues in other scientific disciplines. Our overruling objective, therefore, must be the maximal utilization of our individual and collective abilities for the common good. Several constructive courses of action appear indicated.

First, we should strive for scientific excellence at all levels of activity. We must appreciate that excellence begets excellence, much as success begets success, and that the success or failure of our efforts will be determined by the level of excellence. Further, in a period when different disciplines are in active competition for personnel, we need to appreciate that our ability to attract and to develop young scientists will be influenced not only by the excellence of our activities in the field and laboratory, but also by the collective image presented by this Society at its annual meetings and through the medium of its Journal. I feel that it is important, therefore, that we pay increasing attention to the quality and nature of our annual program. No

longer can we afford to have occasional lapses in quality; one poor paper leaves a more lasting impression than several good presentations. We need to exhibit self restraint. Too often we tend to submit material that is in the nature of an annual progress report, instead of limiting our contributions to highly significant new observations or to completed studies. Obviously, financial support for attendance at our meetings should not be equated with the acceptance of a paper. We should design our program so as to give full opportunity to the younger scientist and to feature presentations that dramatize the contributions of epidemiologic studies and of disease control programs.

We should capitalize on the inherent strength deriving from the fact that our membership extends into a variety of public and private institutions. We, therefore, have an opportunity and obligation to influence the policies and practices of these agencies. It is axiomatic that the task at hand demands the cooperative effort of all concerned. We must not permit empire-building tendencies, inter- or intra-institutional rivalries, or matters of political expediency to impede progress. We can remember, for example, in the recent past when skilled parasitologists were transformed overnight by administrative edict into overseers of polio-vaccine production. While it would serve no useful purpose to go into detail here, the mobilization of our national resources to solve the crisis posed by drug-resistant malaria, and also the implementation of the National Academy of Sciences' study of needs in tropical health, appear impeded by the cross currents now prevalent.

We have a particular responsibility to suppress influences that are disruptive of scientific collaboration. Among these, the matter of publicity occupies a prominent position. Let us grant that we have an obligation to assist in the dissemination of scientific information to the public and to assist those who labor to assure continuity of financial support for our work. Yet, as scientists we have a responsibility for the accuracy and ethical composition of public accounts of our work based on information supplied by us, whether in the lay press or in presentations to fund-granting bodies. This responsibility remains ours, and can neither be delegated to, nor usurped by, the administrator or the "public information" officer. Obviously, the instance

wherein the first announcement of a "scientific breakthrough" or a new "cure" is placed in the lay press is indefensible and needs no discussion. However, there is another practice that deserves critical assessment. I am referring to the situation wherein the scientist scheduled to present a paper arrives with lantern slides in one pocket and a mimeographed press release in the other pocket. The paper, on presentation, may elicit an adverse reception by the scientist's peers, but the press release has received no such critical review. Would we not better fulfill our responsibility for the provision of accurate information to the public by adopting a policy of delaying the news release until the scientific contribution had moved through the process of review prior to publication, and had appeared in print? I would like to suggest that the Society consider adopting such a policy, not only because it appears to be accepted ethical practice, but because it would minimize one potent source of discord.

We have touched on the need for maximum utilization of available resources. While in the area of research there are cooperative projects underway that are national and international in scope, the examples need to be multiplied. Consideration might well be given to an expansion of similar collaborative efforts in the area of education and of service. For example, in Europe representatives from the several schools or institutes of tropical medicine meet regularly to exchange information. Also, the schools at Amsterdam and at Antwerp have pooled their not inconsiderable strengths to offer a course on tropical health. We could strengthen the common effort, if schools in the United States established interrelationships designed to eliminate competitive duplication and to develop complementary areas of teaching strength to which interested students could be channeled. A logical next step would then be the establishment of closer relationships with schools abroad.

At the international level we can envision beneficial effects accruing from regular meetings by a representative group of our members with a counterpart group from the Royal Society of Tropical Medicine and Hygiene for the purpose of serious, unpublicized discussions on the mobilization of common resources, again with education and service receiving equal emphasis with research. Ways might be elaborated whereby the much needed skills of expatriate scientists and

technicians could be effectively preserved, and of more import, incipient international rivalries might be dissipated. Similar relationships might well be established with counterpart groups around the world.

The last subject that I wish to touch on concerns the matter of priorities as regards training at home and abroad, and our relationship with the developing areas of the world. In this area there is an urgent need for constructive action, which can emerge only if we have some appreciation of the errors we are now committing. Basically, we are faced with a world-wide shortage of personnel with training in the health sciences. As we attempt to narrow the existing economic and social gap between the developed and underdeveloped areas of the world, we observe that the health science gap is increasing. If we export to the developing regions either individuals or facilities that reflect the sophisticated and expensive trappings of specialized curative medicine or of fashionable research, we may widen this gap. Each time we implant an electron microscopist, an open heart surgeon, or a molecular biologist in a developing area we must realize that personnel and funds are in danger of being diverted from essential preventive programs and from the elemental curative services that are a necessary accompaniment thereof. Our ill-advised act has additional ramifications that compound the original sin, for then one of two eventualities may transpire. If our implanted emissary of modern biomedical science takes firm root, he is destined to play a dominant role in the formation of educational and operational policies that unfortunately will reflect his limited understanding of the complexities of human ecology; further, he will rapidly attract a group of students from the limited pool who will then develop in his image. On the other hand, if the implant is a native son who finds the soil barren in terms of support, his stay in his home country will be brief, and he will transplant his activities to a developed area—thus wasting the investment his people have made in his education.

There is insufficient appreciation of the extent of the problem posed by the provision of specialized training of a type not relevant to indigenous needs. The current report on education of the American Medical Association notes that in the states of New Jersey, New York, and Pennsylvania some 3,788 foreign medical gradu-

ates are in training as interns and residents; these foreign physicians constitute 38 percent of all of the house officers serving in the three states.⁶ Van Zile Hyde⁷ cites figures illustrating the problem in terms of a country such as Greece that annually graduates about 190 physicians; of these, some 95 enter the United States for training. In 1961, 59 Greek graduates were licensed in the United States, and thus, in that year we permanently absorbed into our own medical structure about one-third of the annual Greek physician-product.

Fortunately, the National Institutes of Health have recently revised regulations concerning foreign trainees and have wisely stressed the relevance of the training program as it relates to needs and job opportunities in the country of origin. This change in policy deserves and requires our support, for it is under sharp attack by those in other disciplines who as a consequence now have trouble locating trainees for their programs and look askance at the curtailment of their research operation. Extension of the revised regulations to include personnel employed under research grants appears indicated. We have an obligation within our respective institutions, and among our colleagues in the health sciences, to attempt to allocate the limited supply of manpower to those areas of endeavor deserving of highest priority.

As we plan for the future, we possess two tangible assets acquired since tropical medicine reached its nadir in the United States ten or fifteen years ago. First, we have received a considerable degree of financial support. Second, we are beginning to encounter among American medical students many whose philosophical approach to medicine is different from that of years past. These students have a genuine concern for the welfare of underprivileged man, are idealistic, plan while in medical school to develop a career in public health, and find in tropical medicine a natural and satisfying outlet for their interests. Such students, in considerable numbers and under varying auspices, now roam the tropical regions during their vacations or elective periods. They constitute an invaluable resource and will look to us for guidance only insofar as we by our actions maintain an excellence of scientific activity and exhibit *sophrosyne*.

Parenthetically, it is to be noted that the popularity of travel by students in tropical areas

poses problems *per se* that should concern us as a Society. There is a need to develop some sort of an advisory and supervisory relationship with the variety of programs that sponsor foreign travel, in order to carefully select and indoctrinate those individuals who are to be sent overseas, and to determine that they are properly distributed. Overseas host institutions, already overburdened with teaching and patient-care, are not in a position to accept trainees whose relationship is solely parasitic or even symbiotic. Our trainees will be welcomed by the overseas host institution only insofar as they do not interfere with the normal institutional metabolic process, and hopefully should be in a position to contribute to its nutrition.

In closing I would like to re-emphasize my conviction that the membership of this Society is faced with a sobering responsibility. Our effectiveness or lack of effectiveness as we strive to achieve the control of birth and of premature

death as essential prerequisites for social development will not be assessable in our lifetime. However, our successes or failures will be judged by future generations and may well determine how they live.

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