

This is an interview of Dr. James Pittman, Distinguished Professor at the Center for Advanced Medical Studies, University of Alabama at Birmingham, taken as part of the Marshall Nirenberg Collection for the National Library of Medicine and the National Institutes of Health Historical Office, on December 13, 1995. The interviewer is Dr. Ruth Harris.

Harris: Dr. Pittman, I'm going to let you start out and tell me about your first early encounters in meeting with Dr. Marshall Nirenberg as a boyhood friend.

Pittman: I have been trying to figure out exactly when it was, and I think it was the winter or early spring of 1943-44 (spring '44), when Marshall and I were both 16 years old and were in the second year of Orlando High School (eleventh grade). He was born on April 10th, 1927, in New York City (and I two days later in Orlando); but his family moved to Florida when Marshall was a child because he had an illness diagnosed as rheumatic fever, and they wanted to avoid a recurrence, which they were told would be less likely in the milder Florida climate. There was no penicillin then; so another streptococcus infection could have triggered another attack of rheumatic fever with resulting damage to the heart valves, etc.

I did not know him during childhood. The first time we met was at the Orlando High School in the winter or spring of 1943-44. The school was then called "OHS" by the students and now is one of several high schools in Orlando; it is the one now called "Boone High School." It was the high school for white kids; the only other high school in Orlando at the time was

on the west side of town for black children. These high schools covered the 10th, 11th, and 12th grades. Mr. Boone--I do not remember his first name--was the principal of the school when we were.

During the war, the Army Air Force had a big base in Orlando for training pilots. There was no Air Force in those days, only the Army Air Force and the Naval Air Corps; the U.S. Air Force was established as a separate service in 1947. At this army air base was a unit with a group of scientists called "The Arctic, Desert, Tropic Branch (ADT)." It was staffed by a number of biologists, I don't know how many--maybe a dozen, and perhaps other staff. Their job was to write pamphlets for the aviators about how to survive if you were shot down over the Arctic, the desert, or the tropics. One of their activities was to sponsor luncheons at which the only things served were plants or animals which could be obtained locally from the wilds of the swamps or beaches. We had one lunch where they served alligator steak, rattlesnake meat, raccoon, 'possum, sea purslane, hearts of cabbage palms, and all sorts of other local wild plants.

Harris: You and Marshall went to this?

Pittman: I don't know whether or not Marshall went to that luncheon; I don't remember his being there, and that's the only one I attended--probably invited by one of our ornithology friends in--the Arctic, Desert, Tropic Branch. In fact, it was probably B.Frank McCamey, the one who really got us started in biology. He was a young zoologist in the ADT Branch who

came to OHS and gave a lecture on birds. He showed a film about bird migration and other aspects of ornithology. At the end of the film several of us went down to the front of the room to talk and ask further questions; Marshall was one and I was the other--we may have been the only two; I don't remember. But McCamey was a nice fellow and invited us to go with him on some bird expeditions--looking around for interesting local birds. Of course, these fellows were professional biologists, ornithologists, and they were excellent biologists. Frank McCamey later taught at several universities, especially Connecticut and then went into forestry and wildlife management. The other main one was George M. Sutton, Ph.D., who was one of the great ornithologists of this century and who finished his career at the University of Oklahoma in Norman. Sutton taught us how to prepare bird skins for museums although maybe Marshall knew before that; I'm not sure. Probably Sutton taught him. Marshall and Sutton taught me, I know. Roger Tory Peterson of the "Peterson Field Guides" fame was also there. He was part of the ADT Branch. You have heard of him, I guess?

Harris: Oh yes. I have some of his books.

Pittman: Well, they were real professional ornithologists--and we would get up early and go out and put up mist nets, these little fine nets for catching birds alive, and we'd string them across a swamp, a long, narrow swamp. Then we would go to one end of the swamp and form a line of people and beat the bushes and walk through it and drive the birds into the mist net. They would

get caught there, and we would take them out and weigh and band them and release them. We learned a lot about bird identification and how to skin birds, make study skins, etc. I think Marshall may have done more taxidermy, such as mounting birds. Marshall and I also used to go hunting. I do not know how many times we went--perhaps a dozen. We went over to the St. John's river marshes or to the Indian River adjacent to Cape Canaveral, where the Kennedy Space Center is now.

I remember very vividly one sunny afternoon when there were three of us in a flat-bottomed boat in the reeds and sawgrass at the edge of a shallow slough in the St. John's River. Marshall was one, I was another, and the third was a local barber from Orlando, Hezzie Long. It was a perfect day, chilly but not too cold; bright sun; a breeze from our left, so that the ducks had to land from our right to left, providing a textbook target. We got thirty ducks that day, the legal limit, including a pair of wood ducks. I still have the male in the attic--well mounted, but in rather bad shape now 52 years later, losing feathers, etc. The romantic memory of an old man, now.

Sometimes we would go early on a week-end morning for one day's hunting. At other times we camped out and stayed several days. At night camping in a cluster of Australian pines, we would sleep to the singing of the wind in the trees. We would wake up before dawn in the winter and hear the eagles (bald eagles) calling. There were huge numbers of ducks, cormorants, terns, herons, roseate spoonbills, and things like that. The environment was

really beautiful then, and to my mind those were wonderful experiences; and they formed our outlooks and philosophies in an ideal fashion. At least they formed mine; you'll have to ask Marshall just how important they were for him. Perhaps those experiences did help awaken a sort of appreciation for biological science then. For example, at the end of a day searching for birds, we would fill out our list and try to give an honest estimate of the numbers of individuals we had seen for each species.

(Dr. Pittman describes next the site of a photograph taken in the 1940s of Marshall Nirenberg.) This was on an island in the Indian River adjacent to Merrit Island where Cape Canaveral and the Kennedy Space Center are now. The east coast of Florida at that point is really made up of spits of land, sort of big sand bars, and Merrit Island is one of these. Indian River is really an estuary of the sea and fairly shallow. One could wade out into that water, about waist deep, to a small mangrove island about two acres in size. We called it "Pelican Island," and I think it is still called that. It was filled with the nests of all sorts of birds, but especially brown pelicans. It is now a bird preserve, and today it is illegal to visit it without a permit. Probably the visits by Marshall and me were responsible for the unwitting destruction of some young birds, even though we tried to be careful. It was on this island that the photograph was taken.

The other photo of Marshall, which I think I sent, shows him holding a very large dark snake. That was an indigo snake we caught beside the road

between Orlando and the east coast one afternoon. It was a very docile snake, kept by some of the local natives under the house to catch rats and mice. I kept it in a cage for about a month, but it never would eat, so we finally just released it. Marshall knew all about such snakes, as he immediately studied any such find very diligently and thoroughly. I remember how he told me about the docility and utility of the snake shortly after we caught it.

Harris: You mean one of the photographs that you sent?

Pittman: Yes. That would have been sometime during 1944, probably the spring or early summer, in view of the many species of nesting birds. Sometimes there would be stingrays on the bottom; so we took long sticks and poked the bottom ahead of where we were walking to frighten the stingrays away. It was perhaps a quarter-mile from the shore out to the island. When you got out there, there were these low mangrove trees; you can see in the photograph. The pelicans nested in these. Then there would be sections of the island where there were lots of cormorant nests with their big blue eggs, and other areas with nests of American egrets or snowy egrets, and on the ground were black-necked stilts--tall birds with a white belly, black back, and pinkish legs. These would run around giving a "broken wing act" in an attempt to distract us away from the nest. Sometimes we saw other birds, such as the spectacular roseate spoonbills.

Harris: Would just the two of you would go on these trips?

Pittman: Usually, yes. Sometimes there would be a third, Hezzie Long, when we were hunting, or Ray Nicholson, a local ornithologist. But usually just the two of us went.

Harris: Did you get to know his parents and sister?

Pittman: Oh sure. I did not know his sister. I guess I may have met her a couple of times, but I did not really know her. She is in Mississippi?

Harris: She is in Texas now.

Pittman: Texas. Yes.

Harris: What were his parents like?

Pittman: His father ran a dairy farm that Marshall grew up on, and they were nice people. I ate at their house a number of times, and Marshall came to my house. His father was a quiet man. He was a good businessman. Marshall was very intense in his work, and Marshall's mother died at the NIH, you know.

Harris: Yes. I knew that.

Pittman: She had adrenal carcinoma, I think. I think that she died after I had left the NIH because I went back there several times and saw her while she was in there. She was getting a new experimental drug that did not do much good.

Harris: Who died first?

Pittman: She did.

Harris: She died first?

Pittman: Yes. I think that is right, and I think that Marshall's father was just very lonesome. This is speculation. But I never said anything much about it. Marshall said that his father had once told him several times, "Don't worry about the job. Medicine is just a job. You have to get up in the morning, go to work, go back home at night, and study, just like any other job."

Perhaps the dairy farm also guided Marshall toward nature study and biology. The dairy would of course be populated with birds that like that environment, like cowbirds, grackles, and redwinged blackbirds. I meant to tell you about the tremendous amount of noise in the pelican colony -- a lot of noise and activity.

Harris: You mean by the birds?

Pittman: Yes. You would go walking along through those mangrove trees, and all the birds would be squealing and squawking. The birds overhead would be shrieking and attacking you a little bit by dive-bombing you; and the the pelicans would vomit big fish out in front of you.

Harris: Oh.

Pittman: I have some old 16mm movies of these expeditions, mostly of Marshall examining the nests there and along the edges of causeways, which were fairly deserted in those days, big stretches of beach. The photos were made from these movies. I imagine most of that sort of land is gone now and that the tern nests are much reduced in number and extent.

My father admired Mr. Nirenberg. My father ran a lumber business there, building supplies, and I remember that when Mr. Nirenberg died, my father commented that he was a good, honest businessman, always paid his bills promptly.

Marshall's mother was a very soft, nice lady--just a bright pleasant considerate lady. I don't remember anything specific about her, except that she was the same at the NIH when she was so desperately sick.

I was trying to remember things for this interview, and it's funny what you remember. I guess Jewish people were more segregated or something in those days, but it never struck me much that Marshall was any different from anybody else. I remember wandering into a couple of parties he had or was attending, and people would tell me about how it is to be a Jew and everything as if I were Jewish. But one time when he was at the University of Florida, I had been accepted to medical school in Boston. It must have been late spring or early fall 1948. In fact, I may have stopped by on my way north to attend medical school the fall of '48. He belonged to Pi Lambda Phi--was that it?

Harris: Yes.

Pittman: Yes. He was in that fraternity, and I stayed there one night on a trip somewhere. They were having a party that evening, and this guy got me off in a corner and said, "You think you have seen antisemitism; but wait until you get to Boston, and you will just have all kinds of problems." He went

on and on, and finally I said, "Look, I am Presbyterian; I don't think I will have any problems." But it was funny. But it was funny.

Harris: Where did you go? You did not go to the University of Florida?

Pittman: I went to a Presbyterian college in North Carolina named Davidson. I was going to be a Presbyterian preacher, and that did not seem to interfere with anything. The guy who sent me to medical school was my Sunday School teacher because I majored in biology and loved reading about it. I wrote a paper on evolution, and I remember going to Sunday School one day, and a kindly old gentleman with a big shock of gray hair and bright blue eyes looked at me in horror and said, "You believe in evolution! You are going straight to hell!" And I thought, "I'll never make it in this business. I'd better be a doctor and/or a medical missionary."

Harris: Well, you were good friends in high school with Marshall. What happened when you went to different colleges? How did you keep in touch with one another?

Pittman: Oh, I do not know. We just saw each other once in a while, in Orlando for the most part, I think. Anyhow, in 1948 or '49 he went back to Orlando. You will have to get this from him. I do not have the times straight. I think he went back and worked on his father's farm, which was being converted to a candy business then. Later he returned to the University of Florida and earned a master's degree in biology for studies on Caddis flies. I noticed that his M.S. was actually in 1952. I would have thought it would have been

earlier than that. I didn't see much of him during that period, but I remember he was collecting Caddis flies. He described a few new species. I'll bet you he knows more about Caddis flies than anybody else at the NIH!

Harris: Well, he did work as a salesman after he graduated from the University of Florida. He worked as a candy salesman.

Pittman: For his father?

Harris: Yes. For his father, and then he went back to graduate school; so that's why you see the gap.

Pittman: It would be interesting to know what his grades were. I'll bet they were about average or a little over average.

Harris: What kind of student was he in high school, or do you recall?

Pittman: I do not recall anything special. He was probably okay. Just nothing special. I do not think he was in any big honorary societies. He was quiet. He has always been a very quiet guy. I think, for my money, he is one of the best biologists, or "THE" best biologist, I ever saw, and the most dedicated. I mean, he just loves that stuff.

There were three of us. There was another guy named James Boyles, and he became a biology teacher also. He was teaching in recent years at the University of South Alabama, I believe. I have lost track of him pretty much. But he was the reptile guy, and we collected snakes, a lot of snakes, too.

But ask him about Caddis flies. I believe he described several new species.

Harris: I did already because I had talked to you previously.

Pittman: Do you know how to catch Caddis flies?

Harris: No. How?

Pittman: You go out in the evening, and you string a wire between a couple of trees. You hang a sheet from the wire, and you hang a bright lantern behind the sheet, or on one side of the sheet. Then you put a trough, a sort of a metal trough, along the bottom of the sheet, and the Caddis flies fly into the sheet and fall down into the trough. You can get them out of the trough. I do not remember whether he had anything in the trough or not. But I went out with him several times doing that. As he explained it to me, you could tell the degree of purity or pollution of a stream by the kinds of Caddis fly larvae that lived in the stream because they make little stick houses and live in the water. I would put something about that in there because he was a good biologist.

The other thing that I was thinking about--there was a big marsh near his house on Highway 441 out near the Orlando Country Club, I believe. That thing had a lot of red-winged blackbird nests in it one spring, and we went out there and took some pictures. Mostly my pictures of Marshall are of his hands holding the bushes aside so we can get a picture of the nests. But

as we came out, a big truck, piled up with grapefruit, came past, and these kids in the top of the truck threw grapefruit at us.

Harris: Oh, my goodness.

Pittman: They were just mean and rowdy kids. I don't remember whether we got hit or not, but they splattered all over the place.

I remember hunting with Marshall one time, and I got a double which impressed him. I shot into a batch of ducks and got two at once.

But I guess the romanticism of the thing is what strikes me most, just camping out in the midst of all that natural history. Have you ever heard of an Australian pine? It is a big pine with sort of tubular needles, and the wind in those makes a wonderful sound.

Harris: Well, can you tell me about when he was to the National Institutes of Health and you had spoken for him at the University of Alabama? I asked him about the University of Alabama.

Pittman: Yes. What did he say?

Harris: It was my understanding that you had approached someone at the biochemistry department at the University of Alabama Medical College about a position for him.

Pittman: I did?

Harris: Yes.

Pittman: You see, I think you said in your letter to me that he had sought a position there. He did not seek a position here.

Harris: Can you please go into that and explain what happened?

Pittman: Well, he finished his Ph.D. in biochemistry at Michigan, didn't he?

Harris: Yes, he did.

Pittman: Yes, he finished it in '57.

Harris: Yes.

Pittman: In 1957 and 1958 he worked at the NIH; his postdoc was with DeWitt Stetten at the NIH.

Harris: That is correct.

Pittman: Stetten, who I think had gout, thought that the serum uric acid level paralleled somehow the intelligence of the person, and he went back in history. I do not remember who they all were who had gout--but there were Benjamin Franklin and others. He thought that the high uric acid might be related to intelligence, and he wanted Marshall to work on that. I do not remember what experiments he wanted Marshall to do. That was before the days of knock-out mice and that sort of thing, but as I recall, he wanted Marshall to somehow raise the uric acid of rats or mice and put them in mazes and see if they performed better. I do not know what that has to do with anything. Marshall could tell you more about what he wanted to do. But Marshall thought the whole thing was the dumbest thing he had ever heard of, and most people would agree with him; so he went off into studying what the next thing was, and I guess Stetten must have gotten mad at him or thought he was not any good because he fired him. He did not

actually fire him; he just didn't give him a second year of fellowship. They are usually a two-year postdoc or more.

And you know who might be able to tell you about that is Jan Wolff.

Do you know him?

Harris: No.

Pittman: He is over in Building 5, I believe, up there at the NIH.

Harris: Okay.

Pittman: But there might be somebody else around who could give you information, and he is right there at NIH. I would talk to him. He knew Marshall. He knows Marshall. There are probably other ones, but I don't think Ira Pasten would be one. I do not know who would be the best one to ask. In fact, I do not think Ira was around then. But Jim Field might. He is in Boston now. But anyhow, Marshall, as of the summer of '58 did not have a job. Yes, it must have been the summer of '58. I know that I came here from the NIH in 1956, and in 1956 to 1957 I was a resident. Then from 1957 to 1958 I was chief resident. In 1958 they hired me and gave me a lab which had a Ph.D. position, and it was a V.A. laboratory, funded from the V.A. research program. It had a Ph.D. position which the previous guy had left, and I had an empty slot. I knew Marshall had a sister. I thought that she was in Mississippi at the time, but maybe that is not right. She was down in this area somewhere; so I thought that maybe he would be interested in coming back south again, especially if he didn't have a job. I had him come down. I

do not think that there is any way I can check the exact time of that; but, at any rate, he came down and gave some talks.

It is interesting to me. I think there is a general principle here. He talked almost entirely about cyclic-AMP. Now cyclic-AMP, the messenger molecule, was only discovered in 1957, and this was 1958. People knew it was important, but it was not yet a fashionable topic; and they did not know or realize the full significance of cyclic-AMP at that time; but Marshall did. The general point is that, I think, to be a great researcher, you have to have a good nose, like a bird dog, to be able to identify the problem that is a significant problem and pursue that; and Marshall has certainly always had that.

But here it is only one year, maybe less than 12 months after the discovery of this molecule, and that is all Marshall talked about. Sure enough, in the next 10 years it was a big deal. A lot of research came out of that and, of course, Sutherland won a Nobel Prize for that. I think maybe Marshall's Ph.D. thesis may have discussed it. What was that on?

Harris: It was on ascites tumor cells.

Pittman: Ascites tumor cells. Right. He may have talked about that, too. I do not remember. I think he did work [on] glycogen metabolism in those because Warburg had just said that they were all out of aerobic metabolisms.. But I remember he talked a lot about cyclic-AMP. This is the part I don't know whether to tell you, but I will: I had the money and the space and everything,

and I went over to see the chief of biochemistry, the chairman of the department of biochemistry, whose name was Emmett B. Carmichael, and Emmett B. Carmichael was a noted antisemite around here. He really was.-- He is dead now.-- He spent a lot of time trying to prove that Goldberger didn't really discover the basis of pellagra, and the nutrition guy here, a fellow named Butterworth, who had no particular interest in the whole thing, just lambasted Carmichael for his ridiculous positions. Carmichael didn't seem to be a bad guy. He just was antisemitic, and I didn't know any of this stuff. I just had my lab over there. So I went to see Carmichael, and I said, "I'd like to give this fellow an assistant professor position in the department of biochemistry. He is a biochemist, and he won't come unless we give him some sort of academic position." I think he interviewed Marshall. I went back and talked to him again, and he said, "What did you say his name was?" I said, "Nirenberg."

He said, "That's a Jew name, isn't it?"

I said, "What are you looking for, religious leader or a biochemist? He's a good biochemist."

He said, and this is a fact-- what the guy said; he said, "Oh, it has nothing to do with religion to me. I'm a liberal as far as religion goes. I've got three secretaries out there. One of them is a Baptist, one is Presbyterian, and one of them is a Methodist."

That's exactly what he said. I think I've told Marshall that story since then, but I don't believe I told him then. I probably just told him that we were having trouble.

We went over to the dental school, and the dean of the dental school, a fellow named Joseph Volker, who really is the one who built this place and who came down here from Tufts, said, "Oh, we'll give him an appointment in the dental school." Somehow the atmosphere, I don't think, was quite right. Maybe word of that got out somehow, or maybe Marshall just did not want to come down here because what happened was that Gordon Tomkins gave him a job. Have you ever heard of Gordon Tomkins?

Harris: Yes. Marshall has described him.

Pittman: He was a great guy, and he died a tragic death because they did not do the darned operation right at Columbia P & S. But he gave him a place to work there, sort of hang out, and that was 1958. I must have been back at the NIH in the summer or spring of 1959.

Harris: Did you work at the NIH while Marshall Nirenberg was working here?

Pittman: No. I left. I was there from 1954 to 1956 and came here.

Harris: You just said that you came back here in 1959.

Pittman: Oh, I made trips up there just to visit. I was on a couple of committees, I guess. I do not think I was on any committees then. I do not know what I was doing back up there.

Harris: Was Dr. Volker in the dental school agreeable to hiring Marshall?

Pittman: Oh, yes. He was all ready to go. Volker later became vice president, and then president, and then chancellor of the whole system. Sure, this guy Carmichael was an aberration, I think. He was old. He started working in the department of biochemistry in 1927 in Tuscaloosa. But Tuscaloosa was a two-year school, and he moved up here in 1946. He was a dinosaur. But that's a true story.

Harris: Later after Marshall Nirenberg deciphered the first code word, did you have him down to speak at the University of Alabama?

Pittman: I had him down a couple times. I wanted to tell you one thing, though, about the summer of 1959 or so. I was up there. I knew Gordon Tomkins. I liked all these guys. We had been at his home in Boston and just in various ones. I saw Marshall, and I am pretty sure it was at the NIH because I think it was in his lab because some of my other friends like Jan Wolff, Stan Segal, and Jim Field and other people stayed up there and stuck around. So I saw them often. But I was in this lab, and Marshall was standing there; and I said, "Well, what are you going to do this summer, or next summer?" He said he was going to go to Cold Spring Harbor and take a course in genetics. I remember Gordon said, "If you can get in. They probably won't let a junior person like you in." He said that "oh," he thought he would get in. Well, he got in, and that was when he really went to work on the sequence and the code. But ask him about that course at Cold Spring Harbor and how much influence that had on him.

Harris: Yes. He has spoken about that.

Pittman: Was it important?

Harris: Yes it was, indeed.

Pittman: Yes. That was my impression. He's been here at least three times. There was a genetics symposium here, and it was before he won the Nobel Prize. I wanted to get him down, and we got him down to talk at that. It was the highlight of that symposium. But then we had him down to dedicate a new research building here, and that was the time I found this old skin of a western palm warbler, I think it was, that he had skinned in 1944 or thereabouts. I still had it. It was in the original little cardboard box, a shotgun shell box. I gave it to him, and before the audience as he held it up by one leg, the skin broke and the rest of it fell on the floor. But that is in a letter I sent up to the NIH.

Oh yes. Another thing I wanted to tell you was about this bird dog instinct of Marshall's for ferreting out--knowing--exactly what the problems were. It was about 1964 or 1965, and we had had supper, and he wanted to go home. I think maybe Wolff was with us. We wanted to go out somewhere, but Marshall did not want to go; he wanted to go back home and study. I asked him, "What's the next big problem?" This was after the triplet was found, and he had written some things about how the whole code was going to be known very shortly. He wrote an editorial in *Science*. Have you seen that one?

Harris: Yes. I have a copy of it.

Pittman: I think that's a good editorial. Anyway, I said, "Well, what's the next big question?" He said, "How you turn them on and off." Of all the biological questions today, it seems to me, they boil down to that, to gene expression, how gene expression is controlled, and that's what 90 percent of the work seems to me to be on: gene expression. Marshall said that; it must have been not later than 1964. So he knew; he just has an instinct for knowing where the big questions are.

But he came down in 1981 or 1983 to dedicate that new building. He stayed a short time. Oh, we had Phil Leder down, too. He was always very proud of Phil Leder. I guess Leder will never win the Nobel Prize now that Tonagawa won it. But we had Phil Leder down for Medical Student Research Day here, and it was the day after Marshall came down to dedicate this building. I mentioned to Marshall that he ought to stay over. He had already won the Nobel Prize and was, of course, world-famous by then, but I got him to introduce Phil Leder. I thought that was a nice touch.

Harris: Now, of course, you must know Marshall Nirenberg's wife?

Pittman: Perola.

Pittman: I've been at their house once or twice years ago.

Harris: Did you go to their wedding?

Pittman: I don't think so. No. I don't know. When were they married?

Harris: 1961.

Pittman: 1961? No, I didn't go to their wedding. I was here working very hard.

Harris: Did Marshall Nirenberg come to your wedding?

Pittman: No. I was married in Boston. It was a bunch of physicians. I don't know. It was a bunch of Boston people, residents and people like that.

Harris: Nowadays, how do you keep in touch with Marshall Nirenberg?

Pittman: Through people like you. I haven't seen him in a couple of years, I guess. We do not correspond a lot. Maybe he corresponds with somebody; he doesn't correspond with me. We do not have a lot to talk about except about what he is doing in science. The course of my life has been different. I had a lab in the 1960s and worked on the thyroid, and it was sort of semi-clinical. My view is that M.Ds. who see patients ought to work on something that has to do with patient care; and if you try to be a biochemist, you ought to quit trying to see patients. There are people like Joe Goldstein, who won the Nobel Prize, down in Texas; he still makes rounds. The kids love to make rounds with somebody smart enough to win a Nobel Prize and be a great cell biologist, but I would not want Joe taking care of me if I got a coronary. My view then was that I ought to do more clinical stuff, and so I did. I did some biochemistry, but it never amounted to anything. I worked on control of TSH secretion, hypothalamic hypothyroidism, human iodine intake, and that sort of thing. So the course of my career was different.

I moved back to Washington in 1971. I must have seen Marshall a bit then, I guess. From 1971 to 1973 I was head of the Research Program in

the V.A. Then I came back here as dean, and you do not do anything except sit in meetings and drink coffee, recruit faculty, and allocate space and money as dean. So I saw Marshall. That was when we got him down to dedicate the building.

Harris: A quick question about you and your career. Have you concentrated on research, or have you concentrated on taking care of patients?

Pittman: I have always seen patients. I love to see patients, and I still see patients. I saw a bunch of them yesterday morning. I am trying to cut back now. It is very difficult to do that a little bit. I try to see patients only on Tuesdays and Thursday mornings, but they get sick at other times, too; and they call you up; and if you are at all conscientious, you have got to answer. It takes a lot of time.

Harris: Do you teach?

Pittman: Yes. I teach. I had a lab from 1958 to 1971 or 1972. I guess I had one before that. But I did try to be a biochemist and joined a bunch of societies and things, but I think it is very difficult. If you do both, you tend not to do either very well. There are a few people who seem to be pretty good at both. Jim Wyngaarden is one example. But if you look at Jim Wyngaarden's career, he did not do both simultaneously. He sort of oscillated to concentrate on biochemistry, and then he would go back and do more patient care and then go back and do biochemistry. But there are very few people like that. Most people sort of fall into one or the other, or else they become

mediocre at both, and I think I am afraid that I fall into the last category--sort of mediocre in both of them but more emphasis on patient care. But it certainly has not been in the gene business. Marshall was in the lead of the gene business.

You know another person you might talk to that would be interesting is Dan Nathans over at Johns Hopkins. He discovered restriction endonucleases. Those are the enzymes that cut DNA at different spots so that you can make different lengths of DNA. It facilitates analyzing it and constructing different kinds of plasmids and DNAs. Dan had a peculiar story he told me one time. Dan was at the NIH in probably 1955 through 1957--I'm not sure exactly when. But Dan went back to Columbia in New York and was a resident and chief resident in medicine. He was a very good clinician. Then he went over to Rockefeller and dropped out of clinical medicine and became--and I think he probably still is--head of microbiology at Hopkins for many years. He is another interesting guy. Well, he was at the NIH and he is a Nobel Laureate. Why don't you do a whole series of Nobel Laureates who have been at NIH? That would be interesting. I'm just looking in a book to see if Dan Nathans is still head of microbiology. Well, he's not listed in the last book here. He is probably retired from that. But he was for a long time head of microbiology there, and he discovered restriction endonucleases. He was doing something similar to the triplet work around

the time Marshall was and has some other stories about that. I think it would be interesting for you to pursue that, to go over and talk to him sometime.

Harris: Okay.

Pittman: Ask him about that. Daniel Nathans won the Nobel Prize in 1978 with Hamilton O. Smith, who is also over at Hopkins, and Werner Arber in Switzerland. Dan discovered the restriction endonucleases which cut DNA at specific points. There are a whole lot of those enzymes. You can buy them from companies now to make your own DNA. But he told me a story the details of which I don't remember. Well, the implication of the story was that he could have got the triplets first, but he sort of backed off and let Marshall have it somehow. Everybody has his own axe to grind in this business, but I think it might be interesting for you to talk to him.

Harris: Is there anything else that you would like to say for the record?

Pittman: Well, I think the main thing I would want to get across would be that Marshall is just a superb biologist. He is a dedicated sort of guy. As a matter of fact, I don't know how much you are interested in *The Talmud*, and stuff like that, but there is a saying somewhere in there about "The greatest good is--" Hang on. I think I've got the book here. Maybe I can find it. Hold on a minute. Rather than waste your time on the phone, let me write it to you. But it has to do with studying. The greatest thing is to study. Study, study, study, study. To me that is Marshall. He just studies. That is what he is dedicated to. It has its down side. You neglect everybody else.

Marshall and Perola did not have any children. I remember sitting in their living room one time and saying, "You ought to go and adopt somebody. Suppose you don't have any kids and Perola runs off with somebody, and you're all by yourself." Here I was lecturing to Marshall about what would happen if he were all by himself without a kid; so that wasn't a good thing to say.

Harris: His work is his life.

Pittman: Yes. His work is his life, and I think it has a down side; but at the same time it's an admirable thing to be so dedicated. There is nobody I've seen who is more dedicated to understanding biology. He is the greatest biologist I know anything about, and I think that's the main thing I'd want to get across. He hasn't stopped. He's not going to stop until he dies.

Harris: You're probably right.

Pittman: I listened to his heart one time. He was worried about his rheumatic fever. This was 20 years ago or so. We were at some meeting together, and he took his shirt off; and I listened to his heart. He didn't have any problems that I could hear.

Harris: Well, I thank you very much.

(Whereupon, the interview concludes.)

This is an interview of Dr. James Pittman, Distinguished Professor at the Center for Advanced Medical Studies, University of Alabama at Birmingham, taken as part of the Marshall Nirenberg Collection for the National Library of Medicine and the National Institutes of Health Historical Office, on December 13, 1995. The interviewer is Dr. Ruth Harris.

Harris: Dr. Pittman, I'm going to let you start out and tell me about your first early encounters in meeting with Dr. Marshall Nirenberg as a boyhood friend.

Pittman: I have been trying to figure out exactly when it was, and I think it was the winter or early spring of 1943-44 (spring '44), when Marshall and I were both 16 years old and were in the second year of Orlando High School (eleventh grade). He was born on April 10th, 1927, in New York City (and I two days later in Orlando); but his family moved to Florida when Marshall was a child because he had an illness diagnosed as rheumatic fever, and they wanted to avoid a recurrence, which they were told would be less likely in the milder Florida climate. There was no penicillin then; so another streptococcus infection could have triggered another attack of rheumatic fever with resulting damage to the heart valves, etc.

I did not know him during childhood. The first time we met was at the Orlando High School in the winter or spring of 1943-44. The school was then called "OHS" by the students and now is one of several high schools in Orlando; it is the one now called "Boone High School." It was the high school for white kids; the only other high school in Orlando at the time was

on the west side of town for black children. These high schools covered the 10th, 11th, and 12th grades. Mr. Boone--I do not remember his first name--was the principal of the school when we were.

During the war, the Army Air Force had a big base in Orlando for training pilots. There was no Air Force in those days, only the Army Air Force and the Naval Air Corps; the U.S. Air Force was established as a separate service in 1947. At this army air base was a unit with a group of scientists called "The Arctic, Desert, Tropic Branch (ADT)." It was staffed by a number of biologists, I don't know how many--maybe a dozen, and perhaps other staff. Their job was to write pamphlets for the aviators about how to survive if you were shot down over the Arctic, the desert, or the tropics. One of their activities was to sponsor luncheons at which the only things served were plants or animals which could be obtained locally from the wilds of the swamps or beaches. We had one lunch where they served alligator steak, rattlesnake meat, raccoon, 'possum, sea purslane, hearts of cabbage palms, and all sorts of other local wild plants.

Harris: You and Marshall went to this?

Pittman: I don't know whether or not Marshall went to that luncheon; I don't remember his being there, and that's the only one I attended--probably invited by one of our ornithology friends in--the Arctic, Desert, Tropic Branch. In fact, it was probably B.Frank McCamey, the one who really got us started in biology. He was a young zoologist in the ADT Branch who

came to OHS and gave a lecture on birds. He showed a film about bird migration and other aspects of ornithology. At the end of the film several of us went down to the front of the room to talk and ask further questions; Marshall was one and I was the other--we may have been the only two; I don't remember. But McCamey was a nice fellow and invited us to go with him on some bird expeditions--looking around for interesting local birds. Of course, these fellows were professional biologists, ornithologists, and they were excellent biologists. Frank McCamey later taught at several universities, especially Connecticut and then went into forestry and wildlife management. The other main one was George M. Sutton, Ph.D., who was one of the great ornithologists of this century and who finished his career at the University of Oklahoma in Norman. Sutton taught us how to prepare bird skins for museums although maybe Marshall knew before that; I'm not sure. Probably Sutton taught him. Marshall and Sutton taught me, I know. Roger Tory Peterson of the "Peterson Field Guides" fame was also there. He was part of the ADT Branch. You have heard of him, I guess?

Harris: Oh yes. I have some of his books.

Pittman: Well, they were real professional ornithologists--and we would get up early and go out and put up mist nets, these little fine nets for catching birds alive, and we'd string them across a swamp, a long, narrow swamp. Then we would go to one end of the swamp and form a line of people and beat the bushes and walk through it and drive the birds into the mist net. They would

get caught there, and we would take them out and weigh and band them and release them. We learned a lot about bird identification and how to skin birds, make study skins, etc. I think Marshall may have done more taxidermy, such as mounting birds. Marshall and I also used to go hunting. I do not know how many times we went--perhaps a dozen. We went over to the St. John's river marshes or to the Indian River adjacent to Cape Canaveral, where the Kennedy Space Center is now.

I remember very vividly one sunny afternoon when there were three of us in a flat-bottomed boat in the reeds and sawgrass at the edge of a shallow slough in the St. John's River. Marshall was one, I was another, and the third was a local barber from Orlando, Hezzie Long. It was a perfect day, chilly but not too cold; bright sun; a breeze from our left, so that the ducks had to land from our right to left, providing a textbook target. We got thirty ducks that day, the legal limit, including a pair of wood ducks. I still have the male in the attic--well mounted, but in rather bad shape now 52 years later, losing feathers, etc. The romantic memory of an old man, now.

Sometimes we would go early on a week-end morning for one day's hunting. At other times we camped out and stayed several days. At night camping in a cluster of Australian pines, we would sleep to the singing of the wind in the trees. We would wake up before dawn in the winter and hear the eagles (bald eagles) calling. There were huge numbers of ducks, cormorants, terns, herons, roseate spoonbills, and things like that. The environment was

really beautiful then, and to my mind those were wonderful experiences; and they formed our outlooks and philosophies in an ideal fashion. At least they formed mine; you'll have to ask Marshall just how important they were for him. Perhaps those experiences did help awaken a sort of appreciation for biological science then. For example, at the end of a day searching for birds, we would fill out our list and try to give an honest estimate of the numbers of individuals we had seen for each species.

(Dr. Pittman describes next the site of a photograph taken in the 1940s of Marshall Nirenberg.) This was on an island in the Indian River adjacent to Merrit Island where Cape Canaveral and the Kennedy Space Center are now. The east coast of Florida at that point is really made up of spits of land, sort of big sand bars, and Merrit Island is one of these. Indian River is really an estuary of the sea and fairly shallow. One could wade out into that water, about waist deep, to a small mangrove island about two acres in size. We called it "Pelican Island," and I think it is still called that. It was filled with the nests of all sorts of birds, but especially brown pelicans. It is now a bird preserve, and today it is illegal to visit it without a permit. Probably the visits by Marshall and me were responsible for the unwitting destruction of some young birds, even though we tried to be careful. It was on this island that the photograph was taken.

The other photo of Marshall, which I think I sent, shows him holding a very large dark snake. That was an indigo snake we caught beside the road

between Orlando and the east coast one afternoon. It was a very docile snake, kept by some of the local natives under the house to catch rats and mice. I kept it in a cage for about a month, but it never would eat, so we finally just released it. Marshall knew all about such snakes, as he immediately studied any such find very diligently and thoroughly. I remember how he told me about the docility and utility of the snake shortly after we caught it.

Harris: You mean one of the photographs that you sent?

Pittman: Yes. That would have been sometime during 1944, probably the spring or early summer, in view of the many species of nesting birds. Sometimes there would be stingrays on the bottom; so we took long sticks and poked the bottom ahead of where we were walking to frighten the stingrays away. It was perhaps a quarter-mile from the shore out to the island. When you got out there, there were these low mangrove trees; you can see in the photograph. The pelicans nested in these. Then there would be sections of the island where there were lots of cormorant nests with their big blue eggs, and other areas with nests of American egrets or snowy egrets, and on the ground were black-necked stilts--tall birds with a white belly, black back, and pinkish legs. These would run around giving a "broken wing act" in an attempt to distract us away from the nest. Sometimes we saw other birds, such as the spectacular roseate spoonbills.

Harris: Would just the two of you would go on these trips?

Pittman: Usually, yes. Sometimes there would be a third, Hezzie Long, when we were hunting, or Ray Nicholson, a local ornithologist. But usually just the two of us went.

Harris: Did you get to know his parents and sister?

Pittman: Oh sure. I did not know his sister. I guess I may have met her a couple of times, but I did not really know her. She is in Mississippi?

Harris: She is in Texas now.

Pittman: Texas. Yes.

Harris: What were his parents like?

Pittman: His father ran a dairy farm that Marshall grew up on, and they were nice people. I ate at their house a number of times, and Marshall came to my house. His father was a quiet man. He was a good businessman. Marshall was very intense in his work, and Marshall's mother died at the NIH, you know.

Harris: Yes. I knew that.

Pittman: She had adrenal carcinoma, I think. I think that she died after I had left the NIH because I went back there several times and saw her while she was in there. She was getting a new experimental drug that did not do much good.

Harris: Who died first?

Pittman: She did.

Harris: She died first?

Pittman: Yes. I think that is right, and I think that Marshall's father was just very lonesome. This is speculation. But I never said anything much about it. Marshall said that his father had once told him several times, "Don't worry about the job. Medicine is just a job. You have to get up in the morning, go to work, go back home at night, and study, just like any other job."

Perhaps the dairy farm also guided Marshall toward nature study and biology. The dairy would of course be populated with birds that like that environment, like cowbirds, grackles, and redwinged blackbirds. I meant to tell you about the tremendous amount of noise in the pelican colony -- a lot of noise and activity.

Harris: You mean by the birds?

Pittman: Yes. You would go walking along through those mangrove trees, and all the birds would be squealing and squawking. The birds overhead would be shrieking and attacking you a little bit by dive-bombing you; and the the pelicans would vomit big fish out in front of you.

Harris: Oh.

Pittman: I have some old 16mm movies of these expeditions, mostly of Marshall examining the nests there and along the edges of causeways, which were fairly deserted in those days, big stretches of beach. The photos were made from these movies. I imagine most of that sort of land is gone now and that the tern nests are much reduced in number and extent.

My father admired Mr. Nirenberg. My father ran a lumber business there, building supplies, and I remember that when Mr. Nirenberg died, my father commented that he was a good, honest businessman, always paid his bills promptly.

Marshall's mother was a very soft, nice lady--just a bright pleasant considerate lady. I don't remember anything specific about her, except that she was the same at the NIH when she was so desperately sick.

I was trying to remember things for this interview, and it's funny what you remember. I guess Jewish people were more segregated or something in those days, but it never struck me much that Marshall was any different from anybody else. I remember wandering into a couple of parties he had or was attending, and people would tell me about how it is to be a Jew and everything as if I were Jewish. But one time when he was at the University of Florida, I had been accepted to medical school in Boston. It must have been late spring or early fall 1948. In fact, I may have stopped by on my way north to attend medical school the fall of '48. He belonged to Pi Lambda Phi--was that it?

Harris: Yes.

Pittman: Yes. He was in that fraternity, and I stayed there one night on a trip somewhere. They were having a party that evening, and this guy got me off in a corner and said, "You think you have seen antisemitism; but wait until you get to Boston, and you will just have all kinds of problems." He went

on and on, and finally I said, "Look, I am Presbyterian; I don't think I will have any problems." But it was funny. But it was funny.

Harris: Where did you go? You did not go to the University of Florida?

Pittman: I went to a Presbyterian college in North Carolina named Davidson. I was going to be a Presbyterian preacher, and that did not seem to interfere with anything. The guy who sent me to medical school was my Sunday School teacher because I majored in biology and loved reading about it. I wrote a paper on evolution, and I remember going to Sunday School one day, and a kindly old gentleman with a big shock of gray hair and bright blue eyes looked at me in horror and said, "You believe in evolution! You are going straight to hell!" And I thought, "I'll never make it in this business. I'd better be a doctor and/or a medical missionary."

Harris: Well, you were good friends in high school with Marshall. What happened when you went to different colleges? How did you keep in touch with one another?

Pittman: Oh, I do not know. We just saw each other once in a while, in Orlando for the most part, I think. Anyhow, in 1948 or '49 he went back to Orlando. You will have to get this from him. I do not have the times straight. I think he went back and worked on his father's farm, which was being converted to a candy business then. Later he returned to the University of Florida and earned a master's degree in biology for studies on Caddis flies. I noticed that his M.S. was actually in 1952. I would have thought it would have been

earlier than that. I didn't see much of him during that period, but I remember he was collecting Caddis flies. He described a few new species. I'll bet you he knows more about Caddis flies than anybody else at the NIH!

Harris: Well, he did work as a salesman after he graduated from the University of Florida. He worked as a candy salesman.

Pittman: For his father?

Harris: Yes. For his father, and then he went back to graduate school; so that's why you see the gap.

Pittman: It would be interesting to know what his grades were. I'll bet they were about average or a little over average.

Harris: What kind of student was he in high school, or do you recall?

Pittman: I do not recall anything special. He was probably okay. Just nothing special. I do not think he was in any big honorary societies. He was quiet. He has always been a very quiet guy. I think, for my money, he is one of the best biologists, or "THE" best biologist, I ever saw, and the most dedicated. I mean, he just loves that stuff.

There were three of us. There was another guy named James Boyles, and he became a biology teacher also. He was teaching in recent years at the University of South Alabama, I believe. I have lost track of him pretty much. But he was the reptile guy, and we collected snakes, a lot of snakes, too.

But ask him about Caddis flies. I believe he described several new species.

Harris: I did already because I had talked to you previously.

Pittman: Do you know how to catch Caddis flies?

Harris: No. How?

Pittman: You go out in the evening, and you string a wire between a couple of trees. You hang a sheet from the wire, and you hang a bright lantern behind the sheet, or on one side of the sheet. Then you put a trough, a sort of a metal trough, along the bottom of the sheet, and the Caddis flies fly into the sheet and fall down into the trough. You can get them out of the trough. I do not remember whether he had anything in the trough or not. But I went out with him several times doing that. As he explained it to me, you could tell the degree of purity or pollution of a stream by the kinds of Caddis fly larvae that lived in the stream because they make little stick houses and live in the water. I would put something about that in there because he was a good biologist.

The other thing that I was thinking about--there was a big marsh near his house on Highway 441 out near the Orlando Country Club, I believe. That thing had a lot of red-winged blackbird nests in it one spring, and we went out there and took some pictures. Mostly my pictures of Marshall are of his hands holding the bushes aside so we can get a picture of the nests. But

as we came out, a big truck, piled up with grapefruit, came past, and these kids in the top of the truck threw grapefruit at us.

Harris: Oh, my goodness.

Pittman: They were just mean and rowdy kids. I don't remember whether we got hit or not, but they splattered all over the place.

I remember hunting with Marshall one time, and I got a double which impressed him. I shot into a batch of ducks and got two at once.

But I guess the romanticism of the thing is what strikes me most, just camping out in the midst of all that natural history. Have you ever heard of an Australian pine? It is a big pine with sort of tubular needles, and the wind in those makes a wonderful sound.

Harris: Well, can you tell me about when he was to the National Institutes of Health and you had spoken for him at the University of Alabama? I asked him about the University of Alabama.

Pittman: Yes. What did he say?

Harris: It was my understanding that you had approached someone at the biochemistry department at the University of Alabama Medical College about a position for him.

Pittman: I did?

Harris: Yes.

Pittman: You see, I think you said in your letter to me that he had sought a position there. He did not seek a position here.

Harris: Can you please go into that and explain what happened?

Pittman: Well, he finished his Ph.D. in biochemistry at Michigan, didn't he?

Harris: Yes, he did.

Pittman: Yes, he finished it in '57.

Harris: Yes.

Pittman: In 1957 and 1958 he worked at the NIH; his postdoc was with DeWitt Stetten at the NIH.

Harris: That is correct.

Pittman: Stetten, who I think had gout, thought that the serum uric acid level paralleled somehow the intelligence of the person, and he went back in history. I do not remember who they all were who had gout--but there were Benjamin Franklin and others. He thought that the high uric acid might be related to intelligence, and he wanted Marshall to work on that. I do not remember what experiments he wanted Marshall to do. That was before the days of knock-out mice and that sort of thing, but as I recall, he wanted Marshall to somehow raise the uric acid of rats or mice and put them in mazes and see if they performed better. I do not know what that has to do with anything. Marshall could tell you more about what he wanted to do. But Marshall thought the whole thing was the dumbest thing he had ever heard of, and most people would agree with him; so he went off into studying what the next thing was, and I guess Stetten must have gotten mad at him or thought he was not any good because he fired him. He did not

actually fire him; he just didn't give him a second year of fellowship. They are usually a two-year postdoc or more.

And you know who might be able to tell you about that is Jan Wolff.

Do you know him?

Harris: No.

Pittman: He is over in Building 5, I believe, up there at the NIH.

Harris: Okay.

Pittman: But there might be somebody else around who could give you information, and he is right there at NIH. I would talk to him. He knew Marshall. He knows Marshall. There are probably other ones, but I don't think Ira Pastan would be one. I do not know who would be the best one to ask. In fact, I do not think Ira was around then. But Jim Field might. He is in Boston now. But anyhow, Marshall, as of the summer of '58 did not have a job. Yes, it must have been the summer of '58. I know that I came here from the NIH in 1956, and in 1956 to 1957 I was a resident. Then from 1957 to 1958 I was chief resident. In 1958 they hired me and gave me a lab which had a Ph.D. position, and it was a V.A. laboratory, funded from the V.A. research program. It had a Ph.D. position which the previous guy had left, and I had an empty slot. I knew Marshall had a sister. I thought that she was in Mississippi at the time, but maybe that is not right. She was down in this area somewhere; so I thought that maybe he would be interested in coming back south again, especially if he didn't have a job. I had him come down. I

do not think that there is any way I can check the exact time of that; but, at any rate, he came down and gave some talks.

It is interesting to me. I think there is a general principle here. He talked almost entirely about cyclic-AMP. Now cyclic-AMP, the messenger molecule, was only discovered in 1957, and this was 1958. People knew it was important, but it was not yet a fashionable topic; and they did not know or realize the full significance of cyclic-AMP at that time; but Marshall did. The general point is that, I think, to be a great researcher, you have to have a good nose, like a bird dog, to be able to identify the problem that is a significant problem and pursue that; and Marshall has certainly always had that.

But here it is only one year, maybe less than 12 months after the discovery of this molecule, and that is all Marshall talked about. Sure enough, in the next 10 years it was a big deal. A lot of research came out of that and, of course, Sutherland won a Nobel Prize for that. I think maybe Marshall's Ph.D. thesis may have discussed it. What was that on?

Harris: It was on ascites tumor cells.

Pittman: Ascites tumor cells. Right. He may have talked about that, too. I do not remember. I think he did work [on] glycogen metabolism in those because Warburg had just said that they were all out of aerobic metabolisms. But I remember he talked a lot about cyclic-AMP. This is the part I don't know whether to tell you, but I will: I had the money and the space and everything,

and I went over to see the chief of biochemistry, the chairman of the department of biochemistry, whose name was Emmett B. Carmichael, and Emmett B. Carmichael was a noted antisemite around here. He really was.-- He is dead now.-- He spent a lot of time trying to prove that Goldberger didn't really discover the basis of pellagra, and the nutrition guy here, a fellow named Butterworth, who had no particular interest in the whole thing, just lambasted Carmichael for his ridiculous positions. Carmichael didn't seem to be a bad guy. He just was antisemitic, and I didn't know any of this stuff. I just had my lab over there. So I went to see Carmichael, and I said, "I'd like to give this fellow an assistant professor position in the department of biochemistry. He is a biochemist, and he won't come unless we give him some sort of academic position." I think he interviewed Marshall. I went back and talked to him again, and he said, "What did you say his name was?" I said, "Nirenberg."

He said, "That's a Jew name, isn't it?"

I said, "What are you looking for, religious leader or a biochemist? He's a good biochemist."

He said, and this is a fact-- what the guy said; he said, "Oh, it has nothing to do with religion to me. I'm a liberal as far as religion goes. I've got three secretaries out there. One of them is a Baptist, one is Presbyterian, and one of them is a Methodist."

That's exactly what he said. I think I've told Marshall that story since then, but I don't believe I told him then. I probably just told him that we were having trouble.

We went over to the dental school, and the dean of the dental school, a fellow named Joseph Volker, who really is the one who built this place and who came down here from Tufts, said, "Oh, we'll give him an appointment in the dental school." Somehow the atmosphere, I don't think, was quite right. Maybe word of that got out somehow, or maybe Marshall just did not want to come down here because what happened was that Gordon Tomkins gave him a job. Have you ever heard of Gordon Tomkins?

Harris: Yes. Marshall has described him.

Pittman: He was a great guy, and he died a tragic death because they did not do the darned operation right at Columbia P & S. But he gave him a place to work there, sort of hang out, and that was 1958. I must have been back at the NIH in the summer or spring of 1959.

Harris: Did you work at the NIH while Marshall Nirenberg was working here?

Pittman: No. I left. I was there from 1954 to 1956 and came here.

Harris: You just said that you came back here in 1959.

Pittman: Oh, I made trips up there just to visit. I was on a couple of committees, I guess. I do not think I was on any committees then. I do not know what I was doing back up there.

Harris: Was Dr. Volker in the dental school agreeable to hiring Marshall?

Pittman: Oh, yes. He was all ready to go. Volker later became vice president, and then president, and then chancellor of the whole system. Sure, this guy Carmichael was an aberration, I think. He was old. He started working in the department of biochemistry in 1927 in Tuscaloosa. But Tuscaloosa was a two-year school, and he moved up here in 1946. He was a dinosaur. But that's a true story.

Harris: Later after Marshall Nirenberg deciphered the first code word, did you have him down to speak at the University of Alabama?

Pittman: I had him down a couple times. I wanted to tell you one thing, though, about the summer of 1959 or so. I was up there. I knew Gordon Tomkins. I liked all these guys. We had been at his home in Boston and just in various ones. I saw Marshall, and I am pretty sure it was at the NIH because I think it was in his lab because some of my other friends like Jan Wolff, Stan Segal, and Jim Field and other people stayed up there and stuck around. So I saw them often. But I was in this lab, and Marshall was standing there; and I said, "Well, what are you going to do this summer, or next summer?" He said he was going to go to Cold Spring Harbor and take a course in genetics. I remember Gordon said, "If you can get in. They probably won't let a junior person like you in." He said that "oh," he thought he would get in. Well, he got in, and that was when he really went to work on the sequence and the code. But ask him about that course at Cold Spring Harbor and how much influence that had on him.

Harris: Yes. He has spoken about that.

Pittman: Was it important?

Harris: Yes it was, indeed.

Pittman: Yes. That was my impression. He's been here at least three times. There was a genetics symposium here, and it was before he won the Nobel Prize. I wanted to get him down, and we got him down to talk at that. It was the highlight of that symposium. But then we had him down to dedicate a new research building here, and that was the time I found this old skin of a western palm warbler, I think it was, that he had skinned in 1944 or thereabouts. I still had it. It was in the original little cardboard box, a shotgun shell box. I gave it to him, and before the audience as he held it up by one leg, the skin broke and the rest of it fell on the floor. But that is in a letter I sent up to the NIH.

Oh yes. Another thing I wanted to tell you was about this bird dog instinct of Marshall's for ferreting out--knowing--exactly what the problems were. It was about 1964 or 1965, and we had had supper, and he wanted to go home. I think maybe Wolff was with us. We wanted to go out somewhere, but Marshall did not want to go; he wanted to go back home and study. I asked him, "What's the next big problem?" This was after the triplet was found, and he had written some things about how the whole code was going to be known very shortly. He wrote an editorial in *Science*. Have you seen that one?

Harris: Yes. I have a copy of it.

Pittman: I think that's a good editorial. Anyway, I said, "Well, what's the next big question?" He said, "How you turn them on and off." Of all the biological questions today, it seems to me, they boil down to that, to gene expression, how gene expression is controlled, and that's what 90 percent of the work seems to me to be on: gene expression. Marshall said that; it must have been not later than 1964. So he knew; he just has an instinct for knowing where the big questions are.

But he came down in 1981 or 1983 to dedicate that new building. He stayed a short time. Oh, we had Phil Leder down, too. He was always very proud of Phil Leder. I guess Leder will never win the Nobel Prize now that Tonagawa won it. But we had Phil Leder down for Medical Student Research Day here, and it was the day after Marshall came down to dedicate this building. I mentioned to Marshall that he ought to stay over. He had already won the Nobel Prize and was, of course, world-famous by then, but I got him to introduce Phil Leder. I thought that was a nice touch.

Harris: Now, of course, you must know Marshall Nirenberg's wife?

Pittman: Perola.

Pittman: I've been at their house once or twice years ago.

Harris: Did you go to their wedding?

Pittman: I don't think so. No. I don't know. When were they married?

Harris: 1961.

Pittman: 1961? No, I didn't go to their wedding. I was here working very hard.

Harris: Did Marshall Nirenberg come to your wedding?

Pittman: No. I was married in Boston. It was a bunch of physicians. I don't know. It was a bunch of Boston people, residents and people like that.

Harris: Nowadays, how do you keep in touch with Marshall Nirenberg?

Pittman: Through people like you. I haven't seen him in a couple of years, I guess. We do not correspond a lot. Maybe he corresponds with somebody; he doesn't correspond with me. We do not have a lot to talk about except about what he is doing in science. The course of my life has been different. I had a lab in the 1960s and worked on the thyroid, and it was sort of semi-clinical. My view is that M.Ds. who see patients ought to work on something that has to do with patient care; and if you try to be a biochemist, you ought to quit trying to see patients. There are people like Joe Goldstein, who won the Nobel Prize, down in Texas; he still makes rounds. The kids love to make rounds with somebody smart enough to win a Nobel Prize and be a great cell biologist, but I would not want Joe taking care of me if I got a coronary. My view then was that I ought to do more clinical stuff, and so I did. I did some biochemistry, but it never amounted to anything. I worked on control of TSH secretion, hypothalamic hypothyroidism, human iodine intake, and that sort of thing. So the course of my career was different.

I moved back to Washington in 1971. I must have seen Marshall a bit then, I guess. From 1971 to 1973 I was head of the Research Program in

the V.A. Then I came back here as dean, and you do not do anything except sit in meetings and drink coffee, recruit faculty, and allocate space and money as dean. So I saw Marshall. That was when we got him down to dedicate the building.

Harris: A quick question about you and your career. Have you concentrated on research, or have you concentrated on taking care of patients?

Pittman: I have always seen patients. I love to see patients, and I still see patients. I saw a bunch of them yesterday morning. I am trying to cut back now. It is very difficult to do that a little bit. I try to see patients only on Tuesdays and Thursday mornings, but they get sick at other times, too; and they call you up; and if you are at all conscientious, you have got to answer. It takes a lot of time.

Harris: Do you teach?

Pittman: Yes. I teach. I had a lab from 1958 to 1971 or 1972. I guess I had one before that. But I did try to be a biochemist and joined a bunch of societies and things, but I think it is very difficult. If you do both, you tend not to do either very well. There are a few people who seem to be pretty good at both. Jim Wyngaarden is one example. But if you look at Jim Wyngaarden's career, he did not do both simultaneously. He sort of oscillated to concentrate on biochemistry, and then he would go back and do more patient care and then go back and do biochemistry. But there are very few people like that. Most people sort of fall into one or the other, or else they become

mediocre at both, and I think I am afraid that I fall into the last category--sort of mediocre in both of them but more emphasis on patient care. But it certainly has not been in the gene business. Marshall was in the lead of the gene business.

You know another person you might talk to that would be interesting is Dan Nathans over at Johns Hopkins. He discovered restriction endonucleases. Those are the enzymes that cut DNA at different spots so that you can make different lengths of DNA. It facilitates analyzing it and constructing different kinds of plasmids and DNAs. Dan had a peculiar story he told me one time. Dan was at the NIH in probably 1955 through 1957--I'm not sure exactly when. But Dan went back to Columbia in New York and was a resident and chief resident in medicine. He was a very good clinician. Then he went over to Rockefeller and dropped out of clinical medicine and became--and I think he probably still is--head of microbiology at Hopkins for many years. He is another interesting guy. Well, he was at the NIH and he is a Nobel Laureate. Why don't you do a whole series of Nobel Laureates who have been at NIH? That would be interesting. I'm just looking in a book to see if Dan Nathans is still head of microbiology. Well, he's not listed in the last book here. He is probably retired from that. But he was for a long time head of microbiology there, and he discovered restriction endonucleases. He was doing something similar to the triplet work around

the time Marshall was and has some other stories about that. I think it would be interesting for you to pursue that, to go over and talk to him sometime.

Harris: Okay.

Pittman: Ask him about that. Daniel Nathans won the Nobel Prize in 1978 with Hamilton O. Smith, who is also over at Hopkins, and Werner Arber in Switzerland. Dan discovered the restriction endonucleases which cut DNA at specific points. There are a whole lot of those enzymes. You can buy them from companies now to make your own DNA. But he told me a story the details of which I don't remember. Well, the implication of the story was that he could have got the triplets first, but he sort of backed off and let Marshall have it somehow. Everybody has his own axe to grind in this business, but I think it might be interesting for you to talk to him.

Harris: Is there anything else that you would like to say for the record?

Pittman: Well, I think the main thing I would want to get across would be that Marshall is just a superb biologist. He is a dedicated sort of guy. As a matter of fact, I don't know how much you are interested in *The Talmud*, and stuff like that, but there is a saying somewhere in there about "The greatest good is--" Hang on. I think I've got the book here. Maybe I can find it. Hold on a minute. Rather than waste your time on the phone, let me write it to you. But it has to do with studying. The greatest thing is to study. Study, study, study, study. To me that is Marshall. He just studies. That is what he is dedicated to. It has its down side. You neglect everybody else.

Marshall and Perola did not have any children. I remember sitting in their living room one time and saying, "You ought to go and adopt somebody. Suppose you don't have any kids and Perola runs off with somebody, and you're all by yourself." Here I was lecturing to Marshall about what would happen if he were all by himself without a kid; so that wasn't a good thing to say.

Harris: His work is his life.

Pittman: Yes. His work is his life, and I think it has a down side; but at the same time it's an admirable thing to be so dedicated. There is nobody I've seen who is more dedicated to understanding biology. He is the greatest biologist I know anything about, and I think that's the main thing I'd want to get across. He hasn't stopped. He's not going to stop until he dies.

Harris: You're probably right.

Pittman: I listened to his heart one time. He was worried about his rheumatic fever. This was 20 years ago or so. We were at some meeting together, and he took his shirt off; and I listened to his heart. He didn't have any problems that I could hear.

Harris: Well, I thank you very much.

(Whereupon, the interview concludes.)