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STATEMENT BY DR. CARLOS A. ALVARADO, CHIEF
OF THE COORDINATION OFFICE OF THE MALARIA
ERADICATION PROGRAM (COMEP)

Mr. Chairman, Gentlemen: May I first of all tell you with what deep satisfaction my organization has heard the statements by the representatives as to the status of the programs in their respective countries. This is an event that will undoubtedly be memorable in the annals of malaria eradication history in the Americas, since the word "eradication" has for the first time emerged from the restricted sphere of specialists to become a current word in the language of the public health representatives of all the countries. And it has not been used just as a mere word, but with discrimination, inasmuch as conditions have been described showing how deeply this word has penetrated into the consciousness of those responsible for public health.

I hope also that you will permit me, at the outset, to present my apologies to the representatives of those countries that have found discrepancies between the figures given in our documents and those that they have on the work done in each country. I want to apologize especially to the Representative of Colombia, and say, if I may, how glad I am that this clarification was necessary. For nothing can give us greater pleasure than to find that in a given country matters are progressing under even better conditions than we had realized. The problem of malaria in Colombia is, as you know, very great. It is second in magnitude to that of Mexico in the Americas. If Mexico yields that position as a result of its large-scale eradication program, Colombia then will occupy first place, and consequently the malaria situation in that country, or the situation of that country with respect to the continental problem as a whole, is of exceptional importance to the eradication of malaria in the Western Hemisphere. At present Colombia's problem represents 13% of the continental problem--if the campaign in Mexico is successful, the figure will rise to 28%. Hence the situation in that country is one of no minor importance. May I apologize again and say how glad I am that an error or mistake, or a failure of evaluation on our part, has brought about so complete, so spirited, and so well documented a clarification; I could almost say that I am struggling with my conscience not to conceive the wicked idea of deliberately altering one or another figure in the future in order to create a situation that will give us another such valuable report and lesson.

I am going to give a brief history of the events leading up to this continental eradication program. As the result of Resolution XLIII of the Conference in Santiago, Chile, the Director of the Bureau and I were invited by UNICEF to present a general outline of the philosophy and the strategy of the continental eradication program. Shortly thereafter, on 1 April, the Bureau decided to organize and set up definitively and concretely an office charged with coordinating eradication activities throughout the Americas, and, as you know, the office, with headquarters in Mexico City, was named Coordination Office of the Malaria Eradication Program and is referred to as COMEP, from the initials of its English title. In May the Joint Committee on Health Policy, composed of members of the WHO and UNICEF, met in New York to lay down the conditions under which UNICEF was to collaborate in the eradication programs. A decision of considerable importance was reached then, and I am going to read the main points of the recommendation made by this Committee, because I consider them of basic interest to the countries. I am going to quote them directly in English.

"...The achievement of malaria eradication requires total control in all areas where transmission of malaria occurs...(No. 10). The Committee believes that new antimalaria projects should aim at eradication and that the requesting country should be expected to have or to establish for such period as may be necessary an adequate central antimalaria organization for the implementation, coordination, and guidance of the national program; should promote the necessary supporting legislation and should pledge the financial support for the duration of the program. UNICEF, on the other hand, should endeavor to continue its assistance until the termination of the program...(No. 11). The Committee recommends that UNICEF give highest priority to the support of malaria eradication programs."

The Regional Director of UNICEF for the Americas is present and will undoubtedly want to comment on the UNICEF participation in this program. After the meeting of this Committee, our Bureau undertook the task of studying the technical standards for the eradication programs, particularly those that require UNICEF's financial assistance. For this reason my office prepared a certain number of documents that were submitted to an Advisory Committee for the Eradication of Malaria that the Director of the Bureau had decided to establish. The Committee was composed of the most eminent specialists in malariology in our Continent: Dr. Justin Andrews, of the United States; Dr. Arnoldo Cabaldón,

of Venezuela; and Dr. Manoel Ferreira, of Brazil. Dr. Paul Russell, the WHO Malaria Adviser, was also a member of the Committee. The first meeting took place on 2 June, when such important recommendations were made that I feel I should refer to them in greater detail. The documents to which I have referred have just been distributed (in Spanish only) and are identified by the symbol COMEP/ACME and the numbers 1, 2, and 3; there are also two charts to which I shall refer later. The first of these documents is entitled "Differences between a Malaria Eradication Program and a Malaria Control Program." Of course I shall not read the document, but I do wish to mention three or four points that are of fundamental importance. The first refers to the area of operations, point (b) of Document No. 1. The eradication program states "wherever there is transmission," Point (c) refers to the quality of the work and, for the eradication program, says "perfect"; transmission should become interrupted throughout the area. Point (h), on page 2, "Parasitological confirmation of all suspected cases," says "of supreme importance"; and point (k), which refers to the administrative evaluation of the development of the program, says of control programs, "measuring the work accomplished," and of the eradication program, "extent of what is still to be done." The Representatives of Brazil and Argentina have already referred to this fact, which will unquestionably have a great effect on the future reports on the status of the programs. In an eradication program it is important to measure not what has been done but rather what remains to be done. This fact, gentlemen, will no doubt present a serious problem to malariologists -- we have been accustomed to achieving easy successes by measuring our past accomplishments, because the residual-action insecticides placed at our disposal easily produced such spectacular results that we were able to enjoy a prestige won at little cost by reducing a parasitic index from 80% to 1% in two years of application. This is no longer true, as we all know, with respect to an eradication program, where it is not at all important to determine the initial magnitude of malaria in order to initiate operations; it is enough to determine its presence. This Document No. 1 contains categorical definitions as to what should be understood by an eradication program. It was essential for all these points to be made very specific, so that there would be no misunderstanding of what "eradication" means.

The second document deals with the evaluation of the malaria eradication programs -- objectives, methods, and procedures. Allow me to take a few minutes to explain the philosophy of this paper. We all know that in control programs evaluations have always been made on the basis of the number of houses sprayed;

inhabitants protected; square meters covered; and the amount of DDT used. As we have already seen, these words no longer have any meaning in an eradication program, except for keeping account of the operations, for the internal use of the service, so as to permit an appraisal as to whether, from an operational viewpoint, the work is being carried out properly or not. The basis for the evaluation of eradication programs will be the existence of new malaria cases.

Document No. 3 refers to the charts that were distributed with the documents. This requires a brief explanation. Chart No.1, Table A, shows the chronological order of the spraying operations. These operations have two basic characteristics: first, the time within which they should be carried out ought to be well established; they have, we might say, a strictly defined period. Second, the funds for the operations are also limited, since they have to be estimated on the basis of the total expenditures for the duration of the program. It is, therefore, essential that a system for developing and organizing the operations be established, and, at the same time, that this system be adapted to a schedule.

With this philosophy, the Committee decided that an eradication program should be developed in two basic stages. The first, which might be called eradication in the true sense of the word, refers to the time when large-scale spraying operations are carried out in order to interrupt the transmission completely. The second stage is that of vigilance and the prevention of reinfections. During the first stage, that of eradication, spraying and evaluation operations should be conducted with the same intensity, the same exhaustiveness. You will note that the Committee advises that the evaluation operations merit, on the part of those responsible for the service, the same attention, the same interest, as do the spraying operations, whereas in the past the fundamental interest of those responsible for the execution of an antimalaria program was exclusively, or almost exclusively, in the application of the insecticide.

For the spraying operations, three stages, or periods, were established. The first is that of development, expansion, or conversion, during which a control service should be made into an eradication service. Dr. Soper used a very useful expression yesterday, which I shall repeat now. An eradication program is not merely the extension of a control program -- it is the transformation of it. Other representatives, I believe it was the Representative of Brazil, also referred to this fundamentally important point. This transformation, of course, requires a

period that may last for months or for a year, according to the pre-existing conditions of the malaria service and the control program.

When this period has elapsed, the second period begins, the one of total coverage, which, as some of the representatives too have stated, means many things. It means that all the houses in the transmission area should be sprayed -- every single one of them. And they should be well sprayed, sprayed in such a way that transmission is interrupted from the very beginning, and contact should remain broken until the sources of infection are exhausted, so that when this has happened, the sprayings can be discontinued without any danger of the re-establishment of endemicity. This period of complete, of total, coverage will last from three to four years, according to conditions, which are described in the same document.

The third period is that of suspension of the spraying operations. Chart No.2 deals with evaluation operations: reporting and registration of cases, parasitological verification of all cases, parasitological indices in individuals with fever, questioning, and epidemiological surveys in each and every instance. What each of these means is explained in Documents Nos. 2 and 3. The Representative of Brazil made an interesting reference to the practical value of parasitic indices in individuals with fever. As you can see, the first point in the evaluation operations is the reporting and registration of cases, a factor that until recently had no value whatever in our control programs. Charts 3 and 4 refer to supplementary operations and other responsibilities that are self-explanatory, and therefore I need not take up more of your time with them.

These documents should be considered as practical guides for the organization and development of eradication programs. However, the Advisory Committee took other points into consideration. The Joint Committee on Health Policy had decided that UNICEF assistance should be given only when an efficiently organized antimalaria service was already existing; hence the need to define what should be considered as an efficiently organized antimalaria service. After giving the matter considerable thought, the Committee declared that it was impossible to define for all countries how an adequately organized central service for the eradication program should be set up. The Committee did, however, stipulate a few requirements considered absolutely indispensable for carrying out such programs. These were as follows: first, that such a service should occupy a primary place in the public health services, equivalent to that

of a high-level administrative division. Second, the service should be headed by a specialist serving on a full-time basis and having complete authority to carry out all technical and administrative activities required. Third, the necessary facilities for diagnosis should be provided or existing ones improved, so that during the eradication campaign all suspect cases of malaria can be confirmed by parasitological test. Fourth, there should be a properly, qualified staff, sufficient in number and adequately remunerated, to devote their full time and energies to the task of carrying out the program.

There has been an interesting discussion on the question of the number of professional personnel considered adequate to enable the antimalaria service to cope with the problem. Studies were made on the number and quality of personnel in the existing services of countries like the United States, Venezuela, Brazil, and Argentina, where satisfactory operations had been carried out; the minimum figures given for the services in Brazil and Venezuela, respectively, were 2.8 and 3.9 professionals on the malaria service staff for every 100,000 sprayings. Seeing that it was impossible to give a concrete suggestion on this point, it was agreed to take the above ratios as minimum figures, especially in view of the fact that the Representative of Brazil, then Chairman of the Advisory Committee, stated that the ratio of 2.8 professionals per 100,000 sprayings was considered insufficient in his country for carrying out the eradication program, and that he would attempt to have this number increased so as to develop a staff of the proper size and quality to face the new responsibilities.

Another of the requisites established for an efficient antimalaria service was an adequate budget. The Committee also considered the problem of legislation. It will be remembered that the Joint Committee on Health Policy ruled that supporting legislation would be necessary. It was also necessary to define what the purpose and the fundamental provisions of such legislation should be. The Committee decided that the legislation should include: compulsory notification of all malaria cases; authorization to take blood samples for parasitological tests; authorization to enter homes to carry out entomological surveys and, above all, sprayings with insecticides; authorization to impose control over immigrants; authorization to obtain and to administer the required funds.

Another point brought to the Committee's attention was the need to establish recommendations as regards delineation of malaria-infested areas. The old school of malariology had a set

of orthodox rules by which it could be determined accurately where malaria transmission occurred. But these old regulations proved too complicated and too expensive for the purposes of an eradication program, in which it is not a question of measuring the extent of malaria in a certain region, but simply of determining whether it is present. In this connection, the Committee recommended that it would be sufficient to make an exploratory survey limited to detecting persons with fever, through house-to-house visits, taking blood samples to verify the existence of transmission and substantiating these findings by making entomological tests to confirm the presence of the vector in the house.

With respect to insecticides, the Committee made two recommendations of fundamental importance. First, it was recommended that DDT continue to be used until proved inadequate to control transmission in a given location. Second, the Committee recommended forbidding the use of DDT as a larvicide, a recommendation that should be extended to cover the entire group of chloral hydrocarbons because their use is the surest and quickest way to build up resistance against insecticides in the anopheline vectors.

Another very important recommendation, the value of which has been commented upon by several representatives, is that, when the existence of residual malaria -- more properly called persistent malaria -- has been proved, this fact should not be attributed to failure of the insecticide until it has been shown that such insecticide was properly applied. May I stress this point a little more at length, because, as a usual thing, which we see happening everywhere, as soon as new confirmed cases of malaria appear in areas that have been sprayed, the staff members of the service claim that the insecticide is at fault or that people are sleeping outside their houses; that the house walls are too flimsy for the insecticide to be applied or, which is still more serious, that there is presumption that a certain degree of resistance is appearing in the anopheline vectors. In most of the cases in which this state of affairs has been studied, it has been possible to show that the situation was due exclusively to poor application of the insecticide, because of an incomplete application within the house, because there was too long a period between applications, or what is more frequent still, because of the failure to apply the insecticide in many houses in the area where such cases of malaria occurred.

The last recommendation of the Committee was to establish as a routine measure a service responsible for measuring the susceptibility of the Anopheles to the insecticides. You know

that there are very simple procedures, the Busvine and Fay tests, which can easily be applied. Our organization has already prepared practical recommendations to all the services on how to apply this observation as a routine measure.

I should now like to mention the status of the small organization called COMEP and what it is now doing. The first problem naturally was to set it up. It is not easy to find at this particular time employees qualified to take a direct interest in studying and working in malaria problems. As the Representative of Brazil has already pointed out, the signal success achieved in the early control campaigns made us malariologists believe that our era was over. And those of us who were still living, or half-way young, immediately began to worry about finding another activity so as not to be outdated, and those who had not yet begun their career of course thought malaria was a dead science and that it was not worthwhile to spend time, money, and effort in studying it. Fortunately for malariologists, conditions have changed, and we are now facing a golden quarter of a century. But this is happening only just now, and the group of malariologists qualified to become interested in this problem has not yet been trained. So far, our staff--which should comprise, in addition to the chief, an epidemiologist, an entomologist, a malariological engineer, and a parasitologist--includes only the entomologist and the sanitary engineer. Therefore, many of the difficulties in reaching the countries with the advice and counsel for the solution of technical problems cannot be overcome because of lack of personnel.

Another matter that has taken a great deal of time was the preparation of the program for the eradication of malaria in Mexico. You well know the importance and the magnitude of this problem. According to instructions from the Bureau, we should give this problem first priority. A result of this effort, in which the national personnel of Mexico performed so great a task, was the preparation of a volume that some of you have had a chance to see: the plan of operations for malaria eradication in Mexico. The compilation of background material, the study and classification of it, and then the detailed preparation of the plan of operations required a great deal of time.

The other point to which we are devoting our attention just now is the preparation of a handbook of technical standards, with general instructions that it is advisable to follow in preparing and carrying out an eradication program in the respective countries. The Office wants to prepare a handbook similar

to that now in use for the yellow fever work, especially for the eradication of Aedes aegypti. But we have met with the difficulty that malaria eradication presents a more complicated problem, one that covers very different fields from those dealt with in the eradication of Aedes aegypti, for which there is a technique and long-standing experience.

In addition to this, gentlemen, we have had to deal with technical problems, such as the study of the equipment needed for the antimalaria campaign. This is not a simple problem, for when a control program or programs for limited areas are carried out, the equipment that should be used is not a matter of major concern. But when it is a question of nation-wide eradication programs, and especially of programs that are going to be carried out throughout the Americas, equipment planning is fundamental. You know that the WHO Committee on Insecticides has issued complete specifications as to the requirements, for example, those for insecticide sprayers. A study of this matter by our engineer made it possible to determine that, to cite a single example, one of the spray guns considered as meeting all the requirements did not meet two major ones, and that later a number of other circumstances arose that made it necessary to review those specifications. As a result, our organization has decided that the technician should study the matter thoroughly, visiting factories and going to Geneva to discuss the point with the Expert Committee on Insecticides, which will meet early next October. This matter is of such great importance that I should like to explain what could happen. In the program in Mexico an average of 16,000 pounds of DDT will be used a day. A sprayer that does not work well, a nozzle that is faulty, will mean the loss of at least 10% of the insecticide. The losses that occur because of faulty equipment are considerable, and my figures are minimum ones. Ten percent of 16,000 pounds is 1,600 pounds of DDT, the value of which will amount to \$400,000 during the entire course of the program. It is very much worthwhile, then, for this problem of equipment, especially the problem of sprayers, to be thoroughly studied, not only in the interest of the service and the quality of the work, but also because of the importance of this problem to the agencies collaborating in this campaign, especially UNICEF, which so far has been providing the insecticide in the cooperative programs.

I shall take but one minute more of your time, gentlemen. An eradication program may be compared to a watch movement. The movement of the parts should be most precisely adjusted, so that the operations can follow the initial program regularly, one after the other, and the results can be measured in such a way

as to be discernible and comparable. This requires not only a devotion to detail on the part of the services and the authorities in every country but also a great interest and a great effort on the part of the international agencies entrusted with the responsibility of orienting and coordinating these programs. I can assure you that our group, our organization, is ready to carry out faithfully that task. Thank you.

II

STATEMENT BY MR. ROBERT L. DAVEE, REGIONAL DIRECTOR FOR
THE AMERICAS, UNITED NATIONS CHILDREN'S FUND (UNICEF)

Mr. Chairman, I should like first of all to express my appreciation of the honor of being permitted to speak at this meeting of eminent public health experts --many of whom are my friends-- from the national health services and from the Pan American Sanitary Bureau. The purpose of my remarks, which I should like to be brief although the topic makes a certain amount of detail necessary, is to report on and review our experiences of these past months, which have been devoted to the preparation of malaria eradication programs with the technical aid of experts from the WHO and the PASB. Although many of those present are aware of the fact, I want to inform you that yesterday afternoon the Executive Board of UNICEF, meeting in New York, approved a total of \$3,400,000 for malaria eradication programs. The total for these programs in 1955 will be \$4,000,000. The largest outlay is for Mexico, for which an allocation of \$2,400,000 for the first 18 months of the campaign was approved. This amount, and particularly the latter allocation, is certainly the largest sum ever approved by an international organization for a public health program. It is the result of the work begun last October at the meeting of this Organization in Santiago, Chile, and of the efforts of Dr. Soper and Dr. Alvarado. It is also a proof of the confidence these experts inspire. There is no doubt that the decision required a certain amount of courage, for you, as practical men, are well aware of the risks involved in campaigns of this type. Therefore the decision is of the utmost significance, because much of the future of international cooperation hinges on it.

What is our stand with regard to the future? The Executive Board of UNICEF gave its approval, in principle, to the preparation of malaria eradication programs throughout the world, up to a maximum outlay of five million dollars per year. Of this five million, we have already been authorized to assign three million to Latin America. If we were asked for the reason for this relatively privileged situation, we would say first of all that the main reason is that of all the world Latin America is the continent that has experts who can be considered among

the foremost, both as to personal qualifications and as to number. An additional reason is that the conditions of transmission by insect vectors and the general conditions throughout the malaria areas are also the best known in the world. However, the figures quoted show already that there will be certain limitations to our activities. We already have certain commitments with Mexico that we wish to honor. I cannot deny that certain figures I heard quoted this morning made a deep impression on me. It is unfortunate that we do not yet possess any criterion nor do we have any intellectual or administrative methods for selecting problems or establishing priorities. For example, at the beginning we had not included Brazil in the preliminary draft of our budget. The Delegate of Brazil on the Executive Board of UNICEF brought the problem to our attention and the Board decided that there was no real reason why a program of activities in Brazil, subject to certain conditions and limitations, should not be considered. This means that our task will be more complicated. I can see but two possible criteria. The first is the limitation of available funds, which sets up a certain barrier beyond which our budget estimates cannot go; the second, and slightly easier of achievement, is the technical improvement of the entire project. Dr. Alvarado has mentioned, in this connection, the work of the Joint Committee on Health Policy of the WHO and of UNICEF, and I therefore need not go further into the matter. I should merely like to remind you that the three fundamental criteria established by that Committee for judging the effectiveness of a project: (a) that the country have an administration especially or exclusively to deal with malaria; (b) that it possess legislation specifically on malaria; and (c) that the national budget include the funds required for conducting a true eradication campaign. I should like to supplement the information and data furnished by Dr. Alvarado on two or three points, which, while relatively minor, are quite important in practice.

The experience with the Mexico plan in particular, shows that it is also important--and I believe Dr. Alvarado did not mention this--for the administration to have a certain flexibility in its budget. Mexico is going to establish an independent administration, with a National Council on Malaria Eradication. The country has also created a fund with a special legal basis that will permit flexibility in the handling of budgetary funds and allocations; it will probably be possible to transfer funds received within one year to the next year, without their being subject to the limitation that they be expended during

the fiscal year, as is true in certain countries, Brazil for example, a limitation that is such a handicap to the smooth execution of a campaign. The precedent established in Mexico is therefore, from that point of view, extremely valuable for the whole malaria eradication project.

With respect to matters more directly related to UNICEF, which occurred to me while Dr. Alvarado was speaking, there are two important factors; vehicles and insecticides. The problem of vehicles has always been a critical one in UNICEF campaigns in Latin America and it will be particularly so in the malaria eradication campaign. In the case of Mexico, UNICEF's capital investment for vehicles will be one million dollars. This is an enormous, almost colossal amount when speaking of public health campaigns. It is our hope that this fleet of vehicles will last for the duration of the campaign, and the Government has made the commitment that they will. Such a fleet will require special regulations on driving, maintenance, repair shops; in a word, a whole series of regulations will be necessary and we are counting on them heavily. Should the Mexican campaign show any sign of failure on this score, there is no question but that it would discourage us from undertaking additional campaigns in other countries.

I should like to point out to the professional men here that it is not advisable to request excessive amounts of insecticide from UNICEF at any one time. Experience in the various countries has shown that the storage of large quantities for long periods weakens the potency of the insecticides, even though they complied perfectly with WHO specifications at the time of purchase.

Another point, I should like to make, as the result of previous experience, is the matter of "surprises" -- surprises for the non-specialists, like myself, as well as sometimes even for the specialists. In the first place, we have learned to appreciate the importance of the epidemiological service in the malaria eradication campaign, and of the evaluation service as well, and there is no doubt that these entail certain supplementary expenditures in the national budget estimates. A surprise that perhaps will never disappear, one that perhaps we find rather bitter is the concept of the extent of the malaria-infested area.

I, for my part, fear that when we have a more exact idea of the extent of the malaria-infested area, some programs will far outgrow the preliminary budget estimates of the national governments and of the international agencies. In this connection Dr. Alvarado and Professor Ferreira have already stressed the necessity of complete 100% coverage. There are, for instance, the areas of low endemicity that were disregarded in the control campaigns and will have to be included in the eradication campaign, a factor, I believe, that will increase considerably the budget of any eradication campaign. Finally, another difficult point arises when making the distinction between a control and an eradication campaign. I was pleased to hear Dr. Soper's phrase, quoted by Dr. Alvarado, that "an eradication campaign is not a continuation of a control campaign but rather the transformation of the latter into eradication," and I am afraid that this fact, too, is a bitter surprise to some countries. Consequently, we have on the one hand - I do not wish to sound pessimistic as in reality we have just made decisions of an optimistic and confident nature - the prospect of future budgetary limitations, and on the other, we can foresee an increase in the expenditures that were estimated a few months ago. In view of those limitations, it is difficult to decide what the best strategy would be.

There is a geographic criterion, with which we have started working in Mexico. The geographic strategy consists in starting eradication at the border of a country already free from malaria, the United States, and continuing it down to the narrow strip that ends the area on the Isthmus of Panama. We shall add to this part of the hemisphere the islands of the Caribbean, where everybody agrees that eradication is feasible. This would provide, if I might suggest a time schedule, a sort of work plan, let us say Central America in 1956 and South America in 1957. This is, of course, only a planner's suggestion, which might not fit in at all with conditions in a given country; I mention it only to state what the point of view might be of one who has to take part in continental planning.

On the other hand, I think we could use our imagination and try to find certain criteria and certain rules of strategy in planning. For example, one point that has impressed me is the fact that two malaria eradication programs presented to this Meeting showed completely different cost estimates. One program estimated the per capita cost at \$0.25, while the other set the figure at \$0.40. This morning I heard of an estimate for Colombia that gave a cost of \$4.40 per house for two annual sprayings, if I am not mistaken, and if I am, I should appreciate

being set right on this important point. Yet according to estimates for eradication campaigns carried out in the United States in 1948, the cost per house was \$3.50, which apparently means that Colombian estimate is high. According to my estimates, the cost for Mexico will be \$1.25 per house. We have here cost differences that are evidently due to specific conditions in each country, such as cost of living, wages, and other factors that have to be taken into consideration. There is a whole scale of different costs and it would be to the common interest to find an average one that would be economically sound; in this respect, on the basis of the experience of Mexico, I can think of three phases of the work in which economies might be achieved. The first is the output of the men who do the spraying, and this is a matter in which UNICEF can be of assistance, inasmuch as the supply of vehicles raises their output considerably. For example, in reviewing recent programs we found that in Mexico one man can spray ten houses per day and in other programs in El Salvador we have an output of 6 1/2 per man-day. Of course, here too there is a certain margin, a certain difference, which finds expression in higher or lower costs for the interested government. Another aspect is the use of Dieldrin instead of DDT, by which I do not mean to recommend one insecticide in preference to another. We have the experience of Venezuela, Guatemala, and Mexico, and wherever it is possible to spray twice a year, the use of Dieldrin is undoubtedly more economical than DDT. Finally, there is the barrier technique introduced by Dr. Alvarado in the Mexican program which, when taking into account the final total of houses protected, constitutes a real saving of 20%. This is a very delicate point, which in itself might justify setting up a sort of "working party".

It is unfortunate that we all are too busy, but I think that the governments might give considerable help to international efforts if they took upon themselves what Dr. Alvarado calls the preparatory year. The preparatory year, in the case of Mexico, represents a large expenditure, particularly for UNICEF; of course if we did not have to make expenditures for this phase of the work in other large-scale programs where, in my opinion, such action is possible -- especially because those countries are ones where malaria is not a new problem -- that would be one way of making the limited funds at our disposal stretch as far as possible. But as a matter of fact, this is not the most delicate point. The most delicate point is the question to what extent is it possible to utilize what has already been done under the philosophy and techniques

of control when that program is transformed to an eradication campaign. On this point the experts are uncompromising. As a matter of fact--and this is the meaning of the "transformation" of a control campaign to an eradication campaign--the work of control, to put it bluntly, counts for very little when an eradication campaign is undertaken. And when the experts conceive of an eradication campaign, in most cases they conceive of it as meaning the obligation to repeat for three or four years exactly what has already been done, but to an even greater extent, since eradication must include the areas of low endemicity that were often disregarded in the control campaigns. This is the point that causes us the greatest concern. I am saying this here because of our confidence in the experts who have accepted the conclusions I have just given; but I should like to suggest the following point for you to mull over: See if it would be possible for the areas that were properly treated during a well-conducted control campaign to have reached the point in the time schedule where spraying can be interrupted. As I am not a specialist, I only state the problem; I do not solve it.

Finally, in my concluding remarks I ask your pardon if I speak too frankly. UNICEF funds are going to be short; if we want to go beyond the limit that we are authorized to set, for the present, for the Latin American countries, I am convinced that we shall have to receive greater aid from Latin America. UNICEF is a world organization; we have to keep a certain equilibrium, and we have to follow a certain philosophy of justice. Nor can we destroy the balance of our programs. In many cases it would be a great shame, if, in order to make a special effort to combat malaria, we should neglect other highly useful campaigns, such as those being carried out against yaws and against leprosy, or certain programs of environmental sanitation. And in this connection, I should like to make two other observations. The first is my belief that today, in this field, we deserve the total cooperation of international organizations. The second is that, as a European, I was very slow in understanding the deep feeling, the historic force of Pan Americanism, and conferences like this have taught me a great deal. But also, at the same time, as a European and as an American, since I am bound to this Continent now by family ties, I should like to say how discouraged I was when I failed in the attempt to introduce the idea that Latin America can really make an effort to attain Pan American solidarity through UNICEF. This is the psychological moment, because we are starting a continental eradication campaign, and therefore my

plea is twofold: one, that we do not let ourselves be discouraged when occasionally faced with the situation that a country weighs its aid to us in the terms of our efforts in behalf of it. I am not disputing that philosophy, but I do dispute the fact that these terms are often very narrow. Moreover, and this is the second part of my plea, I should like to call upon the more fortunate countries of Latin America, which are precisely those that neither need nor request aid of UNICEF, to give thought to how, using what we are doing as the instrument, they can really help their brothers in Latin America.