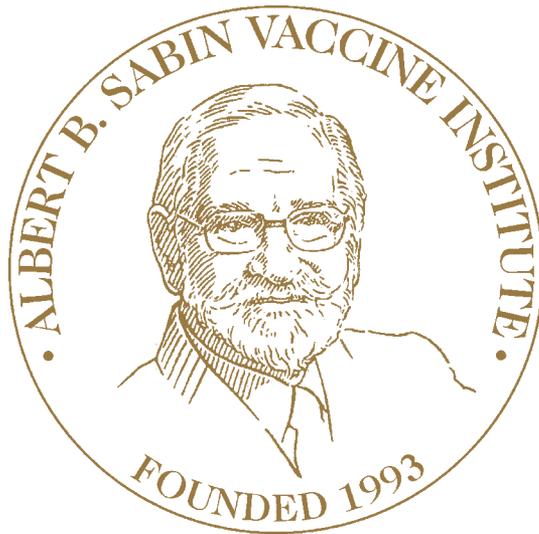


The Albert B. Sabin Gold Medal Address



Delivered by Award Recipient

Stanley A. Plotkin, M.D.

With a Tribute by

Michael Katz, M.D.

On the Occasion of the Presentation of
the 2002 Albert B. Sabin Gold Medal

Tuesday, May 7, 2002

Baltimore, Maryland

INTRODUCTION

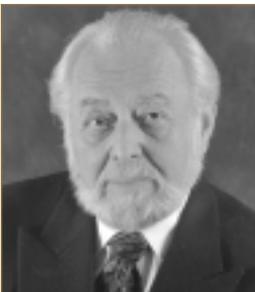
by *H.R. Shepherd*
Chairman, The Albert B. Sabin Vaccine Institute

The Sabin Gold Medal is awarded annually and recognizes exemplary leadership in the field of vaccinology and disease prevention. The 2002 award was presented to Stanley A. Plotkin, M.D. at a ceremony in Baltimore, Maryland, during the 5th Annual Conference on Vaccine Research, co-organized by the Sabin Vaccine Institute.

Stanley Plotkin is an extraordinary figure in the field of vaccinology and truly epitomizes dedication to conquering disease with vaccines and immunization, the same passion by which Albert Sabin lived. I first had the privilege of meeting Dr. Plotkin in Paris in December 1995 at Pasteur Mérieux's international meeting on the history of vaccinology. That occasion brought together the giants of the polio vaccine field: Hilary Koprowski, Charles Mérieux, Darrel Salk representing his father Jonas Salk, and Heloisa Sabin representing her husband Albert Sabin. The results of the meeting were edited by Stanley Plotkin into a remarkable compilation under the title *Vaccinia, Vaccination, Vaccinology: Jenner, Pasteur and Their Successors*. Now, in 2002, we recognize Stanley Plotkin as a scientist who has made history as one of the successors to Jenner and Pasteur.

The Sabin Vaccine Institute has continually addressed the need for vaccine development to counter the effects of existing diseases. As we enter the 21st century, tempered by the events of the past nine months, we look with greater urgency to vaccine developers, like Stanley Plotkin, whose dedication and leadership have provided us a measure of security while facing the global health challenges of this new century. His achievements in vaccinology are on a scale that truly can be measured in lives saved and lives restored.

The Institute was pleased to welcome many of Dr. Plotkin's friends and admirers to the award presentation. We also are gratified to have captured the following addresses to share with those who were unable to join us or who want to reflect more fully on the remarks of the honoree and of his esteemed colleague, Michael Katz, M.D.



The Sabin Gold Medal Advisory Committee, which canvasses 300 members of the scientific community in making its selection, is chaired by Maj. Gen. Philip K. Russell, M.D., (USA Ret.), who is the seventh recipient of the honor. The Institute is grateful for the committee's commendable selection of a worthy 2002 candidate.

H.R. Shepherd

STANLEY A. PLOTKIN, M.D.
2002 ALBERT B. SABIN GOLD MEDAL RECIPIENT

Stanley A. Plotkin, M.D., is medical and scientific advisor to Aventis Pasteur, one of the world's largest vaccine companies and one that is dedicated to preventive and therapeutic vaccines in the areas of infectious diseases and cancers. His tenure with the company complements an impressive and productive medical, academic, and public health career. He is perhaps best known as the developer of the rubella vaccine that is the only one in use in the U.S. and throughout most of the world.



Dr. Plotkin joined Aventis Pasteur in 1990, when the company was known as Pasteur Mérieux Connaught. He retains the title of emeritus professor from his prior faculty membership at the University of Pennsylvania. There, he was professor of pediatrics and microbiology and professor at the Wistar Institute, a medical research institute honored for the discovery of vaccines and genetic and molecular therapies. He served concurrently as director of infectious disease and senior physician at the Children's Hospital of Philadelphia. For two years, he was associate chairman of the Department of Pediatrics at the University of Pennsylvania.

Dr. Plotkin earned his medical degree from the State University of New York in 1956. He spent three years in the Epidemic Intelligence Service of the Centers for Disease Control and Prevention of the U.S. Public Health Service. In 1957, he investigated the last known outbreak of inhalation anthrax in the United States prior to the events of 2001, and helped demonstrate the efficacy of the current anthrax vaccine.

The scientific and academic committees on which Dr. Plotkin has served are numerous. He chaired the Infectious Diseases Committee and the AIDS Task Force of the American Academy of Pediatrics, was liaison member of the Advisory Committee on Immunization Practices (ACIP), and chaired the Microbiology and Infectious Diseases Research Committee of the National Institutes of Health. This Sabin Gold Medal honoree is also known as the "Founding Father" of the Pediatric Infectious Diseases Society.

Dr. Plotkin's contribution to scientific literature includes over 500 articles. He has edited several books, including *Vaccines*, now the standard textbook in the field. His invention of the rubella vaccine is responsible for almost completely eliminating congenital rubella syndrome in countries where it is used. Dr. Plotkin has also worked extensively on the development of other vaccines including polio, rabies, varicella, AIDS and cytomegalovirus.

TRIBUTE TO
STANLEY A. PLOTKIN, M.D.

*by Michael Katz, M.D.
Senior Vice President for Research
March of Dimes Birth Defects Foundation*

It is truly a pleasure for me to address you today as we gather here to witness your awarding of the Albert B. Sabin Gold Medal to Stanley Plotkin. As I view the list of the previous recipients, I note that Plotkin joins a highly distinguished group who would in any endeavor be considered peers, but in the field of vaccine development and application must also be described as mavericks. Every one of them a fighter, each an iconoclast. I bow to all of them, for they have made our life easier.

On a personal note, the pleasure of acknowledging Dr. Plotkin's contribution comes just seven months short of the 50th anniversary of our friendship—which I would prefer to be able to date to kindergarten, but in truth must date to medical school. Our friendship has lasted this long because we truly understand each other and our respective behavior patterns. Through this understanding, we have protected each other in many ways. One such is that neither of us will send a vituperative letter to the editor without the other one's reading and approving it first.

Friendship, of course, is not license, and so this will not be a warts-and-all picture, but—on the other hand—it will not be a retouched photo either.

Stanley is a very precise man. In his efforts to leave no doubt about what he wishes to express, he approaches comments or answers to questions in a centripetal direction, that is, he makes all the necessary qualifications and exclusions first, before moving to the core. In that he is somewhat like a matador, who exhausts the bull first, before administering the final definitive gesture. It is this characteristic that has stood him in good stead in science, because it really is a reflection of a precise mind. He is one of the clearest thinkers I know. Stanley can be described as a "scientist by birth," but science is not his sole occupation. A man of exceptionally broad intellectual interests,

he reads voraciously, follows all aspects of visual and aural art and is a poet. Once, reflecting on his visit to Point Reyes in California he wrote:

*The sharp wind blew in from the western sea
As we walked to the promontory's edge
We shivered, leaning forward to the blast
Until we came upon the utmost edge.*

*Before our eyes the sea came roiling in
On rocks so far below we heard no noise
Save the foghorn's distant echoing bass,
Counterpoint to the cymbals of the buoys.
And farther still we saw the milk-white fog
Rise from water like Venus wrapped in shrouds*

*Covering, erasing all distinctions
Of silver rock, green ocean, and grey clouds.
In this etiolate world gone is the sun
And the earth, the sea and the sky are one.*

But I seem to have advanced too far, so let me start at the beginning, or nearly so.

A graduate of Bronx High School of Science, that breeding ground for academicians of quality, in the Borough of New York City in which he was born, he continued his studies at what was then the uptown campus of NYU and finally in medical school at the State University of New York in Brooklyn.

It was in medical school that he carried out his first scientific clinical study under the mentorship of Bob Austrian and it did not concern any vaccines.

During his internship, he made the observation that that there was a predominance of blood type B among premature infants and those stillborn. To my knowledge this has not been followed up. A much later publication of note was the paper that described his rubella vaccine, the RA/27-3. Let me now tell you what happened in between.

After a rotating internship in Cleveland Metropolitan Hospital, where he profited from contacts with Fred Robbins, he was subject to the doctors' draft, but managed to be inducted into the US Public Health Service as Senior Assistant Surgeon with orders assigning him to the Epidemic Intelligence Service at the CDC, then still under the direction of its creator Alex Langmuir.

In this capacity, he became the anthrax control officer for the northeastern United States, based at the Wistar Institute in Philadelphia. There he fell under the wing of Hilary Koprowski and—human anthrax not being very prevalent in those days—soon became immersed in the program of the development of polio vaccine. His anthrax control duties, however, involved him in the study of inhalation anthrax, the report of which was recently reprinted in *Clinical Infectious Diseases*.

As part of the polio work, he was dispatched to the Congo to conduct a trial of the vaccine that was then under development. (A recent consequence of that trip was the infamous book, *The River* by Edward Hooper, in which he, along with Hilary Koprowski, was accused of starting the epidemic of AIDS in the world. The problem with Hooper's book was that it was not even good science fiction. Nevertheless, the Royal Society took it seriously enough to call for a large international meeting, which was held in London. In that assembly Hooper persisted with his accusations and Stanley and Hilary provided a solid rebuttal by offering facts that contradicted Hooper's inventions. Stanley finally delivered what in my view was an elegant *coup de grace*, when he said about the search for a "smoking gun": "There is no gun (the chimpanzee cell), no bullet (the virus), no shooter (a guilty scientist), no motive, and the only smoke is that created by Mr. Hooper."

The polio work at the Wistar Institute was so exciting to him—even if anthrax was not—that he extended his service in the Public Health Corps for an extra year. When that was over, Stanley was accepted for a residency training in pediatrics at the Children's Hospital of Philadelphia. Koprowski considered his work at the Wistar of such high quality that he tried to keep him from leaving, but to his disappointment he failed. Indeed, at a farewell dinner for Stanley, Hilary emoted in this slightly censored version: "Once in a rare while comes a real scientist and what does he want to do, but go and cut a boil on somebody's rear end."

And so Stanley moved to CHOP, and then for a year to the Hospital for Sick Children—that British term that always makes me wonder whether they have hospitals for healthy children—in London. It was there that he collaborated with a number of infectious disease experts and established lifelong friendships with them; among them was the late Alister Dudgeon.

When his training in pediatrics was completed—and I have no knowledge whether he actually did drain any boils—he returned to Philadelphia in 1959, was welcomed back to the Wistar Institute and was also appointed to the staff at the Children's. He resumed his studies on polio, but the 1964 epidemic of rubella presented a new opportunity, which became his predominant, but by no means his sole scientific interest.

Stanley approached his rubella studies with the aim of creating a vaccine against this infection. He was not alone in this effort and several other laboratories were hard at work on this. By 1968 there were four candidate vaccines, two variants of HPV-77—one propagated in duck embryo tissue culture and the other in dog kidney tissue culture—the Cendehill strain propagated in rabbit kidney tissue culture, and Stanley’s RA 27/3 developed and propagated in the human diploid fibroblast tissue culture, the WI-38 strain. After the usual questions of detectable side effects, with the most prominent one of arthralgia and arthritis, were assessed, the remaining argument presented was that human tissue culture could contain as yet undefined and therefore undetectable human cancer viruses. It was this argument on which a conference held at the NIH in 1968 pivoted and it was there that Albert Sabin and Stanley crossed swords.

Sabin expressed and defended his view that the human diploid cells in culture could be propagating human cancer viruses and that the current means of detection were insufficient to assure us of their absence. He objected to the arguments about safety of WI-38 and I quote: “There is no question that a diploid cell that has been carefully tested offers many advantages over primary cell.” However, Sabin argued that—and I quote again— “...the WI-38 cells are no more fully characterized in the light of intangibles for which there is no technology, than other cell lines.” He also took exception to the accusation that this was not a rational argument but an emotional one. It was Stanley’s turn to respond and this is how he began: “I shall start by saying that at last diploid cells have an opponent worthy of the concept. As I recall from the polio days, debating with Dr. Sabin is very much like getting into a bear pit. One does not come out in exactly the same shape as one went in. But I must say that despite my great and sincere respect for Dr. Sabin, I think the statements that he made are strictly *ex cathedra* and without factual basis.” After reviewing what was then known about the WI-38 cells and the argument that they could contain human leukemia virus and other oncogenic viruses, he cited the many studies that failed to identify any oncogenic agents in the WI-38 cells. Finally, he concluded: “...what we are dealing with here is theology, and you see, in theology it is very difficult to disprove the existence of things. One cannot disprove the existence of ghosts. But this is not to my mind, a basis for making intellectual decisions.”

When the meeting broke for lunch and we repaired to the cafeteria, Dr. Sabin spotted Stanley, put his arm around him, smiled, and asked, “Are you bleeding?” No doubt, this was Sabin’s form of extending an olive branch. In my opinion, bloodied or not, Stanley won the argument.

This was not the conclusion of the rubella vaccine story. Much happened between then and its final approval and licensing in 1979. But in the end the

RA 27/3 became virtually the sole rubella vaccine used throughout the world and it is this that we celebrate tonight.

Stanley, of course, did not stop working. He continues to devote his efforts to the development of a cytomegalovirus vaccine; he was a collaborator of Koprowski and the late Tad Wiktor in the development of diploid cell-based rabies vaccine, and with Fred Clark developed two strains of rotavirus vaccine. These and other studies are documented in nearly 600 original publications and his continued commitment to vaccines has spawned now three editions of the book *Vaccines* which he has co-edited, first with Ted Mortimer and now with Walt Orenstein. The fourth edition is now in gestation.

Stanley's academic career developed in parallel with his scientific path. Starting as an instructor in pediatrics in 1959, by 1974 he was Member of the Wistar Institute and professor of pediatrics at the University of Pennsylvania. In 1974 he was named Wistar Professor of Pediatrics and in 1981 also Professor of Microbiology. In 1991 he became an Emeritus Professor and

Michael Katz, M.D. is vice president for research, March of Dimes Birth Defects Foundation. He is also Carpentier Professor Emeritus of Pediatrics, Professor of Public Health, Emeritus at Columbia University and a consultant to the Presbyterian Hospital. He was the Reuben S. Carpentier Professor and Chairman of the Department of Pediatrics at Columbia University's College of Physicians and Surgeons, professor of public health in the faculty of medicine and director of the Pediatric Service at Babies Hospital, a Division of Presbyterian Hospital in New York City until 1992.

Dr. Katz's experience spans numerous academic and clinical appointments in this country, as well as abroad. These include Harlem Hospital and Children's Hospital of Philadelphia. Before joining Columbia University, he was on the faculty of Makerere University College in Kampala, Uganda, was an associate member of the Wistar Institute in Philadelphia, and was an assistant professor of pediatrics at the University of Pennsylvania. His research interests have involved studies of slow virus infections, rubella, measles, parasitic infections, and the relationship of malnutrition to host response.

In addition to these activities, Dr. Katz has made significant contributions to maternal and infant health internationally through his involvement with such bodies as the World Health Organization, the Pan American Health Organization, UNICEF, and the U.S. Agency for

he joined what was then known as Pasteur Mérieux Connaught Vaccines as its Medical and Scientific Director in Paris. In 1997 he returned to the United States as Medical and Scientific Consultant to what is now known as Aventis Pasteur.

Stanley has been a recipient of several honors: James D. Bruce Award for Preventive Medicine from the American College of Physicians in 1987; Distinguished Physicians Award from the Pediatric Infectious Diseases Society in 1993; Clinical Virology Award from Pan-American Group for Rapid Viral Diagnosis, in 1995. In 1998 he was made Chevalier of the French Legion of Honor.

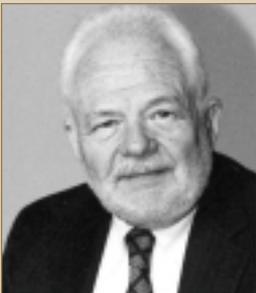
Finally, there has been a recent recognition in the *Philadelphia Inquirer* of the success of his rubella vaccine.

The Sabin Institute Gold Medal is an acknowledgement of Stanley's contributions to medicine and science. It comes, by a pleasant coincidence, on the verge of an anniversary of his birth and I cannot think of a better way of wishing him a Happy Birthday! Thank you.



International Development. He has served as a consultant and in other advisory capacities to a number of organizations, including the National Institutes of Health, National Science Foundation and several private foundations.

Dr. Katz is a native of Poland and earned his A.B. degree from the University of Pennsylvania and his M.D. from the State University of New York, Downstate Medical Center. He completed his internship at the University of California Medical Center in Los Angeles and his residency in pediatrics at Presbyterian Hospital in New York City. He continued his education earning a M.S. degree in tropical medicine-parasitology at Columbia University School of Public Health. He is a member of a number of societies, including the Society for Pediatric Research, the American Pediatric Society and the Institute of Medicine, and is a fellow of the Infectious Diseases Society of America. He is also a recipient of a number of awards and honors, including a Fellowship in the American Association for the Advancement of Science and the Alexander von Humboldt Senior U.S. Scientist Award from the German government.



Michael Katz, M.D.

REMARKS UPON ACCEPTANCE OF THE 2002 ALBERT B. SABIN GOLD MEDAL

*by Stanley A. Plotkin, M.D.
Medical and Scientific Advisor
Aventis Pasteur*

“Young people, young people, entrust yourselves to those sure and powerful methods of which we only know the first secrets. And whatever your career, don’t let yourself fall into sterile skepticism, don’t let yourself be discouraged. Live in the serene peace of laboratories and libraries...until the moment when you will have perhaps the immense happiness of thinking that you have contributed something to the progress and well-being of humanity. But whether or not your efforts are favored by life, when you approach the end, you must be able to say to yourself: ‘I did what I could.’”

*—Louis Pasteur, on the occasion of the
dedication of the Pasteur Institute in 1888.*

Mme. Sabin, General Russell, Mr. Miller, Friends and Colleagues:

To receive a medal bearing the name of Albert Sabin is without doubt a great honor, as Sabin was a giant among vaccinologists. My pleasure is doubled by receiving the award at the hands of Michael Katz. We have known each other since medical school, where by chance we became roommates. I will remember our late night conversations and debates about medicine and many other subjects. Michael has been my friend and wise counsellor throughout the vicissitudes of life, and I am enormously indebted to him.

During my career I have worked on many vaccines, including rubella, varicella, rotavirus, rabies and cytomegalovirus, but the most interesting colleagues were those working on polio vaccines, like Albert Sabin. I first met Sabin through Hilary Koprowski, and was much impressed by his scientific rigor and his organizational abilities. Albert was an intimidating person who,

had he been a clergyman, would have been a Savonarola, bringing down wrath on his adversaries. However, he was also scrupulously honest, and as critical of himself as he was of others. The fact that he held no grudges says much about the man and his qualities. After the rubella debate, Albert remained a friend, and eventually when he changed his mind about human diploid cells he said so publicly.

The award of a prize to someone late in life must cause him to reflect on how he came to do what the prize rewards. My interest in science started at an early age, certainly before 13 years, because it was then that I was admitted to the Bronx High School of Science, then as now a highly competitive institution. In my 15th year, I read a novel that would change my life: *Arrowsmith*, by Sinclair Lewis. This novel, hardly read today, is the story of a young American who goes to medical school, where he meets a teacher of immunology called Max Gottlieb, a German émigré. Gottlieb becomes Arrowsmith's mentor. Although Arrowsmith has a long peripatetic life during which he tries family medicine and other pursuits, he eventually returns to work with Gottlieb at a research institute. There he becomes involved both in fundamental immunology and in vaccine development.

With the help of Paul De Kruif, author of *Microbe Hunters*, as a consultant, Lewis described the life of science—the long days and nights in the laboratory, the frustration of failed experiments, the Euclidean beauty of an experiment well done, the excitement of accidental discovery, the pleasure of collaboration with other scientists but the pain of being second to a competitor. Among the memorable passages in *Arrowsmith* is the following:

To be a scientist—it is not just a different job, so that a man should choose between being an explorer or a bond salesman or a king or a farmer. It is a tangle of very obscure emotions, like mysticism, or wanting to write poetry; it makes its victim all different from the good normal man. The normal man, he does not care much what he does except that he should eat and sleep and make love. But the scientist is intensely religious—he is so religious that he will not accept quarter-truths, because they are an insult to his faith.

You can imagine what an elixir that paragraph was for a 15-year-old boy. It impelled me through college and medical school, with the help of scholarships from the State of New York, to which I am much indebted.

Once in medical school, I wormed my way into the laboratory of Dr. Robert Austrian, where needless to say, I learned a lot about pneumococci. In addition, Bob taught me his rigorous approach to experiments. Later, Bob and I ended up at the same university and he became my friend as well as teacher.

I joined the Epidemic Intelligence Service at CDC to fulfill my military obligation. At the end of the EIS training course, I asked for the assignment to the Anthrax Investigations Unit at the Wistar Institute in Philadelphia, much to the disbelief of Alex Langmuir. In those days, Philadelphia was still the butt of jokes such as WC Fields' alleged tombstone inscription: "better here than in Philadelphia." But I had begun to read widely in virology, and was very impressed by the work of Hilary Koprowski, then at Lederle Labs. He was moving to become director of the Wistar Institute, and I reasoned that if I went to Wistar to join the anthrax laboratory, I might be able to insinuate myself into his lab. And so it proved.

It was thus that Hilary became my Max Gottlieb.

I learned a lot from Hilary, perhaps as much in the way of music, art and life in general as about science. He taught me to find the heart of a problem, and not to get lost in peripheral matters.

The work in the polio laboratory consumed most of my interest and led me into the field to test new attenuated strains, including trials in what was then called the Belgian Congo. The cultural shock engendered by that visit to an undeveloped country was unforgettable. More important, it taught me that vaccine development did not end in the laboratory, and that field studies were not only essential, but also difficult and even dangerous. And the contact with epidemic infectious diseases was educational, to say the least.

After a detour to obtain credentials as a pediatrician, I returned to Wistar to work on rubella. Those years were fraught with advances and reverses, controversy and eventually vindication. The pandemic of CRS babies in 1964-65 was an important stimulus to research on the vaccine. It illustrates why it will be a pity if the current trend separating clinical work from research is allowed to continue, thus preventing laboratory researchers from having clinical experience.

Moreover, it should be said that nothing could have been done on vaccines without the preceding isolation of the rubella virus by Weller and Neva and by Paul Parkman and associates.

The controversy over diploid cells was also interesting from the philosophical point of view. It started with the dogma that no normal human cell could be passaged a significant number of times without becoming cancerous, and it ended with human diploid cells becoming a gold standard for vaccine production. Thus, we see the correctness of the view that new ideas start as heresy and end as orthodoxy.

It was great fun to build a division of infectious diseases at the Children's Hospital of Philadelphia (CHOP) and to enjoy the development of my younger associates. When I started at CHOP, the field of pediatric infectious diseases

was not yet a specialty, but it became one. The title of “Founding Father” of the Pediatric Infectious Diseases Society is something I am very proud of.

Nevertheless in 1990, after more than 35 years in Philadelphia, I realized that a career change was in order. At that point an unforeseen opportunity arose when I was offered the post of Medical and Scientific Director of the trinational vaccine company that had just come into being with the fusion of the Institut Mérieux and Connaught Laboratories. I had long known and respected the founder of the company, the great vaccine industrialist, Charles Mérieux.

The prospect of leaving academia was not one I had previously considered, and I dithered about it for several months, until one day, during a visit to Paris, I stood on the Pont des Arts, with the river Seine flowing beneath my feet, looking out at Notre Dame and the Ile de la Cité, and like Henry IVth decided that Paris was worth the risk.

Many have said that I went to France for the food and the wine, and that is true! But that is not the only truth. I had long been an admirer of French civilization and intellect, and of the Gallic sense of fun, as cynical as it sometimes is. Moreover, Voltaire, with his lucid prose and acerbic wit, had become one of my favorite writers. It is not generally known that Voltaire, like his friend Benjamin Franklin, was an ardent vaccinationist, as can be judged from one of his Persian Letters, in which he amusingly and ribaldly explains why the beautiful women of the Caucasus were scrupulously protected against disfigurement by smallpox through variolation.

In France I entered the world of industry. It was a shock to realize that for the first time in my life, my decisions about research projects were truly important. Now, when I made a decision, people moved, a lot of money got spent, and there were consequences. The second shock was to realize how difficult and complex the whole operation is. This gave me a new respect for people in industry, whom I found to be just as dedicated as those outside, but with plates that were very full and perhaps more difficult to empty.

Vaccinology is a continuum that cannot succeed unless all parts function, and despite its successes, vaccinology is being challenged as never before. The problems of immunizing against chronic intracellular infections and infections where immune responses create pathology are considerable. Although the techniques now exist to produce almost any antigen needed, that ability is not sufficient in itself for vaccine development. Understanding the pathogenesis of infectious diseases is critical to the application of these antigens, and currently the study of pathogenesis is a relatively neglected area. Once an antigen is demonstrated to be protective in animal models, a manufacturer may take over further development, but licensure and widespread use cannot be accomplished without the collaboration of

epidemiologists and public health people at all levels. Once developed, if a vaccine is not recommended by public health authorities, it will fail even if effective, as recently demonstrated by the withdrawal of Lyme disease vaccine. Industry must know what public health officials want. Indeed, the relationship between government and the vaccine industry is similar to that between government and the defense industry: interdependent and essential to the public good.

The vaccine endeavor has been called “a delicate fabric” whose integrity we must seek to preserve. The threats to this fabric are many, but three are most important: cost, supply, and safety. Roughly three quarters of the world’s peoples are desperately in need of vaccines and desperate to obtain them. Yet the cost of developing a single vaccine is counted in hundreds of millions of dollars, and therefore will be reflected in the cost of the final product. Vaccination is not the only area in which the disparity between rich and poor is stark, but it is more poignant because the result of the disparity is so easily predictable and because the money required to close the gap is small relative to other parts of the economy. No easy solution to this dilemma is in sight. Less stringent regulatory standards for poor countries would be logical, but ethically this appears to be unacceptable. The way forward seems to be the creation of markets that are attractive because of their size, even if prices are low, and the willingness of both governments and philanthropy to consider prevention of communicable diseases a priority.

But if by some magic wand there were money enough to develop and purchase vaccines for all the world’s peoples, including 137 million newborns each year, industrial capacity would be grossly insufficient. It also is obvious that bioterrorism has greatly expanded the need for vaccine manufacture and made it dangerous to cease production of vaccines that we naively thought might no longer be needed. The world depends on a handful of major vaccine companies, all subsidiaries of drug manufacturers. This industry is undercapitalized. To face the tide of rising expectations throughout the world, more investment must be made in building and maintaining vaccine manufacturing facilities, especially those located in developing countries. Those facilities are national and international resources and specific investment, public or private, must flow to them.

Finally, while safety has always been important, the rise of anti-vaccinationists in the one quarter of the world that has access to vaccines, and therefore no longer sees the diseases for which the vaccines were developed, has led to a new emphasis on vaccine safety, even for theoretical risks. For example, extraordinary amounts of resources are being consumed with regard to seed material to eliminate any possibility that prions may have been present in serum used many years ago that may have come from cows

that may have been incubating BSE. Interestingly, both of the activities I was engaged in during the late 1950s, polio and anthrax, became matters of retrospective accusations with regard to safety.

The most important lesson from those recent controversies is the need to be passionate about truth. Vaccines, like science in general, are under attack as never before. Yet every accusation must be evaluated, and if correct, as in the case of rotavirus, responded to with a better vaccine; and if incorrect, such as measles vaccine and autism, vigorously fought, or we will sink into another Dark Ages of mysticism and pseudoscience.

We should not expect these efforts to be easy. Each issue will have to be dealt with fairly, even if the current zeitgeist is not conducive to objectivity. Nevertheless, that is our responsibility, and we should gladly accept it, for vaccines have been incredibly successful and there is reason for pride in that accomplishment.

Before I close, permit me to give heartfelt thanks to my wife, Susan. Francis Bacon wrote, “wives are young men’s mistresses, companions for middle age, and old men’s nurses.” Susan has been all three, both serially and simultaneously.

I accept this award with pleasure, but also with the recognition that success and failure are but the Janus faces of fortune—and that humility and stoicism are the only appropriate emotions when either face shines upon you. In the last analysis this medal goes to a 15-year-old boy from the Bronx, full of ambition and magnificent dreams. On the whole, I think it is right that this should be so, for the future of vaccines and indeed of our entire world depends on the dreams of those who are now 15-year-old boys and girls.

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The Albert B. Sabin Gold Medal

The Albert B. Sabin Vaccine Institute awards the Albert B. Sabin Gold Medal to recognize and honor those who have made extraordinary contributions to the field of vaccinology.

Past Honorees



Donald A. Henderson, M.D., M.P.H., 1994
Robert M. Chanock, M.D., 1995
Joseph L. Melnick, Ph.D., 1996 (*d. 2001*)



Maurice R. Hilleman, Ph.D., D.Sc., 1997
Myron M. Levine, M.D., D.T.P.H., 1998
Allen C. Steere, M.D., 1998



Philip K. Russell, M.D., 1999
Ciro A. de Quadros, M.D., M.P.H., 2000
John B. Robbins, M.D., 2001

The Albert B. Sabin Vaccine Institute

The mission of the Sabin Vaccine Institute is to save lives by stimulating development of new vaccines and increasing immunization rates globally. The Institute sponsors cutting-edge vaccine research and innovations, identifies new vaccine research opportunities, advocates sound public policy toward vaccine research and immunization, and educates the public and media about the benefits of vaccines. Founded in 1993, our independent, nonprofit educational and research institute builds bridges between leaders in science, academia, industry, and government to create solutions to worldwide health threats. In pursuing the legacy of renowned vaccinologist and statesman Dr. Albert B. Sabin, the Institute is a catalyst for research on vaccines for emerging and ancient diseases, from hookworm to cancer to AIDS. By helping to unlock the vast potential of vaccines, we are working to ensure that the diseases that threaten us today will be only history lessons for future generations.

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