

**Interview of Dr. Claude Lenfant,
Atlanta, Georgia, 7 November 1999
The interviewer is Dr. W. Bruce Fye**

FYE: I am going to call you Claude throughout these interviews. We will do away with formalities. You were born in Paris?

LENFANT: Yes.

FYE: On October 12, 1928?

LENFANT: Yes.

FYE: Could you tell me something about your father?

LENFANT: My father was an executive, a pretty high up executive actually, at the Shell Company in France. I do not really remember, [in fact] I do not even know if I ever knew, but I think that his whole professional life was at the Shell Oil Company.

FYE: What did he do at Shell?

LENFANT: I believe that he was the president of something or other. I think he went up through the system. I do not know where or how he started. This is pushing me a bit here, but I do remember that we traveled a lot in France when I was growing up. I know we were in Lyons when the war occurred. He was in the French Air Force during the war and after the war we ended up in Toulouse. We went from Toulouse to Nantes and from Nantes to Paris, where basically he stayed until he retired.

FYE: So as a young person, as a boy and adolescent, and as a young man, you were moving fairly constantly.

LENFANT: Yes. I do not remember before Lyons. In fact, it is very interesting but I have no recollection of where I was before Lyons, but that was 1938. So from 1938, yes, indeed, we moved about. But my parents divorced. Now when did that happen? I think it was during the war or before the war. I stayed with my mother during

the war, and after the war I returned to be with my father, who, by then, was remarried. During the war, we were with my mother in Normandy and when the German army came into France, we moved from Normandy to Pau. Do you know where Pau is?

FYE: No.

LENFANT: It is in the south, not far from the Spanish border, maybe 150 or 200 kilometers, and not very far from Toulouse actually. So when the decision was made that we would go back with my father, we moved from Pau, where we were, to Toulouse, which was, maybe, 200 or 300 kilometers away, something like that.

FYE: Do you have brothers and sisters?

LENFANT: I have one brother from my father's first marriage, and I have one brother and one sister from his second one.

FYE: So they would be your half brother and half sister. And your father's name was Robert?

LENFANT: Yes. How do you know that? I am impressed.

FYE: Historians have their ways. Although once again, I am creating a record that I think will be more detailed than anything else for future historians. And your mother's name was Jeanine Leclecq.

LENFANT: That is right.

FYE: Tell me something about your mother.

LENFANT: There is not much to say. She came from a fairly distinguished family actually. I remember that she had a sister who also was, let me see . . . Gosh, I have not thought about these things for many years. Her sister's husband was, I think, a very famous pilot. You know, these were the years when frontiers were really established in air travel and air explorations. My mother, I think, was a housewife all the time, and her family was direct descendants of Ferdinand de Lesseps. You probably have never heard of him, but Ferdinand de Lesseps is the French engineer who designed the Suez Canal.

FYE: How do you spell his name?

LENFANT: D-E L-E-S-S-E-P-S.

FYE: Did your mother spend time in Egypt?

LENFANT: Not that I know of.

FYE: That is a fascinating connection though.

LENFANT: That came from her mother who actually was a de Lesseps. My father, in contrast, was from a military family. My grandfather was a high-ranking officer in the French army.

FYE: This is fascinating. Have you ever documented any of this? Do you know if there is any written document of your life history, or of that of your parents?

LENFANT: Of my life history? No.

FYE: Or of your parents' families.

LENFANT: No, not that I know of. But I do know my father came from a military family for several generations.

FYE: Did that have any implications for you as a young person growing up?

LENFANT: Absolutely not. My father was a pretty strict character. He established rules and that was it. But that was another time. I mean, in those days in France and in Europe, as probably it was here in this country, the family structure was quite different from what it is now.

FYE: So when you were young you did not feel that your family was more strict with you than your friends' families were, it was more or less a cultural thing?

LENFANT: No. It was pretty much the same in all families.

FYE: Right. Tell me something about your siblings.

LENFANT: My full brother, who is older by a couple of years, worked for the Shell Company too. He started there, and he moved into one of the subsidiaries, if you want, of the Shell Company, and he stayed there for a number of years. I have to tell you that ever since I came to this country my rapport with my brother and my family has been fairly, how would I put it, loose and distant.

FYE: Is it partly because of the strain of you leaving?

LENFANT: No. When I was young I was much more kind of avant garde and revolutionary

than my parents could accept. So I had a fairly strained relationship with them and then one day I pretty much walked out on my family. That was in 1947, or something like that. It is a long time ago, you know.

FYE: That is remarkable because, as we go forward into your career, we obviously will get into the point that somewhere someone served as a mentor, I assume, or someone helped you frame your . . .

LENFANT: No, I was always interested in medicine. That is really something that fascinated me. Like many boys in those days as I was growing up I was thinking that perhaps I would become a fireman. You know the fascination of the fire truck or be a policeman because of the motorcycles, or whatever. I spent lots of time in boarding schools. In fact, I spent my whole education in boarding schools, and when I was growing up and going to school I was very interested by biology. I do not really remember a mentor to get into medicine. I made the decision to go to medical school. By then I was gone from my parents. I was living on my own, which was difficult in those days. It was no piece of cake, because the system as we see it and know it today did not exist. There was nowhere to get a grant or a loan or to get all that, so I had to work. I did all kinds of work. I worked during the night in a printing shop. When I had vacations I was working in factories and installing ventilation systems and things of that sort.

FYE: Well, that fits with your pulmonary physiology!

LENFANT: I do not know about that, but, anyway, it was not always easy.

FYE: No, I am sure it was hard.

LENFANT: Be that as it may... When I made the decision to go to medical school I decided to go to a hospital near where I was living to see if I could find something to do to make some money. One of the surgeons there kind of befriended me and then we developed a pretty good relationship. But, in fact, he did ask me often to help him in some of the things that he was doing.

FYE: What was his name?

LENFANT: His name, I think, was Cordebar. Do you know Suburban Hospital [in Bethesda,

Maryland]? It was that kind of hospital, a community hospital, and he encouraged and helped me, and so I went to school, and that is it.

FYE: About how old were you when you were working in that hospital with this surgeon and at what point in your education were you?

LENFANT: Let me see now. You know that in the French system when you finish high school, it would be equivalent to the second year of college in this country. You have to pass what is called the baccalaureate. Does that ring a bell?

FYE: Yes.

LENFANT: That was in 1946, something like that, 1946 or 1947. I do not remember. But didn't we send you a copy of my CV, so it is somewhere in there.

FYE: Yes, we have the dates. But you would have been around 17 or 18 at that point?

LENFANT: Yes. I left my parents when I was 18-1/2, something like that. After high school you have to spend one year in premed, and it was during that premed period that I became associated with that surgeon. Then, from there, I went to medical school. I entered medical school, I think, in 1948 or 1949.

FYE: I do have a note here that you received your Bachelor of Science degree in 1948.

LENFANT: Then that was the end of high school. That was the baccalaureate.

FYE: And that was at, now you have to forgive me, I never took French. I do speak a bit of German, the University of Rennes?

LENFANT: Yes, that was the baccalaureate.

FYE: That is where you spent what was the equivalent of two years of college?

LENFANT: That is right.

FYE: All right. And you would have been about 20 then?

LENFANT: And after that you have one year of premed, so I was off by one year. After you have one year of premed, then you go into medical school.

FYE: I will come back to that. I am going to ask you a few more questions about what it was like growing up in France and what sorts of things you liked to do. For example, when you were a boy did you have hobbies?

LENFANT: Oh, yes. I liked to do hiking and mountaineering of some sort and I read a lot. I

spent a lot of time reading. That was the time when the great names in literature were Paul Claudel, [Paul] Valéry. I do not know if these names ring a bell but these were the existentialists of the time if you want. Paul Claudel was an especially interesting writer. He had been Ambassador of France in various countries. It was a very interesting philosophy actually. It was a mixture of existentialism and religion, and I was fascinated by that in those days.

FYE: His writing was a mixture of existentialism and religion?

LENFANT. Yes.

FYE: How do you spell his last name?

LENFANT: It was C-L-A-U-D-E-L, Paul Claudel. He was a very famous writer in those days.

FYE: And the other writer you mentioned, could you spell his name also?

LENFANT: I think it was Paul Valéry.

FYE: So you enjoyed reading.

LENFANT: Yes. I was spending all my time doing that, but that was before I went to medical school. From the time I went into medical school, whenever I had [free] time that was to make money. I never got a penny from my parents from the day I walked out. They never gave me a penny so I had to earn money. Then I got married very young and so it was difficult. What can I say?

FYE: Especially following the war, I would think that that would have been an extremely difficult time in France to find work and without, as you said earlier, the sort of social network of support that now exists in this country and I am sure in France.

LENFANT: Of course, the blessing was that the university was free. You did not pay a penny for university. You had to buy your books and things like that, but there was no tuition basically. When you passed the baccalaureate then you could go into university, and when you were admitted into university it was free, there was no tuition. But, of course, you needed money for other things, to eat, sleep and whatever.

FYE: Certainly. So as a child you liked to hike, you enjoyed mountaineering, you read a

lot. Were there any other interests? I mean that sounds like enough.

LENFANT: No, not that I remember.

FYE: Who were the individuals, if you recall any of them, perhaps even their names, but the people that were your teachers or mentors in some fashion when you were a young person, before you went to university? Were there any people that influenced you at that young stage? Or we can go on to when you were at Rennes, were there people there, or thinking again of the younger phase of your life, if you can remember any influences?

LENFANT: No. These were very tumultuous years in Europe. You have to keep that in mind. Until 1939 or 1940, when the war started, as I said, we were in Lyons. I must admit my recollection of that is pretty vague. I remember that we would all go skiing in the Alps and things of that sort. But the next ten years, from 1938 to say 1948, were very tumultuous years. From Lyons, I suppose we ended up in Paris probably for a very short period of time, and, from there, we went north into Normandy with my mother, and things were more difficult. I was in a boarding school there, too. Then, when the German army began to move into France, the decision was made to go down to the south and that was a project that lasted almost a week. Driving with hundreds of cars on the road and every so often planes would come and machine gun the cars, but these were rather interesting times and eventually we ended up in the town of Pau. When we were in Pau, things were also very, very difficult. I cannot really say anything about what the means of my mother were because I do not know. Now that I think about it, it was not easy for her. Then, when we moved from Pau to Toulouse, from my mother to my father, things were not so difficult. In fact, my father was pretty good in those days. We would often go hiking in the Pyrenees. But that did not last very long because then the Germans got down there, too. So there was no longer any point in being down there, and he was transferred to Nantes. Do you know where Nantes is? It is at the base of Brittany. You have Brittany sticking out and on the south part of Brittany it is just in the corner. So we were put in a

boarding school there for a while. It was in Cholet. Then, now I remember, when my father was transferred from Nantes to Paris, the decision was made that I would finish my high school education up to the baccalaureate in the same boarding school there. So I did not follow my parents to Paris.

FYE: It must have been a very unsettling time for a young person in France to have this war surrounding you and to have to move in response to that so many times.

LENFANT: Oh, yes.

FYE: I am sure that in certain respects it is painful to remember that.

LENFANT: No, it is not painful. I have to tell you I am the kind of person that does not dwell in the past. The past does not really interest me too much. I am much more of a looking ahead type of person. So I would not say that I have blocked that out of my mind, but just that I do not view that as an important part of my life. Talking with you forces me to try to remember all these things and put them in a correct sequence of events which I am not sure I can do. Keep in mind that we are talking about almost half a century ago.

FYE: Yes. I know our older daughter wanted me to write down some recollections of my early life and the like. I had to sit down and do a chronology because I moved about every four years and try to figure out at what stage I was at one place or another. It does require not only just sitting down and thinking but sometimes writing things. We are not interested in that much detail. It is again trying to get a picture in words, just a sense of what your life was like. You are giving us a marvelous sense of that, so I think what we are doing is perfect.

LENFANT: Then the Liberation. I can remember the Liberation very well. I remember listening to the radio actually. In those days we were building radios with a lead crystal, yes, that was what it was, and we had a needle that picked into the crystal. We were listening to the radio when the waves of airplanes were coming and dropped their bombs. Nantes actually and near the place where I was in boarding school were almost destroyed by all these planes, but I remember that very vividly.

FYE: Whose planes were bombing at that point?

LENFANT: The Americans.

FYE: The Allies were bombing the German encampments, but obviously the people that lived there were often in the way in terms of these things...

LENFANT: Well, no. In Nantes there were lots of casualties, I believe as I recall, but not where I was. The boarding school was away from Nantes, maybe 50 or 60 miles.

FYE: So you did not feel physically threatened at that point?

LENFANT: No, I did not. The only experience of threat was really when we moved from Normandy to the south in the early part of the war.

FYE: When, as you mentioned, that caravan of cars came under fire.

LENFANT: Yes. It was so interesting that as soon as people knew—I don't know how they knew--that the planes were coming, people would jump off the car and go into the ditches.

FYE: That is hard to imagine for someone who has never experienced anything like that and, of course, in the United States we have this incredible 200-year history of not confronting that on our soil. So it is hard, certainly for me, to imagine what that must have been like. We talked earlier very briefly about your Bachelor of Science degree in 1948 from the University of Rennes. How did you decide to go to Rennes?

LENFANT: I did not. No. Rennes was, I would say, the university headquarters. In those days France was divided into a number of university areas, if you want. The university is what gave you this final baccalaureate. In the baccalaureate, there are two steps. The first and the second, obviously. You need to have the second to move into university, and that is an examination. It is a pretty tough examination which is given in one of these regions, but I was not in Rennes. I was not living in Rennes, but the boarding school where I was was part of that region. I was in a private boarding school when it was time for me to pass that examination. I went from the town where the boarding school was, which was called Cholet, as I said before, to where that examination was given, which was Angers. If you have a

piece of paper, I will make you a map of all that, it may help you.

FYE: Yes, let us do that. I wish I had brought a map. I realize now that I should have.

LENFANT: [Draws a map of France on a piece of paper]. This may help you.

FYE: Yes, this will be good.

LENFANT: Okay. Let me see how that works. [Drawing] Here is Paris. Pau is somewhere here that would be. I think that is where it is. And then Toulouse is somewhere here. Lyons, that I mentioned, is here. That is Paris. So, we went from Lyons to Paris, and then, in Normandy, we were here at a place that is called Avranches. From there we went to Pau, back to Toulouse, and eventually to Nantes, which is here. I was in this boarding school which is here [drawing] and that may be 50 or 60 miles. Where I went to pass the examination is here. And Rennes, which is the headquarters of this university district, is here. So, if you want, I have this baccalaureate, this degree in science from Rennes, but I did not have to be there to pass it.

FYE: I understand. It really is sort of an administrative university structure, but it is easy to conclude from looking at your CV that you were physically at a place but now as you remind me of and explain to me the structure of education in France, especially at that time.

LENFANT: That is right. It is regional, you see.

FYE: That is very helpful. I should have thought to bring a map, but you have done a wonderful job of showing me where some of the cities that I was unfamiliar with are. But you, in fact, lived in many different parts of France as a young man. Let me retrieve my questions [moved to make room for CL to draw map]. So, one of my questions will make no sense any longer because you were not studying at Rennes. You were studying in boarding schools.

LENFANT: No, in fact, at that time I had never been in Rennes.

FYE: And you did not have to go to Rennes to get your degree.

LENFANT: Now that I think of it I do not think I ever went to Rennes.
I have never been there.

FYE: That is very interesting. In boarding school was there such a concept as having a major area of interest or was it a totally general education at that point?

LENFANT: When you decided to pass this degree, this baccalaureate, that makes you a bachelor of something. You have to decide whether it would be in science or in philosophy, or in humanities, or in literature, or whatever. So, if the decision was to have it in science, between the first and second step of this bachelor degree you focused almost extensively, not uniquely, but quite extensively on the area that you have chosen to pass . . . to get your baccalaureate.

FYE: How many years would that be?

LENFANT: One year.

FYE: For you that was a premedical year?

LENFANT: No.

FYE: I am sorry. That was subsequent to premed.

LENFANT: Do you have that somewhere?

FYE: No. It is coming up, but I understand. Yes, you said that earlier. So was science a very popular area of focus for your peers at that time at that boarding school?

LENFANT: Yes, that school was pretty good in science. They had a pretty strong [program]. In fact, many of my classmates went into medicine.

FYE: When you entered that boarding school did you already have an interest in science? You mentioned earlier that you liked biology.

LENFANT: Yes. I was always interested in that. I was interested in biology but, again, you are talking about the 14-15 year-old or 16 year-old boy. Yes, I was very interested in biology but philosophy also was something of great interest to me. I mean that these people I was reading, Claudel and Valéry, they made you think about things.

FYE: And they were contemporary writers?

LENFANT: Claudel was, or he had just died in those days. I do not remember. Valéry was a little earlier, I would say. It was very interesting. They were both kind of existentialists, but Valéry was more, how would I put it, in the emotional type of literature, poetry, existentialist poetry. He spent lots of time in Haiti, for example.

FYE: Haiti!

LENFANT: Haiti, yes. And he wrote a lot about that. It is coming back. He was a very interesting man because he started by being a Navy officer and then he became a writer. A very, very provocative writer in those days. And Claudel, who was another one of my heroes in those days, was a much more strict type of guy who was bringing more religion into his thinking. If you want, in my own mind, it was the convergence of two very different approaches to life.

FYE: And you just happened to fall upon these two writers that had a lot of influence on you.

LENFANT: Yes.

FYE: Interesting. So in your boarding school, what sorts of courses did you have in science? Did you have laboratory work, or field trips? What was it like?

LENFANT: No. None of that. It was all learning from books and courses, and things like that.

FYE: Lectures and books?

LENFANT: Yes, absolutely. And homework. In those days you had to do homework. Nobody does homework now, but in those days you had to do homework.

FYE: So, again, you did not have personal exposure to laboratory animals, frogs, dissection, or any of that.

LENFANT: No.

FYE: It was all strictly traditional didactic lectures.

LENFANT: No, that came between the first and second steps of the baccalaureate. Then, of course, when I went into premed, I did lots of that.

FYE: Well, you have got me right to where I wanted to be. Could you tell me something about your premedical education, where that was?

LENFANT: By then, you see, my parents had moved from Nantes back to Paris, and after I got my baccalaureate I went there. By then I had made a decision to be on my own. But I went to the University of Paris. I think the reason why I went to the University of Paris is that . . . The only way I could have gone for that [locally] was to go to Rennes where there was a medical school, but I was not terribly

interested in doing that, and I went to Paris. You know it is called the PCB. I am trying to remember in my own mind what PCB stands for, and it is probably physics--yes, that is right-- physics, chemistry, and biology, and that is premed. I do not know if it still exists, but in those days you could not go into medical school unless you had successfully passed the examination after one year of PCB.

FYE: I can remember that same experience here in the United States in college for me. In Baltimore, it was the same thing. In fact we had 12 credits of physics at Johns Hopkins. It had a big engineering program and graduate programs and yet they had only one physics course, 12 credits for the physics majors and for the poor struggling premeds who were, of course, more biologically focused. So I understand what you are saying about the PCB and that you had to be successful in each of those areas in order to go on. So, by that time you had already decided when you were in premed, [that] you were interested in going into medicine.

LENFANT: Yes. In going into medicine.

FYE: When you first thought about that, did you have any idea of what you would do in medicine?

LENFANT: Yes. I can tell you that I was absolutely fascinated then by neurology.

FYE: Neurology!

LENFANT: Yes, that was really something that I wanted to do. But then something happened, which was that I needed to make some money, and I found a job as a dishwasher in a laboratory, if you want, in a hospital which had just opened. That was in 1951 or 1952, something like that. I was already in medical school struggling. So I found that job in that hospital which was a cardiovascular thoracic surgery [hospital]. That was all they were doing, just cardiovascular and thoracic surgery. The hospital was called the Hôpital Marie-Lannelongue. That is what you see on that book there that you brought.

FYE: Oh, yes. [Note: Fye had brought a copy of Lenfant's 1956 dissertation that was published in Paris.]

LENFANT: I went there to wash dishes in a laboratory to make money. There were two

fellows there. There was a surgeon, who was a very famous surgeon in the [Second] World War by the name of Charles Dubost. The laboratory where I was working was directed by a fellow by the name of Gabriel Nahas, who was a kind of crazy character. He was a very crazy but very interesting guy, actually. He was a war hero of the Resistance. He had done lots of good during the Resistance, the reason being that he had been educated in part in this country. Just after the war, or at the end of the war, whatever, he went to the Mayo Clinic where he had a position that I could not define because I do not know what it was, but I know that he was at the Mayo Clinic. He was probably in the cardiac catheterization laboratory or something like that. But, anyway, he decided to go back to France. He was very interesting. I think he was born in Egypt, but, after that, he had dual nationality between the U.S. and France. He gave me a job, and I guess he thought I was doing a good job, as little by little I moved from washing the dishes to doing experiments and working. Charles Dubost was a pioneer in cardiac surgery. For example, the first aortic graft in the world was done by him and also the first mitral commissurotomy had been done by him, worldwide. So, by then, of course, he knew about the development of open heart surgery in this country, and Gabriel Nahas reoriented the laboratory into a laboratory of experimental surgery to develop approaches to open heart surgery. Because I was doing very well there, I moved up through the system and eventually I became the head of that laboratory, before I came to NIH. This surgeon, Dubost, did a lot for me and I was one of his protégés of sorts. I toyed with the idea of becoming a cardiovascular surgeon, but, in those days, the medical system was a little bit of a feudal system in Europe. Even in France it was very Germanic, in a way, you had the Herr Professor, and if you were not part of that family . . . In fact, the joke was that to succeed you had to be part of the bishop's family.

FYE: In almost a religious sense, a family of bishops.

LENFANT: Yes, if you were not part of that, then it was very, very difficult. So I focused on my experimental work where I was very successful at that time. It is interesting.

Not too long ago I saw here in the U.S. this French surgeon by the name of Carpentier who was trained by Dubost, but Carpentier came into my laboratory often to learn to do open heart surgery in our laboratory at the Centre Marie Lannelongue. Many of the big names of cardiac surgery in France actually spent some time in my laboratory.

FYE: It is fascinating. It reminds me of an interesting experience when I was in medical school at Johns Hopkins. We had the so-called dog laboratory as part of our surgical course and Vivian Thomas, Alfred Blalock's African-American laboratory technician, was actually the instructor in that

LENFANT: In all these years between 1952 and 1956, while I worked in this laboratory going up the ladder... Because, by 1956, Nahas had returned to the Mayo Clinic and then he went off to Columbia. He spent the next 20 years as Professor of Anesthesiology at Columbia University. But, anyway, during all these years all the big names of surgery in Europe were coming to our hospital and through that laboratory and it was very interesting. Eventually, our greatest success was that the first cases of open heart surgery in Europe were done in that hospital and I participated in that. I have a number of papers on open heart surgery, the first cases of interventricular septal defect in Europe and things of that sort. I think I made a few contributions to our laboratory that were quite interesting actually. But that was when I met Michael DeBakey for the first time; [it was] in 1953, I think. He came [to the hospital] to show something that he had done. He came to demonstrate how to do it. I cannot remember exactly what it was, but he came, and I remember that very well. DeBakey and I became friends and ever since that time we have a very nice rapport. Now that may not impress you but it is close to 45 years.

FYE: I think that is very impressive. To have that professional and social friendship for such a long time is unusual. We have the advertisements in the U.S. for the Energizer bunny for batteries and I think Michael DeBakey is sort of like the Energizer bunny. He just keeps going and going!

LENFANT: I have tremendous respect for DeBakey. He has his detractors, but I think he is a good guy. So, these were very exciting years. Of course, Richard DeWall, whose name you see in there, also came to show us . . . You see the big deal in those days was to find a way to keep circulation going while you were opening the heart, and taking it off from the circulation. So that led to all kind of various approaches which were to freeze the entire body, to freeze just the heart, to stop the heart with potassium injection—that is what the British were doing. There was a fellow by the name of Melrose actually who was doing that—or to develop an extracorporeal oxygenator system. DeWall, who was working with Walter [Walton] Lillehei at Minneapolis came to show us what he was doing, and I personally modified the system. The big problem, of course, was that the oxygen was bubbling through the blood and that led to the formation of a number of blood clots and micro blood clots and things of that sort. The risk of that, of course, was to send some emboli somewhere, in the brain or wherever.

FYE: Well, we are moving very quickly now. I want to be sure I have not overlooked some things because again it is all fascinating.

LENFANT: But you see during those days . . . When I think of what really kept me from becoming a real surgeon, or, if you want, a professional surgeon . . . Even though I had that job in that laboratory, that did not pay very much because, first, I was not spending too much time [at it] because I had to go to school, and so during the summer vacation I was [working]. In fact, I had one year of time off to go replace a physician in the countryside. You could do that in the French system. In the French system, medical school is five years and the first two years are laboratory work and then lectures. In the morning you had clinical clerkship in those days. I do not know what it is now. But, in those days, during each of the five years in the morning you had clinical clerkship and you had to work in the hospital.

FYE: So even as a first-year medical student you did that?

LENFANT: Yes.

FYE: So for five years in France at that time you were involved with patients in the

hospital.

LENFANT: And in the afternoon, you had courses....beginning with the third or fourth year, I just do not remember. I remember that the fifth year was fulltime clinical clerkship, but in the third and fourth year you do more clerkships and either at the end of the third year or fourth year you were allowed to go replace a practicing physician. He was responsible [for you] but basically you were on your own because you were doing this replacement when the physician was on vacation or going on a trip or something. [Lenfant receives a telephone call] I did a lot of that because that was paying wonderfully. We were making lots of money. I mean you would go and do that for six months and you could live another six months not having to earn money. So I did that a lot. In a way, the impact of that was twofold. First of all, it made me realize that if I was practicing in the countryside, [I would be] delivering babies like crazy. I delivered as many as 200 babies and saw all kinds of people. It is something that I have never forgotten. I will always remember being in the countryside and a young woman or young girl coming in and pretty much tearing her clothes off and saying I am pregnant, can you give me an abortion? You know in the French system you could not do that in those days. I mean, I almost passed out or fell off my feet and, of course, I never touched that, but that was a very impressive thing. Anyway, what happened with all that was it was very clear that, if I was spending time making that money, I could not spend time to get myself into a competitive position to become a cardiovascular surgeon on my own. The second thing, which, as I look back, has probably been more important to me is that I really got involved with human drama, the people with their diseases, their family problems, and remember that was in the early 1950s, and things were very different from what we know now in living conditions. That was in the countryside. I would go and deliver babies at home. I would sit at the bottom of the bed and it was a feather mattress or something like that and the woman would disappear among all these feathers! You know those were fantastic times. I have no regrets that I had done that,

absolutely no regrets. It gave me a sense to have a better understanding of human beings.

FYE: I think that must have been fascinating because that really is being a general practitioner and being this solo person.

LENFANT: Yes. And I was doing that in this part of France, smack in the middle, where people were 50 years behind the times. It was an unbelievable event, but I remember being called to a farm where somebody had had their hand cut off with some machine, and it was quite something.

Anyway, I was making money, and I kept on working in this laboratory. The head of the laboratory was a fellow by the name of R. Sauvage, who was a classmate of André Cournand. So Cournand would come. I hate to sound as if I am bragging but I really think in a way I was the main focal point of many visitors, like a beacon in the hospital because we were doing things that nobody else was doing in France, or even in Europe, I would say. People would come from Germany and spend time in our laboratory and see what we were doing and so on. And Sauvage introduced me to Cournand. No, before that actually I made my first trip here [to the U.S.]. Dubost, the surgeon, told me to come to this country because the Americans beat us to it in the sense that the first case of open heart surgery came from Lillehei. He was the best at it, and we thought we were much better! So Dubost said to me, "You have to go there and see what they are doing." He really sent me like a spy. And we arranged for a trip that lasted something like three months. I can tell you where I went. I stopped in New York, I think, to say hello to Cournand. I went to Case Western in Cleveland.

FYE: [Was it] Carl Wiggers or what drew you to Case Western?

LENFANT: I think his name was Cors or Dros, [?] or something like that.

FYE: But he had been in. . . .

LENFANT: He was a cardiovascular surgeon. I went to the Mayo Clinic, John Kirklin was there. And John Kirklin and I, we hit it right. There, too, I developed a friendship that I still have with him. I spent three or four days with him, and we really hit it

right. I went to Minneapolis where there was, of course, Lillehei and DeWall and other big names, I forgot who they were. I went to Denver, where there was a fellow by the name of Henry Swan. Hypothermia was his thing. I went to Houston to see DeBakey, and I went to NIH to see Glen Morrow, and then I went back to France. When I went back, Dubost asked, "What did you learn?" I said, "Well, you know something, they do research that we don't do here." So we transformed the laboratory to make it much more, not [just to be] the testing ground that we probably were before, testing pump and filters and how to put the best cannula in dogs and those kind of things, but really to try to understand the biology of open heart surgery. By then, you see, Cournand, whom I had met briefly during his first trip, became kind of interested in me and suggested to Dubost--if you want, Sauvage as well as Dubost--to send me back to the States for a longer period of time really to do research. And then in that same hospital there was another laboratory of pulmonary function and pulmonary physiology.

FYE: This hospital is . . . because I do not know that we have actually said it, I will put it in the record.

LENFANT: The Centre Chirurgical Marie-Lannelongue, and Sauvage was the director.

FYE: What part of Paris is that hospital in?

LENFANT: It was, well, if you went in the direction of Orly airport.

FYE: It is in that general direction?

LENFANT: Yes.

FYE: You said earlier it was a hospital that specialized in thoracic and cardiovascular surgery.

LENFANT: It had been created by the Social Security. It was not a university hospital, it was a Social Security hospital, but all the faculty were big shots from universities. Dubost was the cardiovascular surgeon, Sauvage was the thoracic surgeon. All the care was free in that hospital, and it had been created to take care of what were called in those days the blue babies, basically congenital heart defects.

FYE: So it was created in response to the development of the very earliest heart surgery

or extravascular surgery?

LENFANT: Oh, yes.

FYE: When you were there it was quite a new facility?

LENFANT: Yes. In fact, everybody in France was jealous of that facility because the Social Security was putting lots of money in it and also it was the only hospital where there were research laboratories for that kind of work, experimental surgery. I think that hurt.

FYE: But, as you mentioned, it sounds as if it became even more research oriented and was not simply answering the practical questions. It sounds like the focus initially was on practical things that they could use in the operating room, but then the transformation was toward a more basic research mission after you traveled to the United States and saw the programs in the cities you mentioned.

LENFANT: That is right.

FYE: Now, how old were you and what stage of your training were you at when you first visited the United States and visited those cities?

LENFANT: My first visit here was in 1956.

FYE: All right.

LENFANT: So basically I was 28 years old.

FYE: And by that time you had received your medical degree?

LENFANT: Yes. You see it took me a while to get it. I got my medical degree in 1956. I could actually have gotten it in 1954, but, remember, by then I had five kids.

FYE: I did not know that! This will be a story as well. We will get into that.

LENFANT: That was very difficult. I do not know if it should be part of this, but my wife by then had been diagnosed as having multiple sclerosis, which turned out actually not to be multiple sclerosis. The true diagnosis was made in the United States after we got here. But it was difficult. You can take that for granted. Anyway, I got my degree in 1956, and shortly after that was when I made the first trip. By then you see, Nahas had left, and I had been made head of the laboratory. Nahas had come back to this country.

FYE: So from dishwasher to head of the laboratory in less than six years!

LENFANT: Yes. So I came to the U.S., and, again, when I went back, I made it very clear that if we wanted to beat the Americans we had to do more research. So Cournaud and Dubost and Sauvage said, “Why don’t you go and learn to do research.” Now in the hospital there was another research laboratory which was much more pulmonary oriented. One person also that I visited during that time [in the U.S.] was Richard Bing with whom I had a very nice rapport. I still do now actually. I was doing lots of work on coronary blood flow when I was in France, and Bing was a guru of coronary blood flow. So I went to see him to discuss my experiments and things like that with him.

FYE: Was he in Detroit at that time?

LENFANT: No, he was in St. Louis.

FYE: He was in St. Louis at that time.

LENFANT: Yes, it was at Washington University. All these things are coming back.

FYE: That is great, by the way.

LENFANT: The other man in the Paris laboratory was a very distinguished researcher. He had spent time in this country. His name was Pierre Dejours, he must be mentioned in here [referring to his 1956 thesis]. He was Professor of Physiology at the University at the University of Paris, but he had been in the U.S. Here it is. Dejours, and his first name was Pierre. He said, “If you want to learn to do research”-- he had an impossible personality but he was a good researcher--“you should not do it in your cardiac surgery thing because surgeons don’t know how to do research.” He was much more basic research than cardiac surgery that Lillehei or Dewall or all these people or Michael DeBakey [were doing]. He had been in this country at the University of Rochester with Wallace Fenn.

FYE: Fenn. Yes. A very prominent physiologist.

LENFANT: So he said to me, “That’s where you have got to go.” The deal was that I would go in Wallace Fenn’s Department—he was the head of physiology at the University of Rochester--which was probably the premiere department of physiology in this

country. Wallace Fenn, in case you do not know, was the main advisor about adaptation to high altitude and hyperbarism, that is living in the submarine, during the war, and his whole department was really sponsored by the Navy and the Air Force. It was the premier department in those days.

FYE: It raises an interesting point if I could just interject a couple of thoughts. First of all, you were told to study with a person, you were not necessarily told to go to a specific institution, but, as you tell the story, it is obvious that the reason that his department was so successful, and perhaps to some extent at that point he was successful, is that he had government funding. He had an unusual degree of funding, I am sure, because his research was viewed as critical to our defense structure at that point with the high altitude and the underwater physiology.

LENFANT: Yes, absolutely. I would be in his department, but, in fact, I worked specifically with a fellow by the name of Herman Rahn. I went to Rochester and, shortly after that, Herman Rahn became the department chairman of physiology at what in those days was called the University of Buffalo, and so I moved to Buffalo. And Herman Rahn was just as distinguished as Wallace Fenn. Herman Rahn was a member of the [National] Academy of Sciences, as was Wallace Fenn, and they were very distinguished people. Herman Rahn's main interest was in gas exchange in the lung and at the periphery. I viewed that as being a kind of a compromise, if you want, in the things that I wanted, what brought me there, which was cardiovascular surgery and pulmonary, coronary circulations, and things of that sort. I spent almost two years in Buffalo. That was really extraordinary. From there I went to spend some time with André Cournand which was the worst time of my life. Cournand was impossible. He was impossible.

FYE: Was it at that stage of his life or was he always impossible? I know he had just won the Nobel prize.

LENFANT: I do not know. I think he was always impossible, he really was. He terrorized absolutely everybody. He could not say anything nice. If it had not been for his secretary that he eventually married, this place would have been in . . . he would

not have had any friends and students. But there were people from all over the world going there. It was the same thing actually with Herman Rahn. There were people from Korea, from Europe, from Asia, from Australia. It was a booming place. And New York was also another very interesting place. There were people from all over the world coming there and that gave you an opportunity to meet these people. That is where I met Al [Albert] Fishman. I do not know if you know him. Fishman was up town, and Cournand was downtown.

FYE: Cournand was at the Columbia branch of Bellevue, but Fishman was at the University. . .

LENFANT: Where Dickinson Richards was, and I would go up there very often. I also became fairly friendly with the Dickinson Richards, much more friendly than I was with Cournand. Cournand was just impossible.

FYE: It is fascinating because you are both French, so you would have assumed that if anyone could relate to him it would be you but it did not work.

LENFANT: I can tell you--eventually I will get to that I suppose when I am into this--but when I came back to stay in this country then he stopped talking to me for almost 15 years, 20 years. It was quite interesting. Yes, Fishman was uptown. Mary Jane Jesse, who later was the president of the American Heart Association.

FYE: J-E-S-S-E?

LENFANT: Yes. Wasn't she one of the presidents of the Heart Association?

FYE: It could be. I know the name.

LENFANT: In the late 1970s, I think, she essentially was perhaps the first woman president of the... I do not know if she was president or pretty high up in this organization. But there were lots of very interesting people there. So I spent, I do not know, over a year there and then eventually went back to France to run my laboratory. But then I received a letter from Seattle offering me a job at the University of Washington. You see when I was in Buffalo, I met lots of people in the country. Herman Rahn was really pretty darn good. He would take us to all kinds of meetings. In the late 1950s, I do not know where you were at that time and what you were doing, but

those were extraordinary years, and NIH was really beginning to blossom. Research had become something that people were thinking about and universities were going into research in great part because of NIH being so flourishing at that time. It was a very exciting time. Anyway, Herman Rahn would take me to the physiology meetings. We would go to the clinical meetings, and I actually met lots of people during that period of time, although I never met [Robert] Bob Williams from Seattle...

FYE: The endocrinologist?

LENFANT: That is right. Eventually one day, after I went back to France, he sent me a letter to ask if I would be interested to come and have a faculty position at the University of Washington. By then, I have to say my wife was driving me crazy with all her problems. It had also become very clear that I would not become a cardiovascular surgeon. I could have stayed in this [French] hospital, but I wanted to have an academic position. Again, that hospital had nothing to do with the university, and the only academic position that I could find was in Lille which meant that I was traveling maybe 250 miles, twice a week.

FYE: Could I ask you to draw Lille on your map here?

LENFANT: Lille is somewhere here. So, that was driving me crazy. I was spending more time on the train not doing what I wanted to do, and so I did not hesitate when I said, "Okay. I am coming." Six months later I was in Seattle.

FYE: At that point, how many children did you have?

LENFANT: Five [already five children], all born here.

FYE: All born in the United States?

LENFANT: No. In France.

FYE: But did they travel with you to the United States?

LENFANT: Not the first time.

FYE: Not on your first tour of all those various cities.

LENFANT: And not the second time either.

FYE: When you were in Buffalo?

LENFANT: Yes, they stayed in France. But my wife was with me. In fact, it was probably good for her and for the children not to be together during that protracted period of time. But, by then, there were some pretty good signs that perhaps it was not multiple sclerosis that she had, and as it turns out, I do not know if you heard about Charcot's disease.

FYE: I have heard of it, but I do not...

LENFANT: It is basically a disorder which has all the manifestation of multiple sclerosis. I mean it is amazing. The diagnosis was made pretty much finally by a neurologist at the University of Washington. So I came back to the United States to the University of Washington where I stayed for about, well not quite, eleven years.

FYE: Who was caring for your children in France? How was that working?

LENFANT: Relatives. Not my parents. By then, I would never see my parents. When we made the decision to immigrate to this country, I think I gave them a phone call, and they said fine. That was the end . . . I mean, I really had a very bad rapport with them, in fact, I had no rapport at all. If we would talk to each other, gosh, I do not know if it was once a year even. I was too revolutionary, that was bad enough for them, but when I decided to get married without asking them beforehand, that really did it.

FYE: It was the final straw.

LENFANT: Yes. That clearly did it.

FYE: Is there a term in France that is like the term Victorian in England, because you are describing, I think, a Victorian kind of approach where parents are strong authority figures, the father especially, and you do not do things like that.

LENFANT: Oh yes. I do not know if there is a term. If there is one, I forgot it. But they could not accept my wife. She was not of the same social class. She was not this, she was not that. I mean on and on, and on.

FYE: So, at what point did your children join you here in the United States?

LENFANT: When we decided to come and immigrate to this country.

FYE: And that was what year?

LENFANT: In 1960.

FYE: At that point you were at the University of Washington in Seattle?

LENFANT: No.

FYE: I do have these notes, and if I would follow my notes I would sound smarter!

LENFANT: Yes. Okay. My wife and I were here for several years, in Buffalo and New York. We went back to France where the children were for a short period of time, received that invitation from Seattle, and all of us moved back with the children to Seattle. And that was in 1960.

FYE: I want to go back and fill in just a few blanks about Dubost and a few other people because obviously he had a great influence on you. What was he like, and now I am going to ask you to think about him in all different ways, as a surgeon, an investigator, a person, a mentor, all that.

LENFANT: He was an astonishing fellow actually, Dubost. You know I saw him again a few years ago at the French Cardiology Society. They invited me to the meeting to make me an honorary member, and he was there, which was shortly before his death actually. He is dead now for probably 12 years. But he was an amazing fellow. He was always elegant. I mean that he dressed like he was coming out in a fashion competition or something like that. Very distinguished. When he was operating, his fingers were just like a pianist, absolutely amazing. And compared to most surgeons he would never get mad during surgery. You know sometimes surgeons have a way to get mad but not him. He was exquisitely gentle if you want, but very firm. When he said something, people would do it. He was probably the foremost surgeon in France if not in Europe. A very remarkable man. He was married to an extraordinarily beautiful woman, and do you know what his hobby was, it was to cook.

FYE: Really. His hobby?

LENFANT: Yes. That was his hobby. To cook.

FYE: That is interesting. How many professional men, especially in France, would cook in that period?

LENFANT: He was an exquisite cook and a very remarkable fellow. But, anyway, his appearance was so dignified that we used to call him Caesar. You know in the Roman empire. He had the appearance of a Roman emperor. He was a very interesting guy. But he was very good to me. I said that he was very good to me because to succeed in those days you really had to be a competitor, and when you want to compete at that level often people do it in a way which is a little devious, not straightforward. I was not doing that. I should have but I did not do it. I think that was the reason why he liked me. And, in a way, I was working for him if you want--not quite, he never said that I was working for him-- but he really viewed me as being necessary for his success. I think I was, actually, because of the work that we did. For instance, we did the first cases of open heart surgery and then people from all over Europe were coming to see him. We were part of the magnet, if you want, the whole unit was.

FYE: He must have been very proud of what you accomplished in that laboratory. I can sense, as you say, that people may have initially been attracted by his reputation but then your laboratory was such a vital part of that entire program, people could not help but . . .

LENFANT: We were the only one in Europe, you see, and there is no question at that time that we were the only one in Europe. Not long ago I saw a surgeon who in those days came to see us from Germany. I think he was in Munich in those days, and eventually went to Berlin. He was Emil Bucherl who was one of the pioneer cardiovascular surgeons in Europe. And he was the epitome of what was happening there. He would come all the time to spend a few days to see what we were doing. It was really an interesting time. You know that when you are in an environment which is fascinating and so exciting, you perhaps forget to do a number of things that you should do because you have the instant excitement of the place. As I look back, I probably should have paid more attention to me and done things which would have certainly served me professionally better. I do not know. As I look back I have no regrets. If I had to do it again, I would probably

do exactly the same thing.

FYE: I was going to say that it is hard for me to envision a more successful career path. You might have envisioned it somehow being maybe more efficient in retrospect to go to where you are [now] but it is quite a remarkable career.

LENFANT: Oh, I could be a big surgeon someplace and certainly making much more money than I am making.

FYE: Right. The other thing I want to be sure that I understand, and you may have touched upon this, I just may have forgotten it in our conversation, but how was it again that you got to this particular hospital working as a dishwasher or a laboratory assistant?

LENFANT: One of my classmates that was in the P[hysics] C[hemistry] B[biology] knew Gabriel Nahas, and she is the one who basically put me in contact with him.

FYE: I wonder if you could just speculate a little on how your career might have been different had she never put you on to Nahas, and had you never gone to that hospital.

LENFANT: I probably would be a neurologist someplace, perhaps a neurosurgeon. I do not know. But I think that is what would have happened to me.

FYE: Isn't it fascinating though how that one obviously sort of chance discussion or chance opportunity completely redirected your professional and other aspects of your life.

LENFANT: Wash the dishes and handle the dogs.

FYE: So you really were doing all of the practical stuff. Did you get bitten?

LENFANT: No.

FYE: What were the dynamics . . .

LENFANT: One thing that we did in those days nobody does today. This Hôpital Marie-Lannelongue is smack in the middle of the town where there were apartment buildings, and the dogs were housed in kennels on the roof. Of course, they were waking up all the neighborhood. So what I was doing was to cut their vocal chords. I was an expert in cutting the vocal cords.

FYE: It is interesting because at Hopkins they had the dog kennels on the roof too and I could hear the barking. But it raises an interesting question because my earliest research into the history of physiology related to H. Newell Martin at Johns Hopkins and Bowditch at Harvard, and one of the things that created a tremendous aggravation for both of them was the antivivisection movement. What was that like in France? Was there any problem?

LENFANT: Not yet. Remember it was the late 1950s, mid 50s, or early 50s.

FYE: They gave Claude Bernard a pretty hard time, but I guess in the generations that had passed it had quieted down.

LENFANT: But also you see it was the blue babies . . . I mean, this hospital was perceived as something very unique, something very special in France.

FYE: I am sure it was. I remember when I interviewed Richard Bing several years ago now, he told me when he went down to Baltimore from New York, Blalock had asked him if he would consider starting the first physiological laboratory which was primarily focused on diagnosis from Blalock's point of view but Bing viewed it as an opportunity really to continue his physiological research. But Bing said as he took the ferry from Delaware to Maryland--of course, there was no bridge at that point--there were six blue babies or cyanotic kids on the ferry with him. You used the word magnet for your laboratory in Paris and obviously Johns Hopkins at that point, this would have been in 1946, was a magnet for blue babies from all around the world. But you certainly were in a unique context there in Paris with Dubost, going there to earn some money to help pay, not your education per se, but all of your living expenses and all of the other things that you needed. That was your entrée into this whole career that we are going to keep talking about for quite a long while. It is fascinating, though. Now beyond Dubost, you had mentioned Nahas in that hospital and you had mentioned Sauvage.

LENFANT: And then also Dejours one time.

FYE: Right, he was the other person you mentioned. So you had a number of mentors and people that obviously you were learning from and eventually they were

learning from you.

LENFANT: In many ways as I mentioned earlier, there was a group [around] Dubost, and Nahas. Then, there was DeJours on the other side who thought these guys were not doing real research and Sauvage was the kind of grand figure sitting in the middle. I was kind of between all these forces. It was interesting and I always managed to find my way between all these fellows.

FYE: I am sure that they had egos, they had their own interests and their own agendas, and you were in that mix, but substantially younger than all of them.

Continuation of interview of Dr. Claude Lenfant on 7 November 1999, in Atlanta, Georgia. The interviewer is Dr. W. Bruce Fye

FYE: That is an interesting story. We are now just at the point where I am going to ask Dr. Lenfant about his 264-page monograph that reported in 1956 the results of his research with advances and adaptations of the Lillihei-DeWall pump oxygenator. He has asked me where I found this book and this gets back to the intersection of my interests in book collecting and medical history. Actually my book collecting has merged, as you know, into a book business 20 some years ago since 1972. I found this book on the internet, searching through the various things that have huge listings of literally millions of titles of out-of-print books. I put your name in and this popped up.

LENFANT: Really?

FYE: I would never have known to look for this because I had no idea that it was such a substantial monograph. But it came from a bookseller in France, and so it came over the ocean at just the right time. It has a bit of a tear out of the cover but one

cannot be picky when I suspect there probably are almost none of these available anywhere today. Would you tell us about this monograph.

LENFANT: I am in the process of moving, and I have lots of books which are in boxes. I do remember that where I was living before I had two or three copies of that book which were with me. I must admit I do not know whether I threw them out for the sake of reducing the inventory of things or not. If I did not throw them out--I will know that in December because I am going to unpack--I will send you a perfect copy.

FYE: We will trade.

LENFANT: One thing [I can say is that] those were astonishing years. What you see in that book is basically [my research] between 1953 and 1956--that was my thesis to get my degree--and it really [describes] some of the work that we did. I do not know if you noticed that I invented a pump. Did you notice that in the book?

FYE: I have to say my biggest handicap in this interview is that I do not read French.

LENFANT: Yes, but here, you see, is a picture of it.

FYE: Oh, there is the drawing of it with your....

LENFANT: That is a picture, it is not a drawing.

FYE: A picture of it.

LENFANT: You see, the Lenfant-Dubost....

FYE: Pump.

LENFANT: Yes, we invented a rotary pump, that you see here, for the heart-lung machine. Another thing too that I invented was a filter that you see here. Unfortunately, I

was very naive and I never got a patent. I got my name on it but no patent so I never made any money. There is the filter that we invented.

FYE: Claude is referring now to page 60 of the monograph.

LENFANT: Yes. In fact, that is the girl who put me in touch with Nahas, Jeanne Rouanenet.

FYE: Let us spell her name again for the transcription.

LENFANT: R-O-U-A-N-E-N-E-T.

FYE: Now, if I am not mistaken, that name is very similar to a nineteenth-century French...

LENFANT: Painter?

FYE: No, a person that actually did work on auscultation. I will have to look into that, but that is curious.

LENFANT: Anyway, Nahas had spent some time in Toulouse, and she was from Toulouse too. That is how I got to know her in medical school because talking among students of what we had done I mentioned Toulouse, and she said, "Oh, I was from Toulouse." Eventually that was the link between all of us. Here it is you see, that is apropos a new blood filter for big blood flow.

FYE: A 1956 publication, yes. Tell me, I wonder if you could go to the introduction and perhaps give us a synopsis of what you wrote in the beginning of this monograph. Right in the very beginning, I think, you have a little introduction. Actually, it is Dubost that wrote the preface.

LENFANT: Dubost.

FYE: Maybe you could tell me what Dubost had to say about you at that point.

LENFANT: He says nice things about me!

FYE: Tell us what he said. I think it would be very important to know what he said about your thesis.

LENFANT: That reminds me of something else. Dubost had come to the United States before me, and he says, "More than a year ago I realized that for us to make some progress we had to get much more involved in research." He mentioned the places that he visited, and then he said that during that period of time when he came back [to France], it was at the Hôpital Marie Lannelongue that he discovered me, if you want, and got me involved with all that, and he mentioned what we did, which had an impact; nice words, that is all.

FYE: Now is this your dedication?

LENFANT: You see that all I said was just to say thank you to the people who supported me and to Sauvage and Dubost and Dejours, who was the Director of the hospital. The administrative director of the hospital was this fellow.

FYE: Dejours

LENFANT: And these were two of my collaborators. You see that was the girl that I mentioned and this fellow, actually when I left to come to the United States, he succeeded me as the director of the laboratory.

FYE: And that is Weiss?

LENFANT: Weiss, and the two of them got married. But the thing which is interesting is that this fellow was a very smart guy but absolutely unable to relate to his environment and society. The thing that is interesting is that he was the son of a woman who fought and established the right of women to vote in France.

FYE: Again this was Weiss. What was his first name?

LENFANT: Michel.

FYE: And he was the son of a suffragette?

LENFANT: That is right.

FYE: Well, this is a very substantial monograph.

LENFANT: Oh, yes. I think there is lots of stuff in there. I must admit that I do not quite remember what is in there but lots of work went into that.

FYE: How typical of theses would this have been? It strikes me that this was unusual in that it was such basic research.

LENFANT: Yes, it was very substantial.

FYE: Did you have the feeling at this point that open heart surgery was going to explode the way it has based upon these advances in part?

LENFANT: Yes. There was no question about it. Even in the few years that I was deeply involved with it, it was absolutely extraordinary what happened. There was total hypothermia, selective hypothermia for the heart, stopping the heart by injecting potassium in it, developing new oxygenators, this one bubbling oxygen through the blood, or by diffusion through permeable membranes, the development of membranes. It was amazing, working on the plastics to make sure that they were completely inert and not causing problems, especially the agglutination of platelets. That was a big, big problem. In fact, many of these patients were actually dying from that. It was a very interesting to be at the beginning of all that [research]. The platelets would agglutinate from the plastic and then eventually find their way and go obstruct the pulmonary capillaries. That was causing some

tremendous bursts of pulmonary hypertension and basically many of these patients would die from that.

FYE: Now the surgery, of course, was done in this hospital.

LENFANT: Yes.

FYE: Did you have a pathological department?

LENFANT: Yes. In fact, one of the fellows here that I mentioned was the pathologist. Roussel was the chief of the laboratory.

FYE: Oh, yes, Roussel. So basically you were very self contained in this hospital.

LENFANT: Yes, I tell you this hospital was just fantastic.

FYE: About how many beds would it have had?

LENFANT: Maybe 200.

FYE: And these were all patients coming for cardiac surgery?

LENFANT: Or thoracic surgery.

FYE: Or thoracic surgery. Were they still doing tuberculosis surgery at that point?

LENFANT: Yes, they were doing some tuberculosis surgery and then, of course, [surgery for] lung cancer.

FYE: Do you have a sense in terms of Dubost's activities at that time, what percentage of his operations would have been thoracic operations?

LENFANT: He was only cardiovascular [surgery].

FYE: He was purely cardiovascular?

LENFANT: Yes. Purely cardiovascular.

FYE: So Sauvage was the . . . ?

LENFANT: Sauvage was the thoracic one, and there were two or three other fellows.

FYE: But it is interesting that Dubost was making a career out of something that ten years earlier did not exist for all practical purposes.

LENFANT: Let me make sure that you do not misunderstand. He had a career, he already was a bona fide, in fact, the leading cardiovascular surgeon in the country, not to say in Europe. But what happened when this hospital was created, [was that] the Social Security contracted with the University of Paris to ask that one of their surgeons come to work there in addition to still working in the university hospital.

FYE: So Dubost worked in both hospitals?

LENFANT: That is correct.

FYE: He came and did his cardiac surgery here.

LENFANT: He was the student or the pupil, if you want, of a very distinguished cardiovascular surgeon, mostly vascular I would say, by the name of d'Alaines. D'Alaines was the chief of cardiovascular surgery, at the Hôpital Broussais.

FYE: How do you spell that? We should just say it for the tape probably too.

LENFANT: B-R-O-U-S-S-A-I-S, Hôpital Broussais.

FYE: A very famous French physician, by the way, of the early nineteenth century.

LENFANT: Yes, that is right.

FYE: And the name of the surgeon that you referred to was d'Alaines.

LENFANT: Yes. D'Alaines was the chief of surgery in this hospital, cardiovascular surgery, and Dubost, who was much better than d'Alaines as a matter of fact, was the second in command there. In fact, when d'Alaines retired or died, which was after I had left, then Dubost moved back to become the chief of that department.

FYE: Now how did the patients get to this hospital? What were the dynamics of those patients getting to that highly specialized hospital?

LENFANT: Remember that the [French] Social Security system, which is basically the medical care system--it is not something like here in the U.S., it is not just to pay retirement, but it is to provide care--is a national program. I have to guess a little here, but I suppose that the [French] Social Security is very much working with the university hospitals and all that. Therefore the university hospitals--none of them [were] doing this kind of thing that was done in this hospital [Centre Marie Lannelongue]--would refer by way of the Social Security their cases to that hospital, not all but certainly a large number.

FYE: So, somewhat in the way we think in the United States of primary care, and then secondary . . .

LENFANT: It was a tertiary hospital.

FYE: . . . or even beyond tertiary in some respects . . .

LENFANT: Yes.

FYE: Wasn't it because it was so much on the cutting edge [and] because the university's other hospitals in Paris would not have had these facilities?

LENFANT: To illustrate that the system not only was successful then but has flourished, I understand that this hospital still exists now but it is no longer in the middle of Paris. It is outside Paris, and I think it is a 500- or 600-bed hospital, apparently a big, big hospital.

FYE: But still focused on cardiovascular surgery.

LENFANT: I have never been in the new hospital but I believe so.

FYE: The other question I am thinking of about is that back when you were doing this country practice, what were the mechanisms of you getting a patient [into a hospital] that you felt needed more care than they could get locally? I should ask did you have a little hospital or was it strictly an outpatient practice?

LENFANT: It was strictly outpatient.

FYE: How would you get your patients [further care] if they needed hospitalization?

LENFANT: I would refer them to a hospital close by.

FYE: And then if they needed more sophisticated care than that . . .

LENFANT: Then that hospital would take them, yes.

FYE: . . . they would keep referring them and keep going down the line. So a patient, to get to this hospital, your hospital, the heart and cardiovascular surgery hospital, might have gone through two or three or four referrals to get there?

LENFANT: Correct, or if they had gone to a pediatric cardiologist that person may have referred them directly there. Kids were coming from all over France to that hospital. But when I was doing my country practice, I was living in the home of the physician, and two or three rooms of his home were for his practice. Some days I would see 30-40 patients. That was hard work!

FYE: I am sure it was, and you were still at a young stage of your career.

LENFANT: And a learning experience.

FYE: I am sure you saw lots of problems that you had no idea what to do about. . .

LENFANT: Yes, that is right.

FYE: I mean, at the beginning.

LENFANT: That is right. Sometimes I would leave the consultation room and go and read the books!

FYE: Read the books, right. I have a funny slide about that I should show you some day.

LENFANT: Especially to prescribe things, that was very difficult.

FYE: Right.

LENFANT: But when you are 20-22 years old you learn quickly.

FYE: Surely. What a fascinating experience. So, when you were in the country practice, were you already married at that point?

LENFANT: Yes.

FYE: So your wife went with you?

LENFANT: No. She was staying in Paris. I have to say again, I really do not know if it is important or not, but that situation was pretty difficult--I would say from the very outset--but [it] became difficult very quickly. Of course, there was an issue of ego. I could never admit that because my parents would have had such a great time.

FYE: I see, so "everything's fine."

LENFANT: I did not see them but, of course, they would have known because there were so many people in between who . . .

FYE: Some network would have gotten the information to them.

LENFANT: Yes. That is right.

FYE: That is very interesting. So here we are in 1956...

LENFANT: You know it is very interesting. I divorced that lady in 1971, something like that, and it happened exactly in the same way that I moved away from my parents. It was so amazing, I said, "Boy, life repeats itself." My parents said [to me], "You

do it our way or you have got to go.” I looked at them and I said, “Fine,” and I left and that was it. And when I divorced in Seattle things were very, very difficult especially with the children and all of that. I can still see myself on the staircase going to the basement and my wife was on the first floor, leaning over the railing, and she said, “You know why don’t we divorce?” And I said, “Fine.” I went up, packed up my suitcase and that was the end.

FYE: My goodness, and off you went.

LENFANT: That is the way I made decisions.

FYE: After this is over, I will have to tell you about some recent decisions I made. I think we are kindred spirits. Mine did not have to do with family but professionally. Did your wife then go back to France with your children?

LENFANT: No, she is still here.

FYE: I see, okay.

LENFANT: Again, it is interesting, that three or four years after we divorced, maybe less than that actually, I heard that she remarried with a fellow who was 15 years younger than I was, and I said, “Boy, what is it that I am missing?” I was very impressed by that.

FYE: Yes, that would get your attention.

LENFANT: That marriage did not last very long either.

FYE: But your children have stayed in the United States?

LENFANT: Yes, they are all here.

FYE: Because they grew up here basically.

LENFANT: Oh, yes.

FYE: For all practical purposes. Now, again, tell me more about the dynamics. How much time did it take you to put your thesis together? It is such a substantial piece of work based on original research in an extraordinarily dynamic field.

LENFANT: About three years. You got three years, at least three years of experiments. Yes, at least that.

FYE: At the beginning, if you started, let us say, in 1953, you could have had no concept of where this field was going to be three years later because it was changing so rapidly.

LENFANT: No, absolutely, and many questions developed as we moved along. It looks a little like, and I think it actually is, a disparate collection of experiments, but they were necessary because as the field was moving questions came up and we had to try to find an answer. They were important questions of blood flow, of oxygenation, and of clotting. I must admit I do not quite remember what is in the thesis, but I think it was a dynamic time.

FYE: How much of the work that is in your thesis reflects adapting things that you saw and learned, let us say, from [Walter] Lillihei and [Richard A.] DeWall, which, of course, is the title?

LENFANT: The whole thing was based on an adaptation of that, but there were lots of derivatives that came from that. Certainly, I think, there is more on the biology than Lillihei and DeWall ever learned.

FYE: And that is basically because you felt that you were evolving into a researcher.

LENFANT: Yes.

FYE: Lillihei surely was a surgeon who was tremendously innovative and understood the need for this and had a lot of talented people around him, but, correct me if I am wrong, probably never viewed himself as a basic researcher.

LENFANT: No, he was not. You see what all his interns were . . . The other man [who] was very well known there was an English fellow by the name of Varco,

FYE: Yes. Richard Varco.

LENFANT: That is right. It was Lillihei, Varco, and then DeWall was one of the fellows or residents. At that time the department of surgery of the University of Minnesota had a very close association with the department of physiology, the chief of which was [Owen] Wangensteen.

FYE: Wangensteen was surgery, but Visscher was physiology. Maurice Visscher.

LENFANT: Visscher, yes.

FYE: Right?

LENFANT: Yes, Wangensteen was the head of surgery, and Visscher was the head of physiology. So there was that connection and all the residents in surgery under Wangensteen had to spend some time with Visscher.

FYE: It was a fertile environment.

LENFANT: Right.

FYE: In some respects [it was] similar to the cardiovascular institute where you were working in that you were the physiological piece, as you evolved, with surgeons and a very active clinical thing going on. What did the other institutions in France think about this? What did the other cardiovascular surgeons think?

LENFANT: There was lots of envy. In a way, I do not want to feel paranoid about it, but I have always wondered if that had not been a handicap for me, too, because at my age then—with my origins and all that—I should not have been in the limelight as I was, if you will.

FYE: But you were 27 or at most 28 when this thesis came out?

LENFANT: Sure.

FYE: So you were a very young person, particularly in a society like French society where I think that seniority is a critical determinant of your image and of what you can do. I suspect it did shake people up that this young person had done so much and was so much at the forefront of this.

LENFANT: Yes. Right now there is a surgeon who is actually retired but until a few years ago he was one of the really big names in France, a little bit like Carpentier, his name is Cabrol. I do not know if you ever heard that name.

FYE: How is that spelled?

LENFANT: C-A-B-R-O-L. He, too, actually is a fellow who pretty much developed himself in our laboratory there. So it is interesting that all these guys, Cabrol, Carpentier, others from France, they were on the right track to become established academic surgeons, but they succeeded, in part, because they went to this place that was not in their institution to see what was going on.

FYE: I imagine that was a twofold advantage for them, not only did they learn concrete things when they went there, but they went back having been there.

LENFANT: That is right. Many of these people were a little bit in the shadow of Dubost. I mean, Dubost was really a big name, and it was well deserved, I would say.

FYE: So, was it tremendously exciting to be there or was it sort of exciting?

LENFANT: Oh yes, and no.

FYE: What was the atmosphere or the ambiance?

LENFANT: It was a vibrant time and environment. There were always things which were happening. Something would come up during a case and while the case would be finished by 2 o'clock in the afternoon, having begun at 8 in the morning or something like that, then we would go to the lab and try to reproduce it and understand what happened. It was a very dynamic time, a very exciting time.

FYE: Let me just ask you again, the Lillihei-DeWall oxygenator, was it Dubost who recognized that and brought it over [to France] and put it in your hospital and then got you to working on it?

LENFANT: Yes.

FYE: That was the dynamics of it?

LENFANT: Yes, I think that is how it happened. Or maybe actually Dubost invited DeWall to come to France. I think that is what happened.

FYE: Now in terms of some research I did on chronology. John Gibbon (Jr.), in 1953, performed the first successful open heart surgery procedure using a heart-lung machine, and he closed an atrial septal defect.

LENFANT: Gibbons was a man from...

FYE: Jefferson in Philadelphia.

LENFANT: Philadelphia, yes.

FYE: John Gibbon, Jr. closed an atrial septal defect in an 18-year-old girl with his heart-lung machine which he had been working on for more than 15 years.

LENFANT: Yes.

FYE: But then DeWall, working in Lillihei's laboratory, as you mentioned, at the University of Minnesota, his innovation was this disposable bubble oxygenator, and they began using that clinically in May of 1955 really just months before.

LENFANT: That is correct. They beat us to it. By then we had a system that we were working on which was a diffusion system and when that first paper appeared that was what got Dubost very exercised. From what it says here [referring to Dubost's introduction in his thesis] he probably came to this country to visit and then, after that, he sent me again to see what they were doing.

FYE: It is interesting if you think about right at this moment in history in the United States--if someone reads this transcript 50 years from now they will not know this--that Microsoft is enormous. It is the largest corporation in the world, and there is a finding of monopoly that is now just playing out. If you think of all of the trade secrets in that sort of business and also you think of the context that this cardiac research was going on in 1956, just a little more than 10 years after the second World War ended, and, of course, when we were talking, you did mention that someone from Germany came, probably several surgeons from Germany came, but, nevertheless, the ethics of medicine are such that there is this sharing of information and this comfort of sharing innovations, presumably to help patients.

LENFANT: Oh, yes.

FYE: Could you say something about that? Was there any ambivalence when Dubost or you went to Minnesota?

LENFANT: No, absolutely not. I mean, what was getting people over there and inviting them was really the object of all that. Again, that was the beginning of a new era in cardiology, the ability to treat all these blue babies and other congenital defects which, of course, was unthinkable before that. That brought lots of people, again this fellow from Germany came, there was a fellow from Utrecht or Leiden, I forgot which one it was, also a big name--his name was Baum, I think--who would come to our laboratory and to the hospital to see what was going on and another fellow from Belgium too. Then there was a British one, Melrose, who came.

FYE: What was the British man's name?

LENFANT: Melrose. He is the man who started the potassium injection to stop the heart.

FYE: Was he at Hammersmith in London or somewhere, I wonder?

LENFANT: I do not know. Probably Hammersmith, I would say.

FYE: But you were a magnet for people from Europe . . .

LENFANT: No, not me, but the group was.

FYE: . . . no, your laboratory and the hospital

LENFANT: No, the group was the magnet. That was the only place in Europe where those things were done, and even the Russians were coming actually. It is very interesting, this is obviously a side track here, but the head of cardiovascular surgery in Moscow in those days was a fellow by the name of Petrosky who incidentally later became the health minister under Brezhnev, or whoever, one of those fellows there.

FYE: It was Petrosky?

LENFANT: Yes.

FYE: P-E-T-R-O-S-K-Y(spells it)?

LENFANT: Yes, or something like that. The reason I mention that is because I knew him, of course, and I had met him again after I went back. When I was at NIH I went to Russia and, at that time, he was the health minister. He was succeeded by another fellow whom I knew very well, who was a pulmonologist from Leningrad, and then eventually that man from Leningrad was succeeded by Chazov, whom I also knew very well, so it was quite interesting.

FYE: Chazov was the man that did the thrombolytic therapy and does not get credit for it.

LENFANT: Yes, I know that. Well, he is getting some from me as a matter of fact. I just wrote an introduction for something which is published actually by the American College of Cardiology and the American Society of Hematology there. They prepared an educational document on thrombolytic therapy and in my introduction I make the point that the first one was Chazov.

FYE: Right. I have made that point too. How is his name spelled?

LENFANT: C-H-A-Z-O-V. Eugene Chazov.

FYE: Yes. Of course, he was handicapped in the sense, I think, that there was only a very brief English abstract of his article.

LENFANT: That is right.

FYE: You know, having worked in America now for four decades, how pathetically unilingual this country is and for the overwhelming majority of American researchers now it is convenient that most of the literature of science and medicine is in English, but that was not true certainly in the 1950s or 1960s.

LENFANT: That is right.

FYE: There was much more literature published in the languages of the workers and there was much less interchange. But probably the greatest time was around the turn of the century when Americans--Osler and others, in fact--could read the European languages.

LENFANT: Yes.

FYE: There was a lot more interchange it seems to me in those eras with the international congresses that attracted people. The other question now is that Lillehei's group began using their oxygenator in 1955, and they reported their earliest results in 1956. They did the case, obviously, but I still think this was a much more substantial publication that came from your thesis out of the laboratory. But, at the same time, John Kirklin and the Mayo Clinic group--you mentioned that you visited there--were working with a different type of apparatus. I wonder what was your sense of the main differences between [the two groups].

LENFANT: I think that John Kirklin was a much better surgeon than the people in Minneapolis. He was a brilliant surgeon. It is funny, I cannot remember what device he was using, but it is correct that I do remember when I went to see them at St. Mary's Hospital that he had that operating suite which was an auditorium. We were sitting on the upper [tier]. . .

FYE: Right, I can picture those things.

LENFANT: He was quite remarkable.

FYE: I have a quote from Lillihei in 1993. He wrote an article, actually a number of articles, describing the early work in open heart surgery, and he said that the

DeWall-Lillihei bubble oxygenator was an instant success wherever it was tried because it had so many practical advantages. Here is what he said, “It was efficient, inexpensive, heat sterilizable, easy to assemble and check, and it had no moving parts.”

LENFANT: That is correct.

FYE: And apparently the Kirklin model was more complicated . . .

LENFANT: Yes.

FYE: ...and so perhaps . . .

LENFANT: I must admit I do not remember that, but all these qualifiers for the Lillihei-DeWall device are correct. It was really very easy [to use]. One thing, of course, that we did not have in France was the quality of plastic that existed in this country. I do remember that when we started bringing the Lillihei-DeWall model in our practice we had to import the plastic as well.

FYE: I would speculate again that maybe that had something to do with the research related to defense. I would not be surprised if a lot of those very innovations and inventions that you would never imagine--various types of plastic and rubber and also other things--were probably driven to some extent by defense needs and the like. It is speculation.

LENFANT: It is very possible. There is no question, in my view, that the greatness of this country in biomedical research, spanning from molecular biology to all that kind of stuff, is that America capitalized rightaway on all the research effort that was done during the war for war purposes. I think elsewhere, in Germany, for example, the level of research went down and the same thing [happened] in Japan.

Here it was transplanted from the war effort to civilian life, if you want, and academics. I think that has been one of the greatest moves that this country made actually.

FYE: It reminds of Vannevar Bush's book, Science: The Endless Frontier, after Franklin Roosevelt charged him to develop this policy of how to do exactly what you said, how to transfer this enormous research enterprise that had been developed in the United States as a result of the war effort to somehow maintain that momentum. Of course, in Japan and Germany, their economies were devastated and had no capacity [to develop] even if they had had the will or the intent. But I think it reminds all of us as we look at careers or countries that there are a whole lot of circumstances that have to come together to either create successes or [make for] lost opportunities. I think, in the United States in that era, it could have been very different. The federal government could have said the war is over, we do not need to support these research enterprises anymore, we are going to do something else with the money. I would suspect there was a very powerful—in fact, I know this-- lobby of researchers after the war who had seen what was possible and then they kept going.

LENFANT: You know that Shannon, of course,...

FYE: James Shannon at the NIH?

LENFANT: ...was very, very instrumental in all that. He is the one who built the lobby bringing all these young people to NIH, making them develop, and becoming a real force in that process. That was amazing. History, I think, will give much credit to that.

FYE: Fascinating time, though, and again your career has paralleled that perfectly, and we are only a little way into [discussing] it. Let me just ask you a few other questions. In terms of the DeWall-Lillihei apparatus, tell me what was the difference, what were the innovations in your apparatus?

LENFANT: Just that it was easy to put together, very simple, and it worked. Basically what you were doing was to put in oxygen, you were shaking it together, not shaking it [exactly] but you were bubbling the oxygen through the blood, and it worked. At the end of that you had blood which had an oxygen saturation of 95 to 100 percent. All the other systems to achieve the same result were enormous. There it was very simple. Basically, just for you to think, in say one minute if you could calculate the surface area of all the bubbles that went through the blood and say, "O.K. let's do it as a flat surface in order to achieve the same thing," you would need something as big as this room. That was the basic issue.

FYE: It is a volume, a physics and a physiological thing, biophysics, all these things came together, but the apparatus turned out to be rather simple.

LENFANT: Yes. And the trick, I think, was that they had mastered it without creating a gigantic clotting problem or conversely a bleeding problem and also with minimal hemolysis, which was a real problem. At the very beginning of open heart surgery, one of the complications of the Lillihei-DeWall, as I recall, was that if the surgery was going on too long then there would be a significant amount of hemolysis--I think there is a chapter in there [his thesis] on that actually--and that conversely may have led to kidney complications and things of that sort.

FYE: Because certainly mortality rates were still very high in these early years. I mean, they could not anticipate those complications, so as the kids started dying of kidney failure, then, obviously, they started exploring what the problem was. Is that fair to say?

LENFANT: Yes. And then pulmonary complications and all kinds of things.

FYE: Now, you mentioned that these were basically congenital heart patients and they certainly were. Was there much anticipation that acquired valvular disease, and I suspect coronary disease--there was not anyone that was really thinking about it--but was there any anticipation or expectation that these oxygenators could be used not just to deal with little kids and congenital hearts.

LENFANT: Definitely. Because in those days mitral commissurotomies were done with a . . .

FYE: Closed finger.

LENFANT: Yes. You put your finger in and using a fingernail you would carve things out just like what you were doing in prostate surgery in the same time,

FYE: I am sorry?

LENFANT: Prostate surgery.

FYE: Oh, prostate surgery.

LENFANT: That is how it was done, you were using your finger and taking out the prostate through the bladder with your fingernail. That was your tool, the fingernail.

FYE: So you could identify a tailor and a prostate surgeon by the length of their fingernails!

LENFANT: And, everybody recognized in those days that that could not continue because of the risk of infection. It was blind surgery, and, of course, there were lots of complications with this mitral valve...

FYE: Interestingly enough, and I have not reviewed this in preparation for our chatting today, but if I am not mistaken, it was not just Elliott Cutler in Boston in the 1920s that did the commissurotomies but there was a French surgeon named Truffier or Tuffier.

LENFANT: Yes, I think it is Tuffier.

FYE: Who was also a great pioneer of that but tragically the overwhelming majority of those patients died in the 1920s, so the whole thing was put on the shelf for 40 years. So you did have a sense that this was going to expand the horizons of surgeons and enable it to help lots of different types of patients.

LENFANT: That is really what happened during the first 10 years. Between the mid 1950s and mid 1960s there was a fantastic blossoming of these approaches. More importantly, you see, not only the methodology improved but in terms of public health that led to multiplying the number of people who were able to do that surgery because it was such a fascinating thing to do. I mean, if you wanted to be anyone you wanted to be a cardiac surgeon, and that really opened up the field.

FYE: Right. I want to go on now. You mentioned earlier Herman Rahn with whom you studied in Buffalo and you got there largely because of Wallace Fenn.

LENFANT: Yes.

FYE: It is interesting if you look at the record . . .

LENFANT: It was mostly because of Herman Rahn because he left Wallace Fenn.

FYE: He left him?

LENFANT: Yes.

FYE: But the way you found out about it was through Fenn, was that right?

LENFANT: Yes.

FYE: That was the connection. And then you worked in Rahn's laboratory?

LENFANT: Yes.

FYE: The thing that is curious is if you look at Rahn's sort of biographical sketches...
Again, I am just trying to clarify Rahn's identity from your perspective.

LENFANT: No, I think wherever you found that description of his work it is . . .

FYE: They did not know him?

LENFANT: ... not correct. I mean, if we are talking about the same person.

FYE: Yes, this man was born in 1912, would that be about right?

LENFANT: Yes, that would be.

FYE: It is probably the same person.

LENFANT: Yes. Herman Rahn. His parents were from Germany, and he was himself quite German actually in his approach to things. Now, what really made him famous was to develop the concept of the ventilation-perfusion ratio. All the ventilation-perfusion scans which are done today for the diagnosis of pulmonary embolism, that was him. His work has been on gas exchange and the homogeneity of the lung. He has done lots of work on pressure breathing, basically all of his work is at the basis of C-PAP as we know it, and artificial ventilation. He has, of course, done lots of work on the impact of G forces. That was a follow-up, if you want, of the work that he had done during the war when he was with Fenn, but what he

did during the last maybe 20 years of his life was he became very interested in comparative respiratory physiology. For example, he did lots of work on diffusion of oxygen through the eggshell. In fact, it is because of him that I became myself very interested in comparative physiology.

FYE: I noticed many of your publications deal with physiology of respiration in different species.

LENFANT: Yes, sure.

FYE: It is a fascinating sort of parallel career, if you will. I mean, it is very complementary but clearly distinct from the rest of your work. And he was the stimulus for getting you involved in that?

LENFANT: Oh, yes. He was the one who started that. But when I was at the University of Washington, in fact, it is very interesting, I attended the meeting of the American Physiological Society in Miami. The meeting was a real bore actually, so boring that I decided to go on a boat excursion and on the boat was a fellow who was also from the University of Washington whom I had never met before but he was from the Department of Zoology. We talked and we really hit it right. From then on, he and I worked together for ten years actually in comparative physiology. So he would bring his knowledge of zoology, and I would bring my knowledge of cardiorespiratory physiology, and we published extensively together. His name was Kjell Johanssen. He is dead now. He died from a heart attack actually somewhere.

FYE: But it was before you went to Washington that you met him? You were still at Buffalo when you met him?

LENFANT: No, I was at the University of Washington in Seattle, and I went to that congress of the American Physiological Society meeting in Miami and ended up on that boat. I can still see that. We had one of these boats just for five people and we were both sitting in our swimsuits on the front of the boat and we ended up sunburned, it was terrible. He was so even more than me because he was from Norway and he had the fair complexion of a Norwegian.

FYE: But once again, what a coincidence, because you just happened to meet that man on that boat.

LENFANT: And he and I traveled all over the world actually, to the North Pole, the South Pole, up and down the Amazon River, and around the Philippines.

FYE: This is one of the things that fascinates me as a historian because there is this over-simplification that in history and careers everything is a logical progression and things just inevitably happen.

LENFANT: Not for me!

FYE: All along the way choices were made, you were presented with options and opportunities and you chose which path to go down. Obviously, there is no way to know what your life would have been like if you had gone down another path, but what a fascinating story even to this point. And we have just scratched the surface of your career.

LENFANT: It was like my going to NIH. That was almost an accident.

FYE: We will get to that, but I do not want to go too fast forward here. I do not want to go too fast but, once again, to look at your CV, for example, there are certain threads that run through it in the 1950s and early 1960s. It is, however, only by

you telling me this coincidence that it explains how you got involved in comparative physiology in all these different species. It is absolutely fascinating. Now obviously Dubost was very enthusiastic and supportive of your coming to the United States and touring those places and I assume he was supportive of you going to work in Fenn's laboratory.

LENFANT: Yes. In fact, when I came back, he felt terrible that I could not find an academic position in Paris and that I had to go to Lille. I would say that it was the beginning of a drift, if you want, from one another, but I was no longer in his eyesights all day long because I was in Lille, and also, I think, by then the head in the Hôpital Broussais was retiring and so Dubost was moving his whole enterprise back to that hospital.

FYE: The man that retired again is this d'Alaines?

LENFANT: Yes.

FYE: And the Hospital Broussais was it a university hospital?

LENFANT: Yes, it was a university hospital. I mean, in those days, it was not a university hospital. It was a hospital of the Assistance Public, which is a network of all the hospitals in Paris for public assistance, and the university used all these hospitals for clinical teaching. Everybody, all the heads of the departments, were professors at the university. In those days, there was only one university in Paris.

FYE: The University of Paris. So everyone that had faculty appointments in medicine in Paris was on the faculty of the University of Paris.

LENFANT: Yes.

FYE: But they used, presumably, dozens of hospitals . . .

LENFANT: Yes, dozens of them.

FYE: . . . spread out throughout the entire area. Well, briefly, as I think we will end this interview around 12 and let you go, we are coming to a close but just to fill in some of the gaps. You mentioned earlier that you worked in Andre Cournand's laboratory at Bellevue and that was in 1959.

LENFANT: And a bit of 1960.

FYE: So you were basically 30, 31, 32.

LENFANT: That is right.

FYE: He was 63 and it was just two years after he had won the Nobel prize, but your impression was that he was frankly always difficult and that that did not change him because of the notoriety.

LENFANT: Yes, he was really impossible.

FYE: It made no difference that you were from France?

LENFANT: No. Let me tell you something else. You see when I left his department to go back to France for a few months, it never crossed my mind that I would come back to this country. That was not the plan. The plan for me was to get myself together and do something in France. I had been having a good time, it was time for me [to go back], and that was why I accepted this academic position there.

FYE: In Lille?

LENFANT: In Lille. But a few months later I was back in Seattle, and Cournand stopped talking to me for years. He could not understand that, "How dare you come to this country?"

FYE: Something he himself had done and yet.

LENFANT: Later on, in 1975 or something like that, 15 years after I had come to this country, when he came to see me at NIH, he said that, "Maybe it was not a bad decision after all."

FYE: Isn't that fascinating? I do not know how he could come to any other conclusion at that point, but that was really remarkable.

LENFANT: But, between 1960 when I came back and 1975 or 1976 whatever--let me see, yes, I was not yet the director of the Institute when he came to see me--anyway, if I would see him at a clinical meeting, for example, he would turn his back and not want to talk to me.

FYE: How peculiar.

LENFANT: Oh yes.

FYE: But when you worked in his laboratory you did not sense any greater tension [between you] than there was between anyone else with Cournand?

LENFANT: No, he was obnoxious with everybody.

FYE: With everyone.

LENFANT: The only person with whom he was not obnoxious, in fact, there were two of them. There was a fellow by the name of Gomez, who had come from Cuba, and another one, a very well-known man by the name of Ewald Weibel who is from Bern, and those two were really different.

FYE: Somehow he connected and clicked with them but with virtually no one else?

LENFANT: Yes. I think the reason was that those two were teaching him something that he did not know, whereas all of us we were learning something.

FYE: That is interesting. Was he willing to teach and share though?

LENFANT: Oh, yes. He was, but first he had to establish that you were some kind of an idiot and then...

FYE: Put you in your place.

LENFANT: Yes.

FYE: That is fascinating. I collect historical offprints, and I have a great big collection. I have done this for 25 years, and I wrote to Cournand, I think it must have been in 1975 and asked him for a selection of his publications. He sent me a monograph that he had written on the history of cardiac catheterization, and it said "To my colleague, W. Bruce Fye from André Cournand." I was thinking how ironic this was because once again--these things are all going somewhere eventually-- if 100 years from now somebody looks at this and says, "Did Fye ever work with Cournard, it says his colleague . . ." "It is one of these interesting things where you can be misled by things and only by conversations like this do you really get an insight into the dynamics. So were you left pretty much alone when you were working in his laboratory or was there a fair amount of supervision or how did that work?"

LENFANT: Yes, there were people who were supervising us, I mean who were the most senior in the department. There was a fellow by the name of . . . I think it was Henry Bristow, who was from England, had come to this country and was one of the associates of Cournand. There was another person whom you may know. The name may mean something to you, Harry Fritz

FYE: Fritz?

LENFANT: F-R-I-T-Z.

FYE: No, I do not know that name.

LENFANT: Harry Fritz became the chief of medicine eventually at [SUNY] Stonybrook.
There was of course Irene Ferrer, you don't know that name?

FYE: Ferrer?

LENFANT: Ferrer, yes. The sister of the movie actor, she was the chief of cardiology at
Columbia University.

FYE: Oh yes, I know her. I had no idea she was the sister of an actor.

LENFANT: Yes, a very famous actor. And then there was Lillian Harvey.

FYE: Harvey.

LENFANT: Yes. So these were all the people who were there and trying to buffer us against
Cournand.

FYE: What was the focus of your research there? Again were you working on your own
projects in part or was it primarily doing things that . . .

LENFANT: No. I was really working on the clinical application of what I had learned in
Buffalo. Ventilation-perfusion and gas exchange and pulmonary circulation. I
worked extensively on pulmonary circulation.

FYE: Of course, Cournand was fundamentally a pulmonary physiologist if I were to . . .

LENFANT: Yes.

FYE: Early in his career certainly.

LENFANT: Yes.

FYE: And cardiac catheterization came into play because of his interest in pulmonary
gas exchange and cardiac output.

LENFANT: Well, keep one thing in mind. No, Cournand trained as a cardiologist, I think he trained as a cardiologist.

FYE: Ah ha.

LENFANT: But keep one thing in mind. In those days pulmonary was not a discipline except for tuberculosis.

FYE: Right.

LENFANT: So therefore any cardiologist was a pulmonologist at the same time.

FYE: So when you were working in Cournand's laboratory, what was the focus of research in the laboratory?

LENFANT: It was all on the control of pulmonary circulation. Nobody was talking about working on the systemic circulation. That was almost taboo.

FYE: But, of course, his advances or his contributions to cardiac catheterization really drove the growth of cardiac surgery and then of cardiology, but was most of this fairly basic research when you were there in the laboratory?

LENFANT: No, it was clinical researches, in those days, which were very much at the forefront but it was doing five cases here, five cases there, and then not as we do it today.

FYE: No. It was quite different, wasn't it? The magnitude was different.

LENFANT: Yes.

FYE: I think we should probably close [for this interview]. It is hard to go much beyond this in terms of our ability to keep framing and responding to questions, but I think it has been phenomenal.

LENFANT: Okay.