

Summation of Conference

Dr. Skinsnes. It is now time for the scheduled summation. When I came as a student to the Department of Pathology at the University of Chicago Dr. Long's name was a legend. His name has long been known for his mycobacterial studies on tuberculosis. I think it will remain so in the International Leprosy Association, because of the excellent work he is doing on our JOURNAL. Dr. Long, are you prepared to summarize the conference?

Dr. Long. Dr. Skinsnes, there is some question in my mind as to what summation means. It has been referred to as a summarization. That word involves the concept of recapitulation, and I think that at this late hour recapitulation of all that we have heard during the last four days might be a painful experience. In his opening address Dr. Robert Cochrane, who ought to know, because he has traveled far, and for a very long time, said that much of the world's research on leprosy has been ill designed and uncoordinated. This conference, I may say, was set up in an effort to overcome part of the difficulty to which he referred.

It might be worthwhile to add a few words about the original design, and point out, also, that we have departed somewhat from it in the course of these four days. The conference was planned originally by Dr. Binford, as you all know, and too much credit cannot be given to him. He is a tremendous worker. We have seen him go back and forth all through this conference, apparently inexhaustible in his energy, and I might say that anyone who sees him at his daily work in the office or laboratory finds the same devotion.

The design of the conference was somewhat as follows: It has been mentioned several times by a number of speakers that a principal bottleneck in all leprosy research is our inability to cultivate the causal organism of the disease on artificial media so that it can be studied in the laboratory. Although some success has been

achieved, to which I shall refer in a few moments, it is to be hoped that methods for laboratory transmission of the disease, superior to those presently in use, can be found. It appeared to Dr. Binford's committee that it might be a good plan to bring together not only experts in the field of cultivation of the leprosy organism, but experts in other fields, particularly those concerned with organisms that were once hard to grow in the laboratory but were finally cultivated through the success of someone over what appeared at first to be almost insurmountable difficulties. That plan was followed, and, as you know, we had experts here from other fields. First we had a comprehensive picture of the metabolic characteristics of mycobacteria. Then our special experts presented their own work on other organisms, organisms that were once difficult to cultivate but finally yielded to new methods. Here and there, scattered through these reports, certain leads appeared, which will be followed by those now concerned specifically with culture of the leprosy bacillus. More important possibly even than the formal papers were the discussions that followed. I have a feeling, though, that the best discussions took place in the halls and the coffee room. We can never record these, but they may be quite as fruitful in their stimulation of future research.

Now, according to Dr. Binford's plan, interspersed among these talks on fundamental scientific laboratory experiments, were numerous papers by the world's leading experts in leprosy, dealing with its clinical course, pathologic nature, genetics, epidemiology, treatment, and other factors. To a certain extent this part of the program was to be for the benefit of those working intensively in highly specialized fields, who were not familiar with leprosy as a disease, a category, incidentally, that includes myself. Actually, as the conference developed, the talks on clinical, pathologic, and related factors in the disease, which were the

main ones today and the latter part of yesterday, have worked out so well that they almost overshadowed the original plan.

Now, if I may come back to the difference between summation and summarization—let me say that I sat here faithfully for four days, starting out by taking down what I thought was the nub of each paper. At six o'clock this morning I began to condense all those nubs. By eight I found I had 16 pages of condensed nubs, and I felt sure these should not be inflicted on a tired audience. So, to avoid any temptation to give that kind of a summarization, I left all those notes at home. Instead I shall speak more simply about a few matters that might be considered highlights. They will have to be few, time being limited, and what I shall say will fail totally to do justice to the magnificent papers given by many of you who are here. I must admit that I found some of the papers hard to understand, as I guess others among you did. However, all the papers will be reproduced in print. I look forward with some dread to unravelling the considerable amount of material that has been presented to us, but I hope that some of the queries still in my mind will be removed by what I find in the taped record. There was a very fine interchange of ideas.

Coming back to the question of cultivation of the organism, I note that much was said on enrichment of media, a normal first thought with reference to a growth medium. There was a good deal of emphasis also on the intracellular parasitism of *M. leprae*. In the discussion of intracellular parasitism as observed in tissue culture, beautiful results were shown. Remarkable growth was demonstrated. It seemed to be true growth, even though the speakers themselves used the word with great caution. To me their work appeared to represent a real break through in this meeting. I say that partly because of the enthusiasm with which the results shown to us were received. It was pointed out—and I am sure this is a matter of extreme importance—that the problem is not just a question of growing the organism within cells. How the cells themselves grow, and what fortification they acquire from other

substances in the medium around them, are matters of equal importance. Incidentally, some of the pragmatists here said if *M. leprae* grows in cells, why don't we study it in cells? In brief, I gathered that there will be increased emphasis in the future on tissue culture of the organism.

In the same connection this question was raised: if we are interested in *M. leprae* why not study *M. leprae*? Discussion of the pertinence of investigation of *M. lepraemurium* was at times a little heated. In that regard I may say that during the 50 years or more during which I have attended medical meetings, somehow or other I have acquired a semiofficial position as pourer of oil on troubled waters. I had some very pleasant discussions with Dr. Dharmendra and told him that he had at least made the lepromuriologists prove their point. I think they did that.

Another element in the conference that seemed to me to represent a breakthrough, was the acceptance by those present of the new microbial forms we have heard much about in recent years, sometimes called L forms or soft forms, as of true importance in the biology of the organism with which we are dealing. It seemed to me that the opportunities for further development are as great there as they are in the field of tissue culture. One thing only I dread. For years all sorts of queer particles, have been presented to us as the cause of this or that disease. Anybody who has ever had much experience as an editor knows that in the course of time many articles on such particles, some out on the lunatic fringe, will come to his desk. I fear that after our acceptance of the soft forms, which are highly variable, we may be faced with reports on all sorts of queer things in cultures of the organism. To distinguish what is significant and what is not will not be easy.

Another field that came in for the most careful consideration was transmission of the organism of leprosy to laboratory animals. The reports in this case were not exactly a new breakthrough, but seemed to me to represent a long climb over a difficult trail to a new plateau. The reports at this meeting, in a certain sense, represented the coming of age of research that was accepted by a few at first, then by others, and

finally by all of us. It was interesting to see that many who discussed the problem wanted to go to a larger animal, to repeat on a larger scale what has been so successful in small animals. I have made special note of one or two titles that indicate the possible scope of wider use of present opportunities. Dr. Rees presented a paper on bacteriologic, immunologic and pathologic studies on experimental human leprosy in the mouse foot pad. That fairly long title only begins to indicate what use can be made of the method. It has possibilities for determining the viability of organisms for diagnosis also, perhaps for distinguishing types with respect to virulence, for assessment of the chemotherapeutic effect of various compounds experimentally in animals instead of man, for determining the value of immunization procedures, and so on and on. The method has become one of very great importance. And, incidentally, I did not think the idea of using 4,000 elephants in a single laboratory experiment altogether fantastic. If we could be sure, in these days of great expenditure, by running an experiment with a good sized stable of elephants, of a reasonably good chance of answers to our greatest problems, I believe the International Leprosy Association and Mr. Crowther of the Leonard Wood Memorial somehow or other would find the necessary funds.

There are many other high spots that should be noted. I have referred briefly and simply, to a small number of laboratory studies. To me they were extremely impressive. Actually, in all probability, those who have stayed here the longest, and that is to say those who are chiefly engaged in clinical work, have derived the greatest benefit from the succession of clinical and related papers presented during the last 24 hours. We were all impressed by Dr. Baynes-Jones' fine talk last night on international relations in leprosy research. All disease problems, of course, demand international cooperation. But I know of no disease in which international cooperation is needed as much as it is in leprosy. Some of the laboratory papers illustrated the value of international cooperation, e.g., the importance of temperature

effects in the transmittal of research material from regions of endemic leprosy to institutions far away but competent for its study.

I am sure all of you have been as much impressed as I by the beauty of the photography we have seen in pictures shown right up through the last paper given. It is no digression to say here that I was much impressed by a series of papers recently published by Dr. Skinsnes in *Leprosy Review*, in which he discussed the age-old attitude of peoples to leprosy as a repellent disease. I pointed out in an editorial commenting on these papers that there is nothing in the disease that is repulsive to a physician. As a matter of fact advanced leprosy may be in no way repulsive to anyone. My experience with clinical leprosy has been small, but I did once visit a leprosy village, the substantial town of Agua de Dios in Columbia, down the mountains from Bogotá. The day I arrived a beauty contest was in course, and two very personable girls were in the lead. I understood that each of them had fairly advanced leprosy in the diffuse form that does not show up in nodules. These two girls were competing strongly for the title of beauty queen. It can happen.

And, speaking further of photography, several highly important points were brought out in the discussions of electron microscopy. The electron microscope is now indispensable. A steady increase in reports of electron microscope studies is evident in meetings of pathologic societies. To be sure, the impression cannot be escaped that the work is in its infancy. It seems to me that in the field of electron microscopy we are about where histologists were a century ago when microscopic sections and simple stains were just coming in. I suspect that during the next hundred years progress will be much more rapid.

The correlation of leprosy studies with research on other mycobacterial infections was extremely important. As some of you know, we hope before long to have substantial articles in the *INTERNATIONAL JOURNAL OF LEPROSY* on other pathogenic mycobacteria and the diseases they cause.

The discussions on epidemiology were of outstanding importance. It was interesting to note the methods that have proved so valuable. The procedures that were fruitful in tuberculosis are now used routinely in leprosy and with good effect, but I would say with much more difficulty, because of our problems with the organism itself. At any rate, good epidemiologic work, with adequate statistical evaluation, and not just guess work, is vital for necessary public health control in leprosy.

It is clear that the field of genetics should be investigated much more elaborately than has been the case in the past. It was very interesting to note a general feeling, with respect to susceptibility to leprosy that genetic factors may be responsible for differences in the major types of the disease. No one thinks of leprosy any longer, any more than he does of tuberculosis, as a hereditary disease, but, just as in the case of tuberculosis, we have come to think of certain factors in leprosy as elements of susceptibility or resistance.

Finally, I should say that in spite of my fatigue, and I know we are all fatigued, I have listened to the papers this afternoon with intense interest. They dealt with the clinical treatment of leprosy, which after all is our end product. It is what, in the last analysis, Dr. Binford and his committee had in mind in breaking the bottleneck, if possible, of cultivation of the organisms. The intensive laboratory studies under way are not just for the fun of it, but are carried out in the hope that they can feed ultimately into clinical work for the benefit of the patient.

In conclusion I have only to say there have been times when I was a little tired and slipped out to sit in Miss derrom's chair during the few moments when she was on duty elsewhere. While there I took a good look at the ancient skulls that Dr. Møller-Christensen left in that room on exhibit. I could not help thinking of the brains that filled those skulls some 500 years ago, and I wondered about the thoughts that went through those minds. I am sure there was worry, certainly bewilderment at the treatment they received at the time, and I have no doubt not a

little sadness. So I got to thinking about the paleopathology of 1965. We can't be much beyond a mid stage in leprosy research. The present has always had a very bad habit of thinking it was the top. In the next 500 years we shall probably make far more advance than in the last 500. I wondered how the current numbers of the *INTERNATIONAL JOURNAL OF LEPROSY* will look in 2465. For example, how will the fine electron microscope pictures we have seen at this gathering look at that remote time. Very primitive probably. But the fact remains that they are highly important in the present state of our knowledge.

As I have said several times, and will say once more, we wish to get out a black and white record of this conference as soon as possible, so that advantage can be taken immediately of the facts brought out here in the last four days.

Dr. Skinsnes. I wondered how a master would summarize the conference and I know now. Thank you very much, Dr. Long. I am going to interject one item into the program that was not scheduled, because I think it is necessary. And that is thanks to many, the Leonard Wood Memorial, Mr. Crowther, the Armed Forces Institute of Pathology, Dr. Binford and many others. I would like to call on Dr. Cochrane for this. To many of us who work in this field he is Uncle Bob. Will you please represent us?

Remarks by Dr. Cochrane after Dr. Long's Summation

Dr. Cochrane. I feel like the bridegroom suddenly called upon to make a speech who put his hand on his bride's head and said, "this thing was thrust upon me." But I am happy to have this opportunity. The Leonard Wood Memorial is one of the organizations for which I hold the greatest affection. I was present at its beginning. I knew Perry Burgess well, and it was Wade who started me on histopathology. He and I do not always agree, but if it had not been for him I would not have looked

down a microscope at all. It was Chapman Binford, when I came over here, who encouraged me, in my rebellious ways, to go around and dig needles into people, and Mr. Crowther has been a very great friend. I am sure there is no one here who does not appreciate the tremendous contribution the Leonard Wood Memorial has given to leprosy. I am very grateful indeed, as we all are, to the fine people who have worked with the Leonard Wood Memorial. In my opinion the person who put real energy and real results into the proper testing of drugs was Jim Doull. We know he was critical, but he always was constructively critical and I do not think that the understanding of therapeutic trial owes more to anybody than to Jim Doull. He really started us on the right lines in chemotherapy. This conference, Chapman, represents the peak of what a cooperative conference should be. I hope you won't be so exhausted in your headquarters as not to think about another one. I admit that I call one group of people astronauts, but, after all, astronauts are useful. They make us whose feet are on the ground, look up and wonder when we are going to get there. It has been a wonderful conference, quite apart from things I did not understand. The conversations between people and the talks between the meetings, have been valuable. And, therefore, to Chapman Binford, to Dr. Long, to Mr. Crowther, and to many others, I say that sometimes I think I am more at home in America than in my own country. I have been accused of being an American. A person in the Leopoldville airport asked me what part of America I came from. But we are terribly grateful to you. Thank you very much indeed. The words that I am saying now do not half express the total gratitude of this group of people to the Leonard Wood Memorial and to those who have had the task of organizing this conference. Our total gratitude cannot be expressed in words. Thank you very much.

Closing Remarks of the Conference

Dr. Skinsnes. With reinforced thanks may I turn the meeting back to Dr. Binford for closing.

Dr. Binford. The committee that planned this meeting consisted of Dr. Hanks, Dr. Feldman, Dr. Long, Dr. Parlett, and Dr. Shepard. Dr. Rees also aided this committee. It is to this group that credit for the meeting belongs.

I want to thank all who came here from so many parts of the world to make the meeting a success. I hope you feel it has been worthwhile. I think that when the *Proceedings* are published in *THE JOURNAL* we will agree that it has been a very worthwhile effort.

Before I present Gen. Blumberg to close the meeting, I want to thank him for the wonderful support we have had from all of the units of the Armed Forces Institute of Pathology in making this meeting a success. I wish to express our appreciation for the excellent facilities, the audiovisual work of Mr. Dotson and his crew, the fine assistance from Major Berlow in the Pathology Office, the staff of the Medical Illustrations Service for what they have done for us, and the staff of the American Registry of Pathology, whose Director is Captain Bruce H. Smith, MC, USN, for the programs. I failed to mention at the beginning of the meeting that the programs were printed at the Armed Forces Institute of Pathology, by the American Registry of Pathology. Now, General Blumberg, we would like to call on you to close this meeting officially.

General Blumberg. Thank you, Dr. Binford. If I were a preacher I would just hold up my hands, say a benediction, amen, and get you on your way. Dr. Binford, when you came in, they were complimenting you on the many attributes that we here at the Institute are so familiar with. Dr. Binford is a hard man to keep up with. When he comes up to you and says he has a little thing he would like to ask you to do, watch out for two or three months of work. I have seen how this conference grew, and I am delighted that it did. We need more workers like Dr. Binford. I cannot say that the closing part of the conference was thrust upon me. Unlike Dr. Long, I do not have 16 pages of notes to report in closing. I agree, too, that closing remarks should not be too painful. But with so many ex-

perts here, we, at the Institute, have gained as much from these four days as you. We like to learn about a subject with which most of us do not have daily contact. We have had the pleasure of your fellowship, and the opportunity to know you better. The best way to a common understanding is to meet like this, on an international basis, see each other after duty hours, and pick each other's brains and understanding

for the things that don't appear in print or lectures. I assure you, on behalf of the staff, that we have enjoyed having you here. Perhaps four years from now we will see you back; we would certainly enjoy having you. We wish you a safe trip home. We will have as fond memories of this meeting as you. Thank you very much for being with us.