MAKING THE CONNECTION: PERSPECTIVES ON TROPICAL MEDICINE RESEARCH IN THE UNITED STATES

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Because this Presidential address is typically given at the end of one year in office, it has been likened by past Presidents of this Society to a "state-of-the-union" message. I had hoped to use my time at the 47th annual meeting to develop that analogy, to reflect on our current condition and share with you some opinions on where we as a Society need to be headed. To the great disappointment of those who had worked so hard on preparations, and all who had looked forward to an educational as well as fun-filled week in the Caribbean, the Society was forced to make the difficult decision to cancel the meeting only two weeks before it began, due to damages suffered in Puerto Rico from Hurricane Georges. This was the first time an American Society of Tropical Medicine and Hygiene (ASTMH) meeting was forced to be cancelled—a certain distinction for the outgoing President! Thanks to the efforts of our Society historian, Don Burke, we have discovered, however, that our precursor Society, the ASTM, was also forced to cancel its 1918 meeting due to the influenza pandemic that was ravaging this country at that time.

While I regret my lost opportunity to address the Society in person, I hope that the membership will take a few moments to read and reflect on this written version. I have chosen to focus on the topic I know best, which is the subject of research on tropical medicine, as conducted in the United States and by U.S. investigators overseas. I recognize that this is not the only focus of members of this Society, and I ask for the indulgence of those who are more concerned with other aspects of tropical medicine.

As I prepare this article for publication, I am pleased to report to the membership that the present state of tropical medicine research in this country is strong! In recent years we have experienced a period of tremendous promise for our field and for the members of our Society. There is an increasing recognition by those in political power of the interconnectedness of peoples around the world, an inter-connectedness that may be largely dependent on economics, but is equally manifested through international health. The nation, and the world, is now poised to think in a new light. With the public attention afforded to what are now termed "emerging and re-emerging diseases" has come an increased understanding that infectious diseases know no national boundaries. Tens of millions of Americans travel by air to parts of the world where "tropical diseases" abound. Hundreds of thousands of people cross U.S. borders each year. All of us share whatever infectious pathogens we may be carrying with our neighbors every day. For example, in 1996, the world saw the first known case of international transmission of the dreaded Ebola virus, when a physician from Gabon sought medical treatment in South Africa. Because of the public fear generated by this deadly virus, this incident rapidly gained international prominence, serving to draw attention to the fact that similar transmission of other potentially deadly pathogens occurs continually, in all directions. In 1998, an outbreak of chicken flu in Hong Kong publicly raised the specter of another influenza pandemic such as that experienced in 1918, once again hammering home the concept that health is an international concern. In addition, increasing media attention to the needs of the developing world for methods of AIDS control is bringing public understanding of the enormous dilemmas faced by health officials and care providers in countries constrained by limited resources.

As the media increasingly focuses on matters of "globalization" and international health, we have cause to hope that at last we are moving to an era in this country where, albeit from self-centered reasons, the state of health of our fellow humans around the world truly matters to all of us. The 1995 report on emerging infectious diseases of the Committee on International Science, Engineering and Technology of the National Science and Technology Council1 called for the U.S. to work in partnership with other countries to improve infectious diseases surveillance and response, as well as for enhanced U.S. capacity to combat emerging diseases through, among other things, increased training of microbiologists and physicians in tropical diseases. Following that report, through a Presidential Decision Directive known as NSTC-7, President Clinton formally charged federal agencies with the responsibility not only to prepare our nation to cope with international infectious disease problems, but to contribute substantially to the ability of other nations to do the same. The American Congress has likewise publicly recognized the need for broader involvement in global control of infectious diseases through a number of hearings, resulting in legislative language instructing federal agencies to address this threat. Moreover, Congress has been generous with appropriations for many of these agencies to allow the establishment of new programs to meet this need.

At the National Institutes of Health (NIH), the overall level of funding for tropical medicine research has more than doubled over the past 10 years, well exceeding the biomedical research and development price index (Figure 1). Moreover, young people continue to enter this field—in fiscal year (FY) 1997, the National Institute of Allergy and Infectious Diseases (NIAID) supported 56 new investigator grant awards and 23 individual postdoctoral fellowships in tropical medicine.

While the interest of various private foundations in tropical medicine has waxed and waned over the past two decades, the original goals that several had as they entered this field can logically be said to have been achieved to the extent that modern technologies are now being actively applied in all facets of research. At least at the scientific level, tropical diseases are no longer the great neglected diseases they once were. While the tendency for foundations to change their areas of emphasis periodically continues to create concern
Tropical Medicine Funding
NIAID

![Graph showing funding for tropical medicine research by the National Institutes of Health, over the past decade. Actual expenditures are compared to fiscal year 1987 levels adjusted to account for inflation according to the biomedical research and development price index. Data obtained from the office of Financial Management, NIAID.](image)

**Figure 1.** Funding for tropical medicine research by the National Institutes of Health, over the past decade. Actual expenditures (●) are compared to fiscal year 1987 levels adjusted to account for inflation according to the biomedical research and development price index (■). Data obtained from the office of Financial Management, NIAID.

among many in our field, American scientists are not completely bereft of partners outside the U.S. government. In FY 1995, eight U.S. philanthropic organizations reported support for research on international health (data courtesy of Dr. Joseph Cook, The Edna McConnell Clark Foundation). Perhaps particularly noteworthy in this regard is the contribution through the years which such organizations have made to the training of young scientists through support of the annual Biology of Parasitism course at the Marine Biological Laboratory in Woods Hole, Massachusetts, which is almost unique in the field of infectious diseases.

There is certainly no better example of the recent renaissance of tropical disease research, or the altruistic potential of research funding, than malaria. Five years ago, an international audit conducted by the Wellcome Trust revealed that the entire global contribution to research on malaria amounted to only $84 million. In 1995, a group of international research funders came together to form a consortium focused on malaria and aimed at strengthening research capacity within Africa. Independently, and as a partner in this international effort that became known as the Multinational Initiative on Malaria, NIAID has almost doubled its funding of malaria research since 1993. Other funders have likewise increased their efforts. The World Health Organization (WHO) has elected a dynamic new leader who has promised to make malaria control a top priority. The World Bank, in conjunction with WHO-AFRO, has embarked on a major new initiative to control malaria in Africa. At their Birmingham summit in April 1998, the leaders of the G-8 nations pledged themselves to a shared international effort to enhance mutual cooperation on infectious and parasitic diseases, particularly malaria as well as AIDS, as one way to enable the poorer developing countries to develop their capacities and better integrate themselves into the global economy. It is somewhat mind-boggling to contemplate that for even a brief time, the leaders of the world’s major economies came together to think about the underpoliticized problems of malaria and other parasitic diseases. While we may understand the international political and economic forces that play into such a pledge, there is no doubt that any follow-through could have the potential for real humanitarian impact.

So I repeat my message that the state of this field is strong and the opportunities for continued growth are great. This is not the time, however, to fall into a false sense of complacency. The challenge we face as a Society may well be one of the greatest yet—how to take maximal advantage of this remarkable window of opportunity to stabilize the future of tropical disease research. Because, like all things political, this opportunity need not last. While the U.S. economy was strong over the past year, our country could afford to be outward-looking. Even as our economy suffers from effects of economic downturns in other parts of the world, the American public has been bombarded by the concept of “globalization”. This is the time to make the connections that will sustain tropical medicine research into the next century. Why is this Society so vital to that cause? Because the ASTMH has been, is, and likely will remain the principal voice for tropical medicine research within this country.

In 1920, Henry J. Nichols delivered the Presidential Address to the 16th meeting of the American Society of Tropical Medicine in New Orleans.2 He gave the membership a charge that has stood the test of time when he stated: “...it is peculiarly true to the worker in tropical medicine that he must be prepared to stand on his own feet scientifically and morally.” As members of this Society today, we must be ready to stand on our own feet today just as then. It is up to our membership to advertise both the scientific vitality of our field and its integral role in international health. In pursuit of that responsibility, I propose to you three connections that I believe the members of this Society must be prepared to make to ensure the future of our field: 1) The connection between tropical disease research and the remainder of biomedical science, 2) The connection between the ASTMH and its scientific constituency, and 3) The connection between the ASTMH and the public constituency.

**The Connection Between Tropical Disease Research and the Rest of Biomedical Science**

Hopefully, I have convinced you that our field is generally strong. It is time for us to realize that and feel good about ourselves. No good purpose is served by perpetuating the image of a neglected scientific backwater—this has the potential to become a self-fulfilling prophesy. It provides no incentive to young people to enter this field, to deans to encourage tropical medicine research at their institutions, or to future funders to help us realize our full potential. The scientific advances in tropical medicine research in recent years have been spectacular. To list but a few, it is predicted that within another year we will have access to the entire sequence of genes in Plasmodium falciparum, and sequencing projects are ongoing for several other parasites (including other species of malaria, Leishmania, trypanosomes, Giardia, Toxoplasma, and Cryptosporidium). Transfection has not only been achieved in protozoan parasites but also in mosquitoes. These and other advances in molecular biology offer incredible promise for the discovery of novel methods for disease control. In addition, for more than a
decade, parasitology has been at the forefront of innovative applied research on both cytokine function and vaccine development. Tropical medicine research can compete, and tropical medicine research can get funded. Tropical disease researchers are making important contributions as faculty members in clinically oriented departments as well as basic science departments across this country. We need to talk up tropical disease research among our peers as the exciting, vibrant, intellectually stimulating field that it is. We need to invigorate our students with the sense of fulfillment that can come from making a contribution toward the ultimate goal of controlling diseases that cause such physical, emotional, and economic damage to so much of the world’s population.

THE CONNECTION BETWEEN ASTMH AND ITS SCIENTIFIC CONSTITUENCY

Every U.S. scientist who works on a pathogen that causes a tropical disease should be a member of this Society! I personally know far too many people who work on parasitic systems but consider themselves to be immunologists, biochemists, cell biologists, etc., with loyalty to the respective discipline-oriented professional organization. To them I say—if you care about tropical diseases, for humanitarian reasons or simply because you wish to continue to conduct your research on a particular tropical disease pathogen because of personal intellectual curiosity, you must belong to the ASTMH. Why? Let me say it again—this Society is the major proponent for tropical medicine research in the U.S. Several years ago, amid some controversy, this Society embraced a more activist role in support of tropical medicine research in this country. In that capacity, it has in many instances stood as the sole public voice in support of this field—in the face of many competing interests and priorities, and at times of severe funding constraints for research as a whole. I want to emphasize to you now that it is imperative that no member of this Society underestimates the importance of this effort, in the past and for the future! Discipline-oriented professional organizations may encourage support for their particular aspect of research, but it doesn’t matter to them whether the individual scientist is pursuing that research on a trypanosome or a turnip. If you are conducting fundamental research on a tropical disease pathogen, this Society demands your allegiance!

However, the constituency of this Society extends well beyond basic research. Anyone who has ever written a grant application or a scientific publication containing anything remotely resembling the sentence “____ is a tropical disease afflicting ____ million people worldwide”, is implicitly acknowledging that they are engaged in mission-oriented research. That sentence represents a health-related justification for your work, the implication of which is that your research is aimed, in some way, at contributing to the ultimate control of a terrible human disease.

Those who conduct research on tropical diseases are well aware of the difficulties in finding support for the development and testing of new drugs, vaccines, or other technologically challenging control strategies. Yet public sector support for research funding largely continues to be justified by this goal. Paradoxically, there often persists a “disconnect” between those engaged in fundamental research on tropical diseases and those endeavoring to put research discoveries to practice. This may be due in part to the compartmentalization of research, control and foreign assistance elements within different federal agencies, which can result in unfortunate competition for funding when in actuality talents and resources from all sectors are necessary to achieve our purpose. I am reminded of the words of Sir Ronald Ross, speaking about the future of tropical medicine in the British Medical Journal in 1909:

“Let them [medical researchers] not fall into the mistake that discovery, great or small, finished their duty; research was not a mere academical amusement consisting in the publication of elegant articles adorned with coloured plates. They had not only to teach, but to beseech, demand and command. They were apt to take too haughty a view of their scientific work, to stand above and apart from the throng of men for whom they were working. It was for them to descend, to go personally into the battle, and fight hand to hand in order to save their fellow men from grave and imminent dangers.”

We in this field must sell it, and sell it on basis of the tremendous opportunities that exist for research, for development, and for public health. Even those engaged in the most fundamental research should realize that they stand to benefit from the judicious testing, validation and application of their discoveries, as this outlet provides the ultimate justification for continued research. One of the most unique aspects of the ASTMH is that it covers all facets of tropical medicine, from basic research to application and control. Through its annual meetings and its journal, it offers members an opportunity to learn the full breadth of their field. In contrast to discipline-oriented societies, which are largely geared toward NIH- or National Science Foundation-sponsored research, the ASTMH also supports funding for other federal agencies, such as the Centers for Disease Control and Prevention and the U.S. Agency for International Development, which are equally important to our stated mission of “promoting world health by prevention and control of tropical diseases”. Moreover, other professional organizations largely fail to represent the international perspective on health that is the hallmark of our field and of the ASTMH. Thus, through its legislative activities, the ASTMH represents you in ways that are absolutely not reproduced elsewhere—ways that are vital to the future of this field!

There is strength in numbers. The larger our membership, the greater the power to make people listen. Moreover, the more funds we will have available to support training and outreach activities. It may surprise you then to know that fairly consistently some 20% of those in attendance at the annual meetings register as non-members. Even those who already belong to the Society may not fully recognize the vital role that the ASTMH plays in shaping support for tropical medicine research in this country. It is imperative to actively recruit new members from related research fields. Do not be embarrassed to thrust a membership form under the nose of a colleague!

In addition to enlisting those who currently work on traditional tropical disease pathogens, we should consider reaching out to those scientists working on other diseases that are also prominent in tropical and developing countries. With an increased emphasis on international health will come increased focus on collaborative international research.
As, for example, the resources of the AIDS research community become increasingly available for projects in developing countries, the attendant infrastructure strengthening at foreign institutions will likely have important ramifications for other areas of infectious diseases research, including traditional tropical diseases. Many, if not most, of the scientific, administrative, and ethical issues that arise in the context of international research are common to all programs, be they focused on acute respiratory infections, AIDS or malaria. As the only U.S. biomedical society with an historically international perspective, the membership of the ASTMH will necessarily be involved in considering and responding to these issues in the future. The Society should embrace membership by others in the infectious disease community with similar perspectives and concerns, thus ensuring a strong national voice for these viewpoints.

THE CONNECTION BETWEEN ASTMH AND THE PUBLIC CONSTITUENCY

Our Society must take advantage of this window of opportunity to convince the American public of the practical utility of tropical medicine research. When I took over as President of this Society last year, I received a compendium of past presidential addresses. I was staggered to see how many times in the history of the ASTMH the theme of the presidential address was the need for improved public understanding of the necessity for America to play a greater role in international health. Arguing from the perspective of “enlightened self-interest” for an expanded U.S. role in global health, in his 1939 presidential address to this Society, Alfred Reed noted that “tropical medicine is of such crucial social and economic importance for the future of the United States that research must become a matter of public and community recognition.” Similarly, in his 1954 address, Frederick Brady noted that “economic and social development of friendly nations is recognized as a prerequisite to the maintenance of world peace and security. Such development includes the control of debilitating diseases that waste human resources.” James Stevens Simmons effectively predicted the emerging disease threat when he told a 1946 audience that “throughout the ages the tropics have constantly predicted the emerging disease threat when he told a 1946 waste human resources.”

Unfortunately, my friends, in the overall scheme of things it does little good for us to continue to tell each other these things at our annual meetings. This is called “preaching to the choir.” If we are to secure a place for tropical medicine research in the next century, we must obtain broad understanding and support from the U.S. public and policy-makers.

Some of you may be aware of a new report produced recently by the U.S. Institute of Medicine. This congressionally mandated report, entitled “Scientific Opportunities and Public Needs: Improving Priority Setting and Public Input at the National Institutes of Health”, found that NIH decision making would be improved by giving the public more say in the process, and called for increased communication between NIH and its constituency groups with regard to funding priorities. The report further defined constituencies as: research scientists in universities and other research institutions; clinicians who apply research results; organized voluntary groups and individuals active in advocating for those with specific diseases or conditions; organizations and individuals who represent population groups with special health problems; Congress; and, the media. For better or worse, increased interactions of this sort may well be the wave of the future. We are all aware of how powerful such a message from public activists can be. That being the case, I ask you who will speak for the public health needs of the developing world? The ASTMH must be a major force in carrying that message forward. We represent both the first and second constituency on that list. Therefore, I say again, it is imperative that we as a Society are as strong and energetic a presence as possible. At this time, however, tropical medicine research is virtually lacking the third or fourth constituency in this country. We must do a better job of involving the American public (both lay organizations and individuals) in the cause of global health. One of the stated goals of this Society is “To educate health professionals and the public regarding tropical medicine.” We currently have a potential ally in this cause—the Center for the Study of Responsive Law. To have a person with Ralph Nader’s public recognition backing the cause of health as a basic worldwide human right is an unprecedented opportunity for our field. The members of this Society should be as supportive as possible of the efforts of lay groups such as this. We should be eager to work with them to provide scientific expertise. We should take the opportunity to learn from them how to improve our own nascent efforts at public outreach and education. A couple of years ago, our Society started a program to provide educational materials and promote public awareness of tropical diseases, promising to develop modules for teaching purposes. That program has languished due to lack of participation from our membership, and consists today of only a website cross-referencing information available from other sites. I strongly encourage you to get on board with this program and work to strengthen the public outreach efforts of our Society.

Championing the cause of tropical medicine research in this country has never been easy in the face of so many competing priorities. Right now, as our leaders are recognizing and adjusting to the increased globalization of world economies, and beginning to understand and cope with the resultant internationalization of health problems, it happens to be one of the most optimistic times for this effort in recent history. I know the tendency in this situation is for us all to go back to our laboratories and offices to give our full attention to our science. That is, of course, essential to our cause—outstanding competitive science is the cornerstone of our field, and will carry us into the next century. I say to you now, however, that is not enough and it will probably never be enough again. We are not just scientists, we are the voice of our field in this country. In that sense, we represent
the right of peoples of the developing world to live healthy and productive lives. Most of you are familiar with a 1997 report entitled “America’s Vital Interest in Global Health”, from the Board on International Health of the U.S. Institute of Medicine. That report recommended that this country should engage more actively in global health activities for a number of reasons, including the fulfillment of our humanitarian tradition, the protection of our people, the enhancement of our economy, and the advancement of our national interests. It also related the results of a poll, which found that a majority of Americans support foreign assistance that is directed toward helping the needy and promoting self-reliance. Self-reliance is a principle to which the American people continue to cling, and good health is its natural prerequisite. Americans know this from their own experience.

My parents grew up in the early part of this century in one of the poorest regions of the American South. My personal connection to that place and time is consolidated in one surviving boyhood picture of my father, with his many siblings and parents, standing barefoot before a ramshackle farm house. I believe this picture must have been taken about 1910, around the time of the initiation of the hookworm eradication program as well as the establishment of Public Health Service field stations for malaria control in Arkansas and Mississippi. For me, that recollection of my father’s youth provides a direct link between myself and the millions of children living under conditions of extreme poverty in developing countries today. Early in 1997, the Franklin Delano Roosevelt Memorial was opened in Washington, DC, and being locals, my family and I went to visit it shortly thereafter. As I was walking along through that memorial, pointing out to our two daughters the statue of the men in a bread line during the Great Depression and that of a man listening to one of Roosevelt’s famous fireside chats, I was reminded of the many things this President did to bring poor rural families such as mine into the 20th century. I remember coming upon a wall bearing a quote from Mr. Roosevelt, attributed to his second inaugural address in 1937—a mere 60 years ago. The inscription said:

“I see one-third of a nation ill-housed, ill-clad and ill-nourished. The test of our progress is not whether we add more to the abundance of those who have much; it is whether we provide enough for those who have too little.”

This is a message that I believe every member of this Society would embrace, and it is the connection I would like to see this Society make with the people of our country. Our nation has not come so far that it cannot look around and see its roots as a hard-scrabble developing country, rocked by drought, disease, and depression. And I believe that, understanding that connection, as a nation we will be ready to recognize the necessity of helping others overcome similar burdens as we begin the 21st century.

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REFERENCES