

**DR. JUSTIN M. ANDREWS**

**An Oral History**

**Director, National Institute of Allergy and Infectious Diseases**

**National Institutes of Health Bethesda,**

**Maryland**

**Interview with**

**DR. WYNDHAM D. MILES Historian,**

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Date: July 27, 1964

Interviewer: Dr. Wyndham D. Miles

Q: Dr. Andrews, would you just start off by telling me where you were born, when you were born, and anything you'd like to about your childhood?

**DR. ANDREWS:** I was born in Providence, Rhode Island, August 1902. My father died when I was about four and a half years old, following surgery for removal of kidney stones. Accordingly, my mother and I had to go and live with my grandparents in a little town in Connecticut called Voluntown. It derived its name from the fact that it supplied so many volunteers in the early days of the Revolutionary War. This was a mill town where they spun cotton, wove cotton cloth. It was peopled largely by French Canadians and by Yankees. My mother became the principal of the local eight-grade school. As a matter of fact, she was my teacher the last year that I attended the Voluntown Grammar School myself.

I played cornet in the Voluntown Brass Band when I was 12 years old. I was, I think, the only juvenile that was in this group, and my grandmother took rather exception to the fact that I was associating with these middle-aged younger men, and going around various places with them. She wasn't quite sure just what effect this would have on my general character.

My grandfather was a dirt farmer. He owned a nice home in Voluntown, but he also had a large farm about three miles out of the little town, and there he raised corn and oats and various grasses largely for his farm animals. Almost every day I had to go to this farm with my grandfather. To a young boy, this was not a particularly cheering avocation, and I got, actually, to the point where I detested farms and farming because it was just too much hard work for a young kid. We lived next to the Baptist Church in Voluntown, Connecticut, and I became much concerned there with church activities. As a boy, I was sort of the general flunky, assistant janitor. Finally, my mother obtained a somewhat more lucrative position, still as principal of a grade school, in Rocky Hill, Connecticut. This was a year or less before I graduated from Voluntown. I finally joined her in Rocky Hill, which is a small town midway between Hartford and Middletown, Connecticut, and I went to Middletown High School to get my high school education. My mother and I both boarded in a private home of the local postmaster in Rocky Hill, and I went by trolley car each day with the other high school students down to Middletown, where I graduated in 1919.

During this period, I worked afternoons as an electrician's helper, wiring houses in Rocky Hill and later in Middletown. At that time, there were very few houses which had electricity in them, and most of these were old houses that had to have electricity added. It was not installed when they were built. So that I became something of a capable workman in electrical work.

I was also interested very much in science, particularly in chemistry, which is, I suppose, the only science that I had been exposed to. In the interval, after World War I, before the American soldiers were repatriated, there was a period during which the soldiers and the sailors were being discharged, and a good many positions which had been held by war workers were vacated before they could be filled by these returning

servicemen. It happened that the chemistry teacher position was unoccupied in the Middletown High School, and the school superintendent, a man named Mr. Dunlap, I remember, knowing of my general interest in science, asked me if I would teach the science class of freshmen, which I did for 30 days, and was ultimately rewarded with one dollar a day for my services. This was the first time I earned any money by teaching.

Then I was replaced by a young Army lieutenant who had just been discharged from the service, and I graduated from the high school in due course in 1919.

Q: What kind of science courses did you have in high school? Did you have chemistry?

**DR. ANDREWS:** We had chemistry, we had physics. I think this is probably all.

Q: Were they laboratory courses?

**DR. ANDREWS:** Yes. The chemistry, particularly, was a laboratory course. In fact, I made it very largely a laboratory course, sort of smudged out the whole high school once or twice in some of my experiments.

Q: Did you have a regular laboratory, laboratory benches, running water, gas, and so on?

**DR. ANDREWS:** Yes. This was a well-equipped laboratory. Both the physics laboratory and the chemistry laboratory, I would say, were well equipped for their time. There were courses taught to freshmen in general science, and then the last two years, as I recall it, students could elect to take physics or chemistry or perhaps both if they had the time and inclination to do it. It was really an up and coming high school, I think, as I look back and I view it in perspective in comparison with a number of other high schools that I've had some contact with since then.

As a matter of fact, I think that this general interest in science is what impelled me to want to go to college, which, as far as I know, had never been essayed by anybody else in my family. So I told my mother that I would like to go to college, and she didn't quite know how she was going to manage this, but if I wanted to go to college, this was good enough for her, and she was ready to help me any way that she could.

I remember very clearly how, one day, she took me and we walked up College Hill in Providence, Rhode Island, which is where we used to live, to the only university that she knew anything about, which was Brown University. She discovered where the president's office was, and she grabbed me by the hand. She had a roll of my mechanical drawings under her arm and my high school record with her, and we found Dr. William Howard Perry Faunce, who was the president of Brown University. We went directly into the man's office, and my mother announced her name and said that she was here with her son, he wanted to go to college, and how did you go about it. It was nothing more formal than that. We had a talk. Dr. Faunce, who was a splendid old gentleman, was very, very kindly, and before I knew it, I was enrolled in Brown University right away. I contrast that now with the experience that my wife and I had recently in sending another boy to Brown University, and the interest that the university officers have in the income and in background and all of these things that stand in pretty sharp contrast to the experience that I had when I went to Brown.

Q: Did you have any plans for what you were going to study, what you were going to major in?

**DR. ANDREWS:** Yes. I went to Brown with the assumption that I was going to be an engineer. This was based, I think, upon some dexterity with tools. I had confused using tools with being an engineer, but it took me only three or four days as an engineer to find out that I'd made a horrible mistake. So I managed to get myself excused from the engineering course, and I took a general course at Brown, which I think was much the wiser thing to do.

I should say, perhaps, the first night I was at Brown, the old custom of hazing in those days was faithfully carried out, and a bunch of sophomores and upper classmen riveted [sp?] a lot of freshmen out of their rooms and drove them off in a truck into someplace in Massachusetts, and dumped us all out near a cow barn. Then they proceeded to tie us up to the cow stanchions, and they drove the car away. Well, ultimately, of course, somebody managed to wriggle loose, and he liberated the rest of the freshmen. He had a knife, and he committed a little surgery before he got through. I have scars still on my wrists where he chopped into them. They were tied behind me on this cow stanchion. But we all got back in due course.

As we walked into Providence, it happened that we went past the office of a physician who had been my obstetrician, and so I knocked at the door, and he was good enough to take care of my bloodied hands and got me fixed up, and I went on my way to college.

Q: You said you took a general course, but what kind of science course did you have?

**DR. ANDREWS:** This involved, largely, biology for me. People who took science courses could major in physics or in chemistry or in biology. While I had a strong interest in chemistry, I found myself, as a general student, obliged to take biology my freshman year. This was a fortunate occurrence, because I knew nothing about biology, but it opened my eyes to a new field of scientific interest which, as I say, I had never explored before.

We had a professor, Professor Gorham, who was a marvelous lecturer, and he lectured to it must have been 200 or 300 students at a time, so there was nothing personalized in his presentation at all, but he was such a marvelous lecturer that I think he moved most of us into some consideration, at least, of wanting to be biologists or medical people or something which was akin to biology. Of course, in the laboratory part of the course, we did have opportunities, as usual, to see botany and biological specimens and to know something about the basic principles of biology.

The second year that I was at Brown, I took comparative anatomy, which was the natural thing to do. This was a course that was given by perhaps the best teacher that I ever had, a man by the name of Walters. This gradually drew me more and more into the area of the pre-medical students, and ultimately I took all of the courses that were offered in biology at Brown and helped in teaching some of the undergraduates before I left there.

Q: You said you got into the area of pre-medical. Did they have a regular pre-medical curriculum at Brown then?

**DR. ANDREWS:** Yes. Yes, they did. This consisted of courses extending from basic biology into such things as comparative anatomy, embryology, things of that sort. So it was a good preparation. Brown has always had an open market for its graduates going to medical school. They've always been very welcome almost anywhere. So that this is really how I got close to it, but I didn't quite get into medicine. This was largely, I think, because of money. This is what I would have liked to have done, but my mother had done so much to get me so far, that it was almost out of the question to expect that she could help me a great deal more. So I had to do something where I could get a little compensation for it myself.

**Q:** You mentioned having such excellent teachers in biology, that they attracted you to it. Apparently you didn't have good teachers like that in chemistry, because you said that you liked chemistry when you started off.

**DR. ANDREWS:** This is true. This is true. I think that the chemistry was purely fortuitous, because they needed somebody to teach some freshmen in high school. Dr. Dunlap knew that I had some interest in it, and that's really how I got involved in that. I was glad to have had the experience, what little it was, and it was helpful when later I had to have biochemistry and the other things which related to biology.

**Q:** But at Brown, apparently, they didn't have the sort of chemistry teachers that kept attracting you to it, is that it?

**DR. ANDREWS:** I guess this is correct. This doesn't mean that the chemistry teachers at Brown were not as capable or as plausible as the biology ones, but I happened, as a result of this freshman course in biology, to become attracted to the people who were teaching biology. I did have to take chemistry, of course, advanced courses in it, but chemistry never had the same pull to me that biology did. This was accentuated even more by the fact that it was either the second or third summer—I don't recall which—I went with the professor of comparative anatomy, Dr. Herbert Eugene Walters, to Cold Spring Harbor on Long Island, where there was a laboratory which was attended by a number of different sorts of people. There was a biology laboratory there. This was also the place where the Carnegie Institute had one of its large installations, and at that time, such people as C.C. Little were carrying on researches at Cold Spring Harbor.

I went there as a student once the first summer, and then I went back, taking increasing interest in the work and teaching for five years, five summers at Cold Spring Harbor. I taught nature study classes, about which I knew very little, and we gave a course in animal surgery, about which I knew very little, but we all had a real good time. This was a wonderful place. We met many people who have since become very prominent. Dr. Peter Churchill, who is now the Professor of Surgery at Harvard, was there as a student years and years ago, and C.C. Little and part of his establishment was starting out there at Carnegie Institute. You see, this was a combination of the biological laboratory that had been developed by Dr. C.C. Davenport, who was a well-known geneticist, and he was the man who had established this biological laboratory at Cold Spring. Dr. Reginald Harris was there at that time, and he ultimately married the daughter of Dr. Davenport. I met many people who were students or were doing graduate studies at Cold Spring Harbor who later became fairly prominent individuals.

After I left high school, I went to John Hopkins University School of Hygiene and Public Health.

Q: Why did you pick out John Hopkins?

**DR. ANDREWS:** To tell the truth, because I was offered a job there. These fortuitous things have a great deal to do with making or changing people's careers, I'm sure. But I was offered a job by Dr. Robert William Hegner, who had just taken on a new position at John Hopkins at the School of Hygiene and Public Health, to present such courses as parasitology and protozoology and a variety of biological quasi-medical concerns that were financed very largely by the Rockefeller Foundation in those days. They sent students from all over the world to John Hopkins and to Harvard, where they were given training which led ultimately to the development of good health officers. But basically, they had to have medicine and they had to have a variety of courses in child hygiene, in development, and in parasitology and in a variety of things which were designed to give them greater capability as health officers. During this period, I became acquainted, through teaching many of these people, with folks who are now very prominent in various parts of the world because of these contacts. All told, I was at Hopkins from 1926 to '28 as an instructor and associate and associate professor.

Q: Could we go back to this job that you had? What were you, a graduate assistant or an instructor?

**DR. ANDREWS:** This is exactly what I was. I was, the first year, a graduate assistant. I've forgotten how much money I got. It was a trifling thing. And then I became an instructor.

Q: What did you do as a graduate assistant, help the fellows in the laboratory?

**DR. ANDREWS:** Yes, prepared the materials for classroom work, and ultimately I tried giving a few lectures, and became progressively an associate and associate professor at Hopkins, so that I was there until 1938.

Q: What courses did you teach when you were assistant professor?

**DR. ANDREWS:** I taught courses in protozoology, primarily, and in parasitology and in malariology. Those were the three things that I taught. The malariology ultimately became my sort of specialization with me, and I became very much interested in malaria control, as you will see from the later parts of this discussion.

Q: Where was this, up in Baltimore?

**DR. ANDREWS:** Yes. The School of Hygiene and Public Health was held in a structure which no longer exists, on Wolf Street in Baltimore, downtown, and was famous because this is where "Popsy" Welch started his teaching in the medical school many years ago.

Q: Was Welch there when you were there?

**DR. ANDREWS:** Yes, yes.

Q: Still around?

**DR. ANDREWS:** Oh, yes.

Q: Was he still teaching?

**DR. ANDREWS:** Yes, everybody knew "Popsy." "Popsy" was the first dean, and then I don't recall—this man was a physiologist, but he was dean for a number of years afterwards.

Q: Did you have any contacts with Welch?

**DR. ANDREWS:** Oh, yes.

Q: I'd be interested in getting your impressions of him.

**DR. ANDREWS:** "Popsy" Welch was a very rotund, portly individual, but he carried himself erectly, was a marvelous conversationalist, never at a loss for a phrase or a word, and I began to discover in my contacts with him that one of the reasons was that he saw to it that he familiarized himself with the background of the people that he knew he was going to meet, because I had to do a lot of them looking up for information about these people before he introduced them, for example, to deliver a lecture or something of that sort, he saw to it that he was well instructed himself about these things. This, of course, is a very prudent thing to do. While I was at Hopkins, I was made a special member of the Rockefeller Foundation so that I could participate in a job that they wanted done in the West Indies. This was a malaria survey which was made in the island of Grenada, which is in British West Indies. Dr. Root, who was the professor of entomology at Hopkins, and I, I went as a protozoologist, he went as an entomologist, and we had two or three graduate students with us. We spent the summer in Grenada making a malaria survey around this island. Malaria existed only at the periphery of this island. This was known as the fruit island, I believe it was, tremendous quantities of oranges, grapefruit, and various others, plantains bananas of all kinds. I never knew in my life that there were so many different kinds of bananas as existed there. We had a wonderful experience. This was my first opportunity at doing anything like malaria control, a malaria survey in the field. I had, I must say, lectured about things that I didn't know a great deal about. This gave me a little more substance and knowledge about the things that I had been talking about so glibly before.

In the course of all this, I became married and the daddy of a couple of boys. Then I was offered another opportunity as a visiting professor of parasitology at the University of the Philippines. This was in 1930 and '31. Mrs. Andrews and I went to Manila. This, of course, was a very, very rare experience for both of us, and I spent the year in Manila and thereabouts, doing the same sort of teaching at the University of the Philippines that I had done at John Hopkins.

Q: Teaching the same courses?

**DR. ANDREWS:** Yes. I taught parasitology, malariology, protozoology; those were the three things that I ordinarily took care of. And another little boy came along, and then I was offered an opportunity to go to Venezuela as a consultant in malaria. This, I think, came about because of one of the students which we'd had at Hopkins, Dr. Arnoldo Jbaldon, who was in the Venezuela National Health Department. He

was keenly aware of the fact that malaria was one of the important diseases in Venezuela, and he was good enough to ask me to come down and do surveys and advise the National Health Service about malaria control.

Q: Incidentally, had you left John Hopkins? You mentioned going to the Philippines and on down to Venezuela.

**DR. ANDREWS:** No, I was on leave. Then I had another opportunity to go to Mexico as a consultant on amebiasis. There was a commercial firm, I don't recall just what they were doing, but there was a considerable group of people who were working in Mexico, and, as usual, they came down with amebic disease, amebiasis, amebic dysentery.

They wanted someone to help advise about preventing this disease which can be very serious and is always a difficult thing to deal with. So I was invited to go down to Mexico, and I took Adena with me, a German expatriate who had been working as an animal man at Hopkins. He and I went down to Mexico, and we had a perfectly marvelous time, examined all of these people, finding out who had amebiasis, who did not, and established the fact, which became evident pretty early, that the food handling in the homes of these people who were working in Mexico was the reason that amebic disease was being transmitted from the Mexicans to these workers who had been brought in. Most of them were at very high technical levels, and they brought the families with them. They had a tremendous lot of amebiasis. We were able to diagnose it, and we got the local doctors able to treat it, and this, I think, was a considerable help to this concern.

Then after I got back from Mexico and from Venezuela, I was offered an opportunity by one of my ex-students to go to south Georgia and to work with malaria and hookworm disease. This was in 1938 to 1942. This man who invited me had been a student at one of my courses at John Hopkins, and he was the state epidemiologist, the first state epidemiologist that Georgia had ever had, and he was determined to correct some of the health difficulties which existed in particularly the southern part of that state, and the same thing was true in the adjoining states, as well.

So Mrs. Andrews and I migrated to Atlanta, Georgia, and I spent several years working with the State Health Department in Georgia, on these two diseases. At that time, the situation was really pitiful in the southern part of the Atlantic states, south of the fall line. The fall line is the line which was the border of the old continental oceanic shelf. It's all low land, and hookworm disease and malaria were rampant there. This was complicated by the fact that these were very poor people. Their nutrition was in bad state. I used to look in the children's dinner pails and sometimes in some of the workmen's dinner pails, and you'd see a slab of what they called "fat back," which was white fatty pork meat, with slabs of fried grits on top and on the bottom. This is what the children took to school for their lunches, never an apple or any fruit or vegetable to speak of, and the poor little things were sick. Many of the schools in south Georgia had what were called chilling beds. These were just plain beds that children could retire to while they were having a parasitism of chills and fever from malaria. Almost every day there would be two or three youngsters, sometimes at the same time, that would be lying on these beds, waiting for their fevers to subside so they could go back to school. I think that we succeeded in making a big reduction in these two diseases. This was due largely to the fact that Georgia was then in the state of evolving into having a much better State Health Department than it had before. It also was encouraging and stimulating the development of

county health departments, and this brought more medical people and paramedical specialists into the state, and helped to reduce the hookworm disease which children acquired, of course, by walking in contaminated areas. Privies were built on large scale. Many places in Georgia didn't have anything of the sort. And we did malaria control work where we could find the engineers who were capable to undertake this sort of activity. I had engineers working with me all the time, and medical men, too, so that we were able to present to the county and to the southern part of the state the way in which they could reduce this pair of diseases which, together with malnutrition, counted for much of the bad reputation of the southern states. They were sick; they weren't just ignorant. Then World War II came along. I was invited to join the Army, and I went in as a major in the Sanitary Corps. I was in the Army for four years, and I had service in Liberia the first year, a very interesting experience, the first time that I had been in Africa. We took with us a number of soldiers and non-commissioned officers. It had been my first experience with people of this sort, and it was very, very interesting, particularly after we got to Liberia. We had colored troops there and, of course, Liberia is a colored country, and we had many, many problems which arose out of this fact. Venereal disease was just about as common as malaria, and both of these were phenomenally high.

My job was to see what could be done to reduce the malaria. Finally, I found myself working in V.D., as well. I think we made a very significant impact on these two diseases while we were there. I'm sure that as soon as we left, things probably returned to their original condition, but still, this was one of the tremendously interesting periods in my life.

Q: Incidentally, why were you sent to Liberia? Were they figuring on some military operations there, perhaps?

**DR. ANDREWS:** Yes. The assumption was that if World War II involved North Africa and Europe, and possibly even parts of Asia—this was a forecast, a possibility—they wanted to have people who could prevent, as far as possible, incapacitating diseases amongst the military, because a sick soldier is a real liability.

They started flying planes into this area, and the first stop was in Liberia, so it was necessary to establish sort of a post in Liberia, and this was done. There were myself, a medical officer, and three or four NCOs who went to Liberia, sort of as an advanced detachment, to see to it that the facilities for the soldiers when they arrived would be in good public health conditions, because military health is just one area of public health.

As I've already said, the two main diseases there were malaria, which the men promptly acquired, and V.D., which they got even quicker. We really had a time. You don't want to record some of these things. But I had a very pleasant year in Liberia.

Then our detachment, the Fighting 277th, I believe it was, moved from Liberia to North Africa, and we sort of policed the whole of North Africa from Rabat.

Q: When you say you policed it, just what did you do?

**DR. ANDREWS:** We advised the military installations which were dotted along the North African coast, all the way from Rabat on the west. Most of these installations were in Algeria, and the general

headquarters was in Algiers. This is where I spent about three years of the war. But my activities took me to practically all of the installations. Again, this was the practice of public health, this time under military conditions, and I think we were able to prevent a great deal of disease and make life much more bearable for the GIs.

Q: Did you have malaria and so on up in North Africa?

**DR. ANDREWS:** Oh, yes, tremendous amounts of malaria in North Africa. The whole Mediterranean littoral is ringed with malaria or was at that time. This is no longer true.

Q: I didn't realize that. I knew it was on the European shore. I wasn't so certain.

**DR. ANDREWS:** Oh, yes. Algiers and Morocco and Tunisia, these were the three countries in which we had troops, and they had to be cared for. The great difficulty, of course, was in persuading the commanding officers of the necessity of doing these things, of having sanitary camps, sanitary facilities, and sanitary activities going on. It wasn't until these commanding officers saw the results of their rather ignorant assumptions that we were able to get these things going. Ultimately we did.

Q: Did you get over into Italy at all?

**DR. ANDREWS:** Oh, yes. Yes, after a year in North Africa, we invaded Italy. I was in Naples for a year and had a very pleasant time there. Naples is a lovely city. The war was still going on. We were usually bombed almost every night, sometimes there would be a let-up in it, but the Germans were pretty active. Of course, our own troops were, as well. So after a year in Liberia, a year in North Africa, and a year in Italy, I came home.

**DR. ANDREWS:** [Tape slurred] studies in malaria and malaria control have been carried on, particularly by the Rockefeller Foundation people, and we carried on where they left off under the rather special conditions of a military situation rather than a civilian one.

So I came home and hadn't been there very long when I was ordered out to the Philippines, because there was some expectation that World War II would extend itself into that part of the world. Actually, it did in a very small way, but nothing of any great consequence. I was in the Philippines and many of the Pacific oceanic islands for a year, and then I came home and was mustered out. So I had a real good experience during this World War II, and I wouldn't trade it for anything in the world. For a person like myself, who had been a schoolteacher, a professor, to go out and rub noses with some of the real facts of life was very, very enlightening, and I wouldn't trade it for anything in the world. I haven't said anything about my leaving Hopkins.

Q: I was wondering when you had, because you talked about going to Georgia and being down in Mexico and so on.

**DR. ANDREWS:** I think I intimated earlier that I spent some three years at Hopkins, working with Dr. Hegner and Dr. Court, who was the helminthologist there, and Dr. Francis Metcalf Root, who was the entomologist there, all of them marvelous teachers, outstanding in their own research, and this was a really rare experience. I wrote my doctoral thesis on the subject of coccidiosis in mammals.

Coccidiosis is a disease that rarely attacks man, though there have been a few cases of it, but very, very common in cats and in dogs and in rabbits, particularly. This is a protozoan disease which impacts the intestinal and sometimes the livers of various types of animals, and occasionally occurs, as I say, in man.

I graduated from Hopkins in 1926, with a degree, doctor of science in hygiene, and I was immediately made an instructor, and then somewhat later an associate, and in 1938 became associate professor in protozoology. As I've said before, I taught classes each year in protozoology, parasitology, and malariology.

After I had come back from World War II, I returned to the Public Health Service and was assigned to what was then known as the Malaria Control in War Areas organization.

Q: You still haven't told me when you left John Hopkins formally. Was it before the war?

**DR. ANDREWS:** Yes.

Q: When you say you returned to the Public Health Service, had you been in the Public Health Service?

**DR. ANDREWS:** Yes. Just before the war, the Public Health Service evolved the idea of enlisting all of the state health personnel in various different states. They were all made commissioned officers in the Public Health Service for the duration of the war, and that was how I really got blanketed into the Public Health Service in the first place.

Then after I returned from the Army, I was given an honorary LL.D. by my own alma mater, John Hopkins, which touched me greatly, of course. Then I was made an Assistant Surgeon General of the Public Health Service in 1953, and was Associate Chief for Programs in the Bureau of State Services downtown. Dr. Joe Mountin was my colleague there, so to speak, and he is the man, of course, who is very, very prominent in public health activities those years. I was one of the "Joe Mountin boys," and worked with him in various activities particularly concerning malaria, because I was still a malariologist primarily.

I stayed with the Public Health Service from '53 to '57, of course, never really left the Public Health Service because then I came in from the Bureau of State Services, I was invited by Dr. Shannon to come to the National Institutes of Health and be the Director of the Institute of Allergy and Infectious Diseases. This is what I have done ever since. This was in 1957.

Q: Did you come when Victor Haas left?

**DR. ANDREWS:** Yes. Vic left and I was his replacement. He went out to the West Coast. Since that time, we've had, for me, at least, a marvelous experience in something in which I didn't know a great deal about, to tell the truth, because I had had no occasion to be knowledgeable in such things as allergy, though I, of course, had had some experience with infectious diseases. But I think that this rose out of the fact that I had been conspicuous in the development of the Communicable Disease Center. I think that Dr. Shannon wanted somebody of that sort to help build up the Institute for Infectious Diseases.

Q: How about talking about the development of this CDC?

**DR. ANDREWS:** The Communicable Disease Center grew out of the Malaria Control in War Areas activity, which had been started by Dr. Mountin. As the war waned and the necessity for malaria control became less and less pressing, Dr. Mountin turned his attention to a number of other diseases and conditions which prevailed in what was then called the deep South. We continued, really, the activities that had been started really prior to the war and carried them on much further than we had been able to at that time. As a result of my activities with malaria control, I think, he asked me if I would come in to the Bureau of State Services, of which he was in charge. I continued work in Washington and out of Washington. In Washington, I had a good bit of contact with the Surgeon General's office, attended all the Surgeon General's office meetings, things of that sort, and really got my indoctrination into the more advanced types of public health activities from the standpoint of administration rather than participation in the actual activities. I was with the Bureau of State Services for four years, and then, as I've already said, I was picked up by Dr. Shannon and brought in to fill the space that had been vacated by Dr. Haas.

This was really the turning point of my career from being a technical, technological individual, to an administrator. I don't know if this is good or bad, but this is the truth of the matter. Every since then, I have been concerned more with the activities of other people than I have with my own. I've enjoyed this in a way. The business, for example, of getting the funds with which large projects can be undertaken, the business of testifying before Senate and House Appropriations Subcommittees, this is all very interesting in seeing how and where we get the money to do the things which we have to do in the Public Health Service, and particularly at NIH, because my interest at that time was restricted pretty much to NIH, though interestingly enough, the Communicable Disease Center, which had been the Malaria Control in War Areas during the war, wanted to maintain itself as the same sort of an organization as it had been. There was every reason for doing it, and its name was changed from the Malaria Control in War Areas, MCWA, it was called during the war, to CDC, Communicable Disease Center. This name was given by Dr. Thomas Parran, who was the Surgeon General when I came into Washington to work in the Public Health Service.

So since that time, I have been concerned with, number one, getting the funds to operate this institute with; number two, developing, with the assistance of my associates here, suitable programs for this Institute of Infectious Diseases and Allergy. I must say that I had had no instruction whatever in allergy when I came here; this was a new field of interest to me. But I became greatly concerned with it, and realized that much less is known about allergic disease than there is about infectious disease. So I have tried to stimulate interest in the allergic diseases in this institute and in other places, because through our extramural activities, our grants program, it is possible to invite participation in areas of research which have been neglected largely for the lack of funds, and with the support which this institute and all the other institutes can provide, if possible, to fill in some of these areas that have never been cultivated to any great extent.

I think that while much remains to be done, that we have accomplished a good little bit from the standards of both infectious disease and allergic disease. Right at the moment, our principal interest is in homo-transplantation of organs from one individual to another. We're interested in it not

because of the meticulous surgery which is involved in it, but because no two bodies, unless they are identical twins, have the same genetic background. When you try and take them and place tissues or organs from one individual into another, the natural reaction of the recipient body is to reject this foreign tissue. It's become obvious that it would be very advantageous if we could make use of these spare parts from other people, even from cadavers. If a person has, for example, a kidney disease which is going to be fatal, if you could give him a new kidney from a cadaver or from somebody else who could spare a kidney, why, this would be very advantageous. But again, the problem of tissue rejection, of the immune response, this is what it is, and this is why we're interested in it. We are interested in the immunity angle of transplantation. Immunity, of course, is almost the opposite word from allergy.

We have, I think, by our support, which has been tremendously expensive, of various individuals who are concerned in homo-transplantation in different parts of this country, I believe that we are, number one, advancing this particular field of research. Number two, we have learning things about immunity and this immune response due to the rejection of foreign tissues, which probably would be impossible to arrive at any other way.

Incidentally, we have found, as have others, that it is possible to reduce this immune response by the use of certain drugs which were originally intended, I suppose, for treatment of cancer, but they are tissue destructive drugs. By the judicious use of these drugs, it is possible to reduce the immune response and so get an organ fairly well started to grow as a transplantation in a new body. This has been tremendously interesting to watch, but this has called for even greater expenditures and money, because when you stop and think of all the surgical fees and the hospitalization and things of that sort which goes on for months and months in many of these individuals, it's tremendously costly to indulge in this type of research. But I think that it's tremendously important that we learn from this opportunity some of the basic aspects of immunogenesis, which we have thought about, but we haven't had the opportunity to explore the same way before.

Accordingly, this institute has been concerned, along with the Cancer Institute, because some of the drugs which were developed with the hope of there being anti-cancer drugs, have turned out to be pretty good drugs for destroying this immune response, by destroying the tissue from which the immunity evolves. This has made possible organ transplantation on a scale which I think was really never conceived of, and this is only within the last three or four years. In fact, most of it within the last two years. I think the time may come when it will be possible to bank certain of these tissues and maintain them for considerable periods of time so that it won't be a question of rushing the kidney from the third floor to the sixth floor or the operating room, something of that sort, in order to do what is necessary.

This is pushing along surgical techniques, it's giving us some much greater insight into the mechanism of immunity, and this has also, interestingly enough, helped in the control of certain other diseases which have been considered as being more or less unmanageable. I'm thinking now of what are known as the auto-immune diseases, such as nephrosis. These are diseases which apparently are caused by the body becoming sensitized to some of its own tissues. The body reacts to certain kidney tissue or-to tissues from other parts of the body as if this were an introduced foreign object, and this produces these auto-immune diseases which are being studied in our own clinical laboratory here in the clinical center. And the same drugs which can be used to suppress the immune response in

transplantation surgery are found to be of usefulness in these auto-immune diseases. So that by keeping up a broad spectrum of interest, you see, we frequently pick up something from one place which is of value not only in its own setting, but possibly in one which is considerably removed from it.

Dr. Vernon Knight had succeeded in reducing the more urgent symptoms, for example, of lupus. Lupus erythematosus, which is one of the auto-immune diseases, and nephrosis, which is another one, by using the same drugs which originated as anti-cancer drugs, then were used by us for transplantation purposes to depress the immune response are now being used for the auto-immune diseases to reduce the sensitivity which people develop against some of their own tissues. It all sounds very involved, and it is, and it's a long way from the rather simple things which we did even the first years that I was here, when this was very largely an infectious disease outfit, nothing else. So that with the development of new knowledge both here and from outside, we have been able, it seems to me, to place our interests in a somewhat more sophisticated level than they used to be when we were interested in boils and streptococcal diseases and staph, one thing and another like that. I don't know what the future is going to be, but I think that the start which is now propelling some of our activities along this line of depressing immune responses are going to be found to be very useful in a number of ways in these auto-immune diseases. I'm as sure as anything that people are going to be walking around with somebody else's livers and kidneys and even possibly hearts. There's been some experimentation done on transplantation of hearts, and this is really the high point in transplantation surgery.

But there has been so much reconstruction of the heart done to remedy valvula and other defects, that [Michael Ellis] De Bakey and the other heart surgeons have devised ways and means of doing open-heart surgery which are perfectly fabulous, and I can see no reason why, in spite of the fact that nothing seems more impossible than first losing a heart and having another heart put in its place, it wouldn't surprise me a bit if this were done in the not too distant future.

This is a long way from the rather plebian things which we did in Cold Spring Harbor and in the early days at Hopkins and since we've been here at NIH, but it's been a stimulating experience almost all along the way. The capabilities that have evolved as money has become available, this is an important consideration, and people like Dr. Shannon and his associates and the Institute directors, all of whom have to request their own funds from the appropriations groups, are deeply involved and concerned in these things. I can foresee a coalition of interests between CDC and this Institute, in remedying certain situations which thus far have been difficult or impossible to touch, some things like infectious hepatitis. CDC, for example, through its contact with states, has capabilities of reaching out, getting information from the whole country, which is quite a different type of activity than what we have here at NIH, where we're concerned almost entirely with research, not with correcting or improving practices of state and local health offices, which is CDC's primary responsibility.

I believe that as CDC gets further and further along in research, which it clearly is doing, that the combination of these facilities, of the high research potential and funds which exist here at NIH, and the contacts that CDC has in the states, in different parts of the country and now extending out relatively throughout the world, that we can look forward to a tremendous expansion of programs. These will be bounded, as far as I can see, primarily by such things as space and people. There's

a limit where you can go in space in NIH, and there is a limit to where you can go with people. When we go before the Congress in order to get funds, we also request a number of positions that we think are going to be necessary to do this work. This is of critical interest to the congressmen, because they have to account to each other and to their voting people behind them for the number of people that are being employed by government, it's up to the Congress to see that all of these people are properly and usefully employed.

I think that the activities of the two groups that I have been most concerned with, the Communicable Disease Center on the one hand, and the National Institutes for Allergy and Infectious Diseases on the other, have evolved along with all the rest of the activities in public health research here and at other establishments where these things are carried out. So that things are now being done which were utterly unheard of when I emerged from John Hopkins, for example. Nobody knows what the ends of these things could be, but I am sure that this is in the interest of the general public to have and to maintain facilities, in research, and in the application of new research findings. NIH can do the research. Groups like CDC and the State Health Department can make the applications of these things. This means a better life for the American public, as I see it, and for that matter, the whole world.

Of course, NIH isn't the only research institution that's carrying on such activities. There were comparable ones in England, in France, Germany, probably many other places. In Italy, I know there are. The sum total of this impact of so many different minds in so many parts of the world can only mean, it seems to me, a better life for everybody.

Have I chatted enough to suit you?

Q: My philosophy is to get anything a person wants to talk about.

**DR. ANDREWS:** Well, I guess I've about exhausted myself then.

Q: This is fine.

*End of interview*