INTERNATIONAL HEALTH—2000 A.D.[1]

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Coordination of national programmes, with pooling of technical, administrative, and financial resources which only the Pan American and World Health Organizations can effect, is essential to the success of eradication efforts. In the absence of unexpected political complications, the next few years should see the end of endemic areas capable of maintaining smallpox infection. Always on the ultra-conservative side, let us predict smallpox as but a memory before 2000 A.D.

There is ample justification for a special number of the *Boletín de la Oficina Sanitaria Panamericana* to mark its Golden Anniversary. In 1922 the *Boletín* became the faithful witness to the continuing threat of the communicable diseases and, equally important, to the specific points from which the threat came. It has also been a reminder of the existence of the Pan American Sanitary Bureau (PASB) to health authorities throughout the Americas, even when field programs were scarce and meetings delayed. Since 1949 the *Boletín* has served to maintain the double image of the Pan American Health Organization (PAHO) as a Specialized Agency of the Organization of American States and as the Regional Organization for the Americas of the World Health Organization (WHO). It is a continuing reminder that the countries of the Americas contribute annual quotas to two international health budgets.

The invitation to contribute an article on "International Health—2000 A.D." for the anniversary number of the *Boletín* caused me to review the initial issue (May 1922). In the Introduction, I found the following:

". . . y de dicha Oficina surgirá un constante estímulo para las autoridades sanitarias locales, para tomar las medidas necesarias con el fin de eliminar por completo las enfermedades contagiosas. . . . Ha llegado el momento en que debe establecerse una inteligencia y cooperación más íntimas entre las autoridades sanitarias de las Américas, en su incesante lucha contra la propagación de las enfermedades transmisibles con el fin de obtener la completa eliminación de las mismas" (*1*). In the same number there appeared an article by B. J. Lloyd on "Diagnóstico diferencial y extirpación de la viruela" (*2*).

I also reread the Pan American Sanitary Code of 1924. Among the objects of the Code is "Art. 1, (b) The promotion of cooperative measures for the prevention of the introduction and spread of disease *into* and *from* the territories of the Signatory Governments" (*3*) (italics added).

Today these documents of fifty years ago seem almost prophetic; since 1947 the Bureau has been a constant stimulus to national authorities to prevent the spread of smallpox into and from Member States; its extirpation is on the verge of becoming a fact, not only in the Americas but in the rest of the world as well.

Looking back on the past half century, I find little to tempt me to accept the role of prophet even for the much shorter period of the next three decades. Who could have foreseen the impact of DDT on vector control and the recent interdictions on its manufacture, sale, and use? Or the development of poliomyelitis vaccine? Or the unwonted spread of cholera in the last decade? Or the

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discovery of the so-called hemorrhagic dengue? Or, on the international scene, the creation of the World Health Organization through which coordination of health programs around the world could be effected? And the regional expansion of the Pan American Health Organization and its effective relationship with WHO?

But I am already on record with regard to the trend of future activities. In 1966 I said:

"Our generation has no excuse to offer future generations if we continue to permit half of the human race to suffer from smallpox while we attempt to defend ourselves with costly and inefficient quarantine and vaccination certificates. The selling has been done; the tools are available; support has been assured; the program is already well advanced. The only question is whether our national and the international administrative agencies can measure up to the challenge" (*4*).

In 1967, after referring to regional and world programs for the eradication of *Aedes aegypti,* malaria, smallpox, and yaws, and pointing out that techniques were available for the eradication of other communicable diseases, I continued:

"In the future, the official international health organizations are certain to become more and more involved in eradication programmes. Coordination of national programmes, with the pooling of technical, administrative and financial resources which only the Pan American and World Health Organizations can effect, is essential to the success of eradication efforts. I would enter a special plea for eradication. It is by its very nature democratic. It cannot be limited to the well-developed countries, nor to the more densely populated and accessible areas of any country. Its inexorable zero objective forces an excellence of administrative techniques seldom achieved in other health programs" (*5*).

This statement was made just as the WHO accelerated campaign for the eradication of smallpox was beginning; today this global effort is approaching success. Those interested in communicable disease prevention on continental and global scales have learned by experience that although the specific problem in a given country may be resolved in a few years, regional and global eradication programs may require decades. One cannot but ask why, in the specific case of smallpox eradication, did it take so long for the effective "coordination of national programmes, with the pooling of technical, administrative and financial resources," to occur? Considering that each of the countries of the world is a potential residual focus of infection, one might ask with equal reason, what are the forces which have made it at all possible?

A study of the action of the governing bodies of PAHO and WHO may give a partial answer to these questions and a basis for projecting future international health activities.

The official international health organizations, PAHO and WHO, have been the coordinating agencies for smallpox eradication, operating under what may be described as limited mandates. These agencies operate under the control of governing bodies, whose legislation has authority over them but not over the Member States where all effective action must occur. Only in the matter of budget assessments has the authority of the governing bodies been recognized as binding on Member States. In other matters, by iteration and reiteration—line upon line, precept upon precept, year after year—the resolutions of these bodies eventually become recognized as mandates for Member States. Such recognition depends on effective compliance by an increasing number of States which exert pressure on the remainder.

The move to involve the international health agencies in smallpox eradication goes back a quarter of a century. Let us look at the early development of the smallpox eradication program by PAHO before taking up the WHO campaign.

PAHO and Smallpox Eradication, 1947-1958

A small outbreak of smallpox in New York City in March and April 1947 roused

several million persons to seek vaccination. It also moved the Director of PASB to include in September of the same year, in the PAHO expanded program, "h) The development of an active administrative collaboration for certain regional campaigns . . . [including] the eradication of smallpox . . ." (*6*).

The importance of smallpox eradication was emphasized by 17,679 reported cases in the Americas in 1947 and 26,761 in 1948.

In May 1949, the very month WHO and PAHO joined hands, the Executive Committee of PAHO approved a proposal of the Director to promote the cooperation of the American countries in national programs designed to eradicate smallpox. Before becoming involved in the eradication effort, the PASB turned to the U.S. Public Health Service for help in developing a method to produce a thermostable vaccine. The freeze-dried technique was worked out by the Michigan State Department of Health Laboratories in 1950.

The 1950 PASB plan of eradication (*12*) called for the development of national vaccination programs based on the use of freeze-dried vaccine in those areas where adequate refrigeration was not available. The Bureau would promote the production of freeze-dried vaccine by furnishing technical advice, laboratory equipment, and the training of technical staff. The Bureau did not anticipate participation in emergency short-term vaccination campaigns. The Bureau considered a ready local supply of adequate quantities of freeze-dried vaccine as the key to eradication.

Early in 1950, Dr. A. Horwitz, later to become the Director of PASB, became the Bureau's representative promoting smallpox eradication. One of the results of his activity was the proposal of the delegate of Costa Rica to the XIII Pan American Sanitary Conference (1950) for a resolution on smallpox eradication. The Conference, noting a budget item for smallpox and the recommendation of the Third World Health Assembly (1950) for intensification of smallpox programs, urged Member States to develop "systematic smallpox vaccination and revaccination programs with a view to eradicating this disease" (CSP13.19) (*7*). These programs were to be coordinated by the PASB, which was charged to help solve the technical, economic, and legal obstacles which might be encountered.

In a separate resolution (CSP13.6), the XIII Conference, recognizing the necessity of concerted action for regional programs, urged individual Member States to give full support to international, regional, and continental programs, *even when these were apparently not of immediate or primary importance to them.* This resolution emphasized the obligation of each infected or infested country to participate in officially adopted international eradication efforts.

In 1952 the Directing Council (CD6.23) (*7*) assigned excess working capital funds to the supplementary program against smallpox and specifically authorized the Executive Committee to include the supplementary program against smallpox in the Bureau's budget for 1954 in an amount sufficient to assure its continuity.

In 1953 the Directing Council (CD7.27) (*7*) reported to the Director-General of WHO that, since 1950, PAHO had as one of its basic programs the eradication of smallpox throughout the Americas, that intergovernmental agreements had given good results in preventing border epidemics, and that the quality of vaccine was of fundamental importance. It recommended that WHO provide equipment and technical advice on the production of glycerinated and dried vaccine, that WHO make available the administrative experience of experts in smallpox campaigns, and that "anti-smallpox campaigns be an *integral part of permanent, over-all public health programs,* or the *starting point for such programs*" (italics added).

In 1954 the XIV Conference (CSP14.13) (*7*) made surplus funds of 1953 available

for the intensification of the campaign against smallpox.

Smallpox eradication was not the subject of Directing Council resolutions in 1955, 1956, and 1957.

In 1958 the XV Conference (CSP15.6) (7), referring especially to the smallpox eradication resolution of the Eleventh World Health Assembly of the same year, declared smallpox eradication to be a public health necessity and urged all countries with smallpox to execute nationwide plans for eradication. Member Governments were requested to supply vaccine and technical advice to other countries to achieve continental eradication. The PASB was to take all necessary measures, including collaboration in the production of vaccine, advice on the organization of eradication campaigns, and the convocation of intercountry meetings to promote coordination of smallpox activities.

WHO and Smallpox, 1948-1971

On the world scene, the Joint Smallpox Committee of the Office International d'Hygiène Publique and the Interim Commission of the World Health Organization noted in 1948: "Dry vaccine, such as prepared at the Paris Animal Vaccine Institute, has for a number of years proved highly effective in the French colonies, even after very prolonged exposure to heat" (8).

The Third World Health Assembly (1950, WHA3.18) (9) requested the Expert Committee on Biological Standardization to report on testing and standardizing smallpox vaccine, especially the freeze-dried variety. It also recommended greater emphasis on smallpox in the regular WHO program for 1952. During the discussion it was argued that the persistence of the smallpox problem 150 years after the introduction of vaccination was reason for greater support to general health services. "Diseases should be fought collectively rather than singly."

Three years later the 11th meeting of the Executive Board of WHO (1953, EB11.R58) (9), noting that two regional committees had expressed interest in campaigns against smallpox, recommended that the Sixth Assembly consider campaigns against smallpox suitable for a worldwide program and requested the Director-General to submit to the Assembly a study for the execution of such a worldwide campaign. This study was to cover (1) a general program of *work* to be *implemented by WHO* and (2) the *estimated cost* to the Organization.

The Sixth Assembly (1953, WHA6.18) (9) responded by asking the Executive Board to study in detail the means of carrying out a worldwide program.

The 12th meeting of the Executive Board (1953, EB12.R13) (9) in turn requested the Director-General to consult with Member States, Regional Committees, and the Expert Advisory Panel on Smallpox regarding means and methods of making this study. (The reply from PAHO covering the regional commitment has been summarized above.)

The Seventh Assembly (1954, WHA7.5) (9) asked the Director-General to continue his studies on the most effective methods of smallpox control especially in endemic countries, to urge health administrators to conduct "where *possible and necessary* smallpox campaigns as an *integral part of the public health programs*" (italics added), and to help those countries asking aid "to further smallpox control programs." The concept of eradication had disappeared; a worldwide program "to be implemented by WHO" was out.

The Eighth Assembly (1955, WHA8.38) (9) succinctly urged "again that health administrators conduct, *wherever necessary,* campaigns against smallpox as an *integral part of their public health programs*" (italics added). No emphasis on eradication; no thought of coordination; campaigns *wherever necessary.*

The Seventh and Eighth Assemblies had turned away from smallpox eradication, thus the initiative of the two Regional Committees

and the Executive Board in 1953 came to nought.

No action was taken regarding smallpox eradication by either the Ninth (1956) or the Tenth (1957) Assemblies.

In 1958 the delegate of the Union of Soviet Socialist Republics presented to the Eleventh Assembly a resolution calling for the global eradication of smallpox (*10*). He stated this infection had been eradicated in the USSR for many years, but his country was still suffering reinfection from neighboring countries. He pointed out that it might be objected that massive vaccination required for eradication was possible only where there were *highly developed public health services*. He disagreed. The technique of vaccination could be taught in about a week to locally recruited people. In the Soviet Union 90 million people had been vaccinated in the years 1934-1935, which led to the eradication of smallpox as an endemic disease. Countries free of smallpox had to spend large sums in vaccination to provide protection against reinfection; the worldwide eradication of smallpox was a practical possibility with a minimal expenditure. The USSR had developed its own technique to produce freeze-dried vaccine; 25 million doses were offered to WHO to get the global eradication campaign started. The USSR calculated practical eradication as a five-year goal and complete eradication within ten years.

The USSR resolution was approved with only minor modifications (WHA11.54) (*9*) by the Eleventh Assembly. The Assembly resolution took up the problem of the worldwide eradication of smallpox in the near future.[3] It requested the Director-General to report on the financial, administrative, and technical implications of a program for the eradication of smallpox. This report was to cover investigation of the means of ensuring the worldwide eradication of smallpox, preparation of vaccine in national laboratories, training of vaccinators among local population, pooling of experience in the production of thermostable (freeze-dried) vaccine, and study of measures to prevent complications from vaccination. The Assembly recommended that all governments with *endemic foci vaccinate* their populations during 1959-1960; should smallpox persist, revaccinations should be given in 1961-1962 and in subsequent years, as necessary. The Assembly also recommended that countries where vaccination was compulsory continue to vaccinate during the eradication of smallpox throughout the world.

Although its timetable was not realistic, the action of the Eleventh Assembly was critical, in that for the first time WHO became committed to the global eradication of smallpox.

The Executive Board (EB22.R12) (*9*) in 1958 accepted gifts of freeze-dried smallpox vaccine from the governments of Cuba and the Union of Soviet Socialist Republics.

The Twelfth Assembly (1959, WHA12.54) (*9*) emphasized the urgency of achieving worldwide eradication and recommended *all endemic countries to organize* eradication programs as soon as possible. The Assembly requested the Director-General to offer necessary technical guidance and advice and also *"to provide for the necessary activities* to further smallpox eradication programmes and for the assistance requested by national health administrations for this purpose *in his program and budget for future years"* (italics added). (The Twelfth Assembly, as the Eleventh before it, made no reference to the organization of vaccination programs in the general health services.)

The Thirteenth Assembly (1960, WHA 13.33) (*9*) requested the Director-General "to continue to provide under the *programme and budget* of future years for the assistance requested by national health administrations in organizing and developing smallpox eradication programmes and for *all necessary activities* to further this end" (italics added).

[3] The draft resolution read "in the next four or five years."

The Fourteenth Assembly (1961, WHA 14.40) (*9*) noting that it was necessary to provide adequate material resources and advisory services to speed up the eradication program, recommended that the more *economically advanced countries* make *voluntary contributions* in cash or in kind to the WHO Special Smallpox Eradication Account.

The Fifteenth Assembly (1962, WHA 15.53) (*9*), noting that the progress made since the Eleventh World Health Assembly in 1958 took the decision to initiate a world-wide eradication program had been slow, invited *countries able to do so* to make *voluntary contributions* of such essential requirements as freeze-dried vaccine, suitable transport, and necessary laboratory and cold storage equipment. It requested the Director-General to provide *necessary activities* and *material assistance* in his *program* and *budget estimates* for future years and to *prepare with the aid of national governments their requirements and firm estimates* of cost for their smallpox eradication programs.

The Sixteenth Assembly (1963, WHA 16.37) (*9*), noting the slow progress of many national eradication programs due to the inadequacy of national resources, transport, equipment, and potent and stable vaccine, *invited Member States to make voluntary contributions to meet these deficiencies.* The Assembly also particularly urged the coordination of programs at national frontiers.

At the Seventeenth Assembly (1964) there was an attempt by the delegations of Australia, Chile, India, Liberia, the USSR, and the USA to strengthen the action of WHO in the eradication of smallpox. These delegations proposed that the Seventeenth Assembly request the *Director-General* "(1) to prepare a *comprehensive plan* for the *world-wide eradication of smallpox,* which will include *staffing requirements,* methods of procedure, provision of necessary supplies and equipment, including vaccine, *proposed time schedules,* and *estimates* of *current and future costs to WHO and to governments;* and (2) to include that *portion of the necessary financing* which is an *appropriate WHO responsibility* in his *estimates* for the *1966 regular programme and budget*" (*11*) (italics added).

The discussion of this proposal in the Seventeenth Assembly may well have been the turning point in the global eradication campaign. It led to a request by the Assembly to the Director-General (WHA17. 43) (*9*): "(1) to prepare a further comprehensive plan for the world-wide eradication of smallpox; (2) to provide, under the future regular programme and budget of the Organization—*if necessary at the expense of lower-priority activities*—for making good the shortfall of the vaccine required, and of other essential supplies and equipment, to countries developing eradication programmes . . ." (italics added). This request was the most important part of a lengthy resolution covering technical and supply matters related to smallpox eradication.

In 1964-1965, in complying with the request of the Seventeenth Assembly, smallpox eradication campaigns in four anonymous countries—two in Asia and two in Africa—were evaluated by WHO. Visits to these countries revealed a number of difficulties, among which was the fact that some health authorities did not consider smallpox to be a high priority health problem; added to this, the lack of trained staff, of equipment, and of vaccine created a most difficult situation. Also, in some places there simply did not exist the administrative authority for proper supervision of vaccination campaigns. From this evaluation it was obvious the stage of development of the health services from the center to the periphery should determine whether eradication would be carried out by a special campaign or as a supplement to existing health services. The field visits showed that far greater outside assistance was needed, particularly from the non-endemic countries, than was available. Un-

less resources became available for simultaneous regional campaigns in contiguous areas, provision for continuing vaccination programs indefinitely in each "eradicated" country would have to be made.

The Eighteenth Assembly (1965, WHA 18.38) noted, in spite of some progress on smallpox eradication, the continued existence of major endemic foci in Asia, Africa, and America, and the Director-General's estimate of the need for spending from international sources a total of $23.5 to $31 million *during the next ten years*. The reaction of the Assembly was to declare the *worldwide eradication of smallpox to be a major objective of WHO,* request all endemic countries to initiate or intensify smallpox campaigns, request support and *contributions from all sources,* request *bilateral programs* to include smallpox eradication, and request "governments to take early steps to establish *basic health services for the maintenance phase,* which should also serve for the *eradication of other communicable diseases*" (italics added).

The Assembly requested the Director-General to "make available the increased amount of technical guidance and advisory services necessary to accelerate the program, as well as to assist countries in obtaining the necessary vaccine, transport, and other equipment, and to report on the progress achieved to future sessions of the World Health Assembly." The Director-General was also "to seek anew the necessary financial and other resources required to achieve world-wide smallpox eradication with special reference to resources that might be made available through *voluntary contributions* and *bilateral programmes* as well as through programmes such as those of *UNICEF* and the *United Nations Expanded Program of Technical Assistance.*"

In 1966 the Executive Board (EB37.R16) (*9*), emphasizing the fact that all countries would have a long-term savings advantage after the global eradication of smallpox, considered it justifiable to pay for the participation of WHO in the eradication program through the regular budget of the Organization. (This in effect was a proposal for a proportional tax on all Member States for the final drive against smallpox.)

The Nineteenth Assembly (1966, WHA 19.16) (*9*), noting that the coordination of national smallpox eradication programs was essential to success and accepting the recommendation of the Executive Board, decided that *WHO's participation in the eradication program should be financed from the regular budget of WHO.* After once more urging countries to initiate and strengthen eradication programs as soon as possible and requesting Member States and multilateral and bilateral agencies to provide adequate support for these programs, the Assembly decided specifically that the following items could be charged either to the *regular budget* or to the *Special Account for Smallpox Eradication:*

"a. *Such supplies and equipment as are necessary* for the effective implementation of the program in individual countries;

"b. *Such services as may be required* in individual countries as cannot be made available by the government of such countries" (italics added).

The Nineteenth Assembly then requested the Director-General, "in cooperation with all members, *to initiate action to carry out a worldwide smallpox eradication programme* and to submit a report to the Executive Board at its 39th session and to the 20th World Health Assembly" (italics added). At long last the Assembly took strong measures in direct support of smallpox eradication.

The action of the Nineteenth Assembly resulted in what is known as the WHO accelerated, or intensified, program for the eradication of smallpox. WHO itself set up a special Smallpox Eradication Unit at headquarters and greatly increased the funds available to the Regional Organizations. The United States collaborated with 19 countries of West and Central Africa on combined

measles and smallpox vaccination campaigns. The USSR contributed large amounts of vaccine bilaterally and made 75 million doses available to the WHO. Even UNICEF was brought into the program to supply necessary equipment for certain programs.

The Twentieth Assembly (1967, WHA 20.15) (9) requested the Director-General to elaborate and implement the detailed plan of eradication, coordinating all international, bilateral, and national efforts to achieve global smallpox eradication *in a predetermined time.*

The Twenty-First Assembly (1968, WHA 21.21) (9) recognized once more the need for full and active participation by all endemic countries if eradication was to be achieved and for the maximum of coordination of their efforts. The Assembly once more urged countries having smallpox and no eradication programs to give the highest possible priority to the provision of funds and personnel to achieve eradication. It also urged countries where eradication programs were making slow progress to intensify their efforts. Requests were made for countries where smallpox had been eradicated to maintain a high level of immunity in their populations. It requested all Member States to give greater support through contributions of vaccine and transport. Member States providing bilateral aid were requested to include smallpox eradication in their programs. Special emphasis was to be placed on the *complete reporting of smallpox* cases and the *institution of active containment measures* for each recognized outbreak.

The Twenty-Second Assembly (1969, WHA22.34) (9) noted once more that significant progress in smallpox eradication was being made, but that some endemic countries were not proceeding at the pace needed to assure success in the global effort. It once more recognized the need for full and active participation of all endemic countries, for maximum coordination, for complete and prompt reporting, and for improved surveillance and containment techniques. The Assembly specifically requested that countries with endemic smallpox, particularly those with nomadic and mobile populations, strengthen their programs, particularly with relation to surveillance, case investigation, and containment measures in each outbreak. The Director-General was once more requested to continue to take all necessary steps for achieving smallpox eradication as quickly as possible and to continue with progress reports to the Executive Board and to the Assembly.

The smallpox eradication resolution of the Twenty-Third Assembly (1970, WHA 23.46) (9) was, as usual, repetitive but nevertheless significant. Reference was made to the "countries of western and central Africa," areas long considered by some as the most probable final reservoir of smallpox to be conquered. These countries had virtually succeeded in interrupting smallpox transmission after only three years intensive vaccination.[4] Special comment was made of the importance of *surveillance* and the need of investigation and *containment* of all outbreaks found. This emphasis on surveillance and spot elimination of infection was a new development since 1968. Specifically, the Director-General was requested to contact those endemic countries not yet conducting eradication programs to determine *what assistance might be required to permit them to undertake such efforts.*

The Twenty-Fourth World Health Assembly (1971, WHA24.45) (9) clearly had imminent victory in mind in the preparation of its annual action on smallpox eradication. Noting that endemic smallpox was then present in fewer than ten countries, believing that an intensified effort would accomplish global eradication, and convinced that improved reporting and containment were of vital importance in the interruption of smallpox transmission, the Assembly requested that all countries give priority to improving

[4] No mention was made of the preexisting bilateral measles vaccination campaign in this area, which constituted the administrative framework for smallpox vaccination.

case reporting and the investigation and effective containment of all outbreaks of smallpox. The Assembly once more urged Member States to provide additional assistance to endemic countries to bring about intensification of current programs.

PAHO and Smallpox, 1971 [5]

The PAHO program for the eradication of smallpox in the Americas was not sidetracked but rather supplemented by the WHO program after 1958. The governing bodies of PAHO faithfully supported the program throughout its entire course. A single example of the work of the Directing Council of PAHO acting also as Regional Committee of WHO for the Americas must suffice. The 1965 action of the Directing Council (CD16.30) (*7*) loses nothing by comparison with that of the Assembly (WHA18.38) (*9*) the same year. The Directing Council resolved to declare the eradication of smallpox in the Americas a major objective of PAHO, to "remind the Governments that the organization and execution of national smallpox vaccination programs is a *specific obligation incumbent upon them*" (italics added), to urge the Governments to intensify epidemiological surveillance services for early detection to prevent the spread of smallpox, to request the Director to prepare an estimate of the financial and other resources needed by "the countries and the Organization" for the eradication of smallpox, to emphasize the necessity of continued PASB coordination of national vaccination campaigns and of provision of help needed, "including technical assistance in planning, *operation,* research, and personnel training, as well as vaccine, supplies and equipment, and *certain local costs,* whenever necessary" (italics added), to urge Governments to supply programs of other countries with vaccine, financial and other resources, and specialist services either directly or through the PASB.

North and Central America and the West Indies have been free of endemic smallpox since 1954; South America has had no reported cases since early 1971. The success of the tremendous Brazilian effort was recognized by the Directing Council in 1971.

The End of Smallpox

The global battle against smallpox has not yet been won, but the demonstration has been made, the mechanism for finishing the job exists. The importance of early success in the eradication of smallpox cannot be overestimated. The situation is critical; speed is essential; the task must be completed before immune populations become susceptible and infection of "eradicated" regions recurs. Though the cost of completing eradication in certain areas may seem excessive, whatever the expense the per capita cost for the protection of future populations will be minimal.

Even though there are great difficulties ahead in some of the residual endemic areas, there is adequate capacity in the world to get the job done quickly: experienced administrators, epidemiologists, and facilities for production of potent freeze-dried vaccine. In the absence of unexpected political complications, the next few years should see the end of endemic areas capable of maintaining smallpox infection.

Always on the ultra-conservative side, let us predict smallpox as but a memory before 2000 A.D.

Epilogue

The responsibility for some of the delay and much of the credit for final victory in smallpox eradication belongs—I think we can agree—to the World Health Assembly. Of course the Assembly does not act in a vacuum. Proposals for Assembly action may originate with Regional Committees, Regional Directors, the Director-General, the

[5] An excellent summary of the smallpox story in the Americas is found in *Smallpox Eradication,* XX Meeting of the Directing Council, PAHO CD20/6, 23 August 1971.

Executive Board, or Delegates to the World Health Assembly itself. The exercise in tracing the action of the governing bodies has been particularly valuable in revealing how important the World Health Assembly is as an educational institution; the teachers and the students are the same—the leading health authorities of the nations of the world. All learn from each other and from the cumulative experience of WHO. The Assembly is at the same time a legislative body composed largely of administrative officers, who themselves have a most important part in carrying out the recommendations of the Assembly in their own countries.

The repetitive resolutions of the World Health Assembly may seem quite monotonous in their reiteration of some of the same recommendations year after year. This is advantageous, considering the constant change in membership. Annual resolutions keep the current membership involved in executing its own recommendations. They also permit gradual modifications of the resolutions themselves without cancellation or revision of previous resolutions: each year a new mandate.

In the long struggle with smallpox, the Assembly proved itself flexible, shifting ground as necessary and accepting previously unacceptable responsibilities. The Assembly's approval of a broad approach to WHO participation in smallpox eradication stands as a precedent for future programs. WHO is no longer bound by its early limited role of technical adviser, trainer, and provider of minimal supplies. The mandate of the Assembly to do what was needed and get on with smallpox eradication cannot be erased from the record. It should greatly influence the development of international health activities before entry into a new century.

Summary

In 1922 the *Boletín* predicted the Pan American Sanitary Bureau would stimulate local health authorities in the Americas to completely eliminate contagious diseases. In 1972 the anticipated success of the WHO global campaign for the eradication of smallpox promises to influence the eradication of other communicable diseases in the 21st century. This influence will be due not only to the demonstration of the possibility of global eradication but also because of the increasing initiative and power of the World Health Assembly.

Resolutions of the World Health Assembly from year to year reveal an increasingly powerful pressure on the endemic countries and on the Secretariat of WHO to give smallpox eradication the highest priority. As unexpected difficulties arose in the eradication of smallpox, the World Health Assembly abandoned certain strongly held tenets. Among these was the conviction that all special campaigns should be carried out through the general health service; financing was to be with extra-budgetary funds raised through special contributions. The eventual program developed called for special smallpox eradication campaigns and the utilization of regular budget funds of the World Health Organization.

The flexibility and the determination of the Assembly have been essential factors in the development of the global eradication precedent.

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(*12*) Pan American Sanitary Bureau. *Report of the Director of the PASB, January 1947-April 1950.* Washington: PASB, Doc. CSP13/6, pp. 102-105, 1950.

La salud internacional en el año 2000 (*Resumen*)

En 1922 el *Boletín* pronosticó que la Oficina Sanitaria Panamericana estimularía a las autoridades locales de salud de las Américas a eliminar totalmente las enfermedades contagiosas. Transcurridos 50 años, el éxito previsto de la campaña global de la OMS para erradicar la viruela promete influir en la erradicación de otras enfermedades transmisibles en el siglo XXI. Esta influencia se deberá no solo a la demostración de la posibilidad de la erradicación global sino también a la creciente iniciativa y fuerza de la Asamblea Mundial de la Salud.

Las resoluciones de la Asamblea revelan, año tras año, una presión cada vez más fuerte sobre los países endémicos y sobre la Secretaría de la OMS, para que concedan la más alta prioridad a la erradicación de la viruela. Cuando surgieron dificultades inesperadas en la erradicación de la viruela, la Asamblea Mundial de la Salud abandonó ciertos criterios firmemente sostenidos. Entre ellos la convicción de que todas las campañas especiales debían llevarse a cabo por conducto de los servicios generales de salud y que el financiamiento tenía que efectuarse con fondos extrapresupuestarios reunidos mediante contribuciones especiales. El desarrollo del programa exigió, oportunamente, campañas especiales de erradicación de la viruela y la utilización de fondos del presupuesto ordinario de la Organización Mundial de la Salud.

La flexibilidad y la determinación de la Asamblea han sido factores esenciales en el desarrollo de actividades anteriores de erradicación global.

A saúde internacional no ano 2000 (*Resumo*)

En 1922 o *Boletim* preveu que a Repartição Sanitária Pan-Americana estimularia as autoridades locais de saúde nas Américas a fim de eliminar completamente as doenças contagiosas. Em 1972 o sucesso antecipado da campanha para a erradição da varíola, promovida pela Organização Mundial da Saúde, promete influenciar a erradicação de outras doenças transmissíveis no século XXI. Essa influência será devida não só a demonstração da possibilidade de erradicação universal mas também pela iniciativa e força crescente da Assembleia Mundial da Saúde.

As resoluções da Assembleia Mundial da Saúde revelam, ano a ano, uma crescente pressão poderosa nos países endemicos e no Secretariado da OMS para dar a erradicação da varíola a mais alta prioridade. A medida que apareceram dificuldades na erradição da varíola, a Assembleia Mundial da Saúde abandonou certas políticas que mantinha firmemente. Entre essas estava incluída a convicção que todas campanhas especiais deveriam ser conduzidas através do serviço geral de saúde e o financiamento deveria ser através de recursos extra-orçamentários arrecadados através de contribuições especiais. O programa eventual desenvolvido requereu campanhas especiais de erradição da varíola e a utilização de recursos orçamentários regulares da Organização Mundial da Saúde.

A flexibilidade e determinação da Assembleia tem sido fatores essenciais na promoção da erradicação internacional da varíola.

La santé internationale en l'anée 2000 (*Résumé*)

En 1922, le *Boletín* prédisait que le Bureau sanitaire panaméricain amènera les autorités sanitaires locales des Amériques à éradiquer complètement les maladies transmissibles. En 1972, le succès attendu de la campagne d'éradication de la variole, organisée par l'OMS, laisse prévoir l'éradication d'autres maladies transmissibles au cours du XXIe siècle. Ces résultats ne seront pas seulement attribuables à la mise en évidence de la possibilité d'une éradication globale mais également à l'initiative de l'Assemblée mondiale de la Santé et aux moyens croissants dont elle dispose.

Les résolutions adoptées chaque année par l'Assemblée mondiale de la Santé révèlent une pression croissante exercée sur les pays d'endémicité et sur le Secrétariat de l'OMS afin qu'ils accordent la priorité la plus élevée à l'éradication de la variole. Du fait que l'éradication de la variole s'est heurtée à des difficultées imprévues, L'Assemblée mondiale de Santé a abandonné certains principes auxquels elle était fermement attachée, notamment la conviction que toutes les campagnes spéciales devraient être entreprises par l'intermédiaire des services de santé publique et le financement assuré avec des fonds extrabudgétaires au moyen de contributions spéciales. Le programme définitif qui a été élaboré prévoit des campagnes antivarioliques spéciales et l'utilisation de fonds du budget ordinaire de l'OMS.

La souplesse et la détermination de l'Assemblée ont été des facteurs décisifs dans l'organisation des campagnes d'éradication globale.