JAMES BOWMAN ORAL HISTORY INTERVIEW

Session I - June 26, 2006

1. Early Life, Segregation and Integration, Training at Howard, and Residency at Chicago

Andrea Maestrejuan: It is June 26th, 2006, and I'm with Dr. James [Edward] Bowman at his home in Chicago, Illinois. I'm Andrea Maestrejuan to conduct his oral history interview for the UCLA Human Genetics Oral History Project. I always start at the very beginning, and I'll ask you when and where you were born.

James Bowman: I was born in Washington, D.C., February the 5th, 1923.

AM: Tell me a little bit about your parents' background. Did they grow up in D.C. as well?

JB: Yes. My father [James Edward Bowman, Sr.] was a dentist. My mother [Dorothy Bowman] was a homemaker. We lived in Washington, DC, and after about two or three years, my father decided to go to Homestead, Pennsylvania, to practice. He said he thought it would be much nicer, so we went to Homestead, Pennsylvania. But then came the Depression. The steel mills were operating there and all of a sudden one day the lights were on - then everything was dark. And all of a sudden patients didn't have any tooth aches, so he decided to go back to Washington, DC and he practiced in Washington, DC until his death when he was about sixty-five years of age.[1]

I went to back the Washington DC, I went to grammar school, junior high school (I skipped the last grade), and then to Dunbar High School. It was a very famous high school where black students went. Of course, there was complete segregation there in Washington, DC. In those days, one could only go to theaters, movies, restaurants in the black neighborhood. I had a wonderful education at Dunbar High School. Many of my teachers had PhDs from white universities. I then matriculated at Howard University and then to Howard University College of Medicine.[2] My father was a dentist, and he always wanted me to be a dentist, but I never wanted to be a dentist. Finally, I told him, "No, I just want to do medicine." I entered Howard University Medical School, and that was the time during the war in which we were drafted into the army as part of the Army Specialized Training Program[3]. We all were privates first class, the whole time I was in

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[1] He was robbed and shot to death.—ref?

[2] A private university in Washington, DC, founded for African-American students in 1867. For more information about HUCM, see their website: http://medicine.howard.edu/about/overview.htm.

[3] During World War II, the United States Army began a military program at many American colleges in order to fill the demand for officers who were educated in various academic subjects, of which medicine

medical school, but the Army paid for our education, which was very nice. We were expected, when we graduated from medical school, to go into the Army. But at that time, the Department of Defense decided that they did *not* want any black officers, particularly medical officers. There were friends of mine who I knew from other universities, and they were drafted as first lieutenants in the Medical Corps. We were discharged from the Medical Corps and I didn't have to go—at that time. I was quite pleased. (chuckles)

After I graduated, I did an internship at Freedman's Hospital in Washington, DC.[4] At that time, I thought I wanted to be a surgeon. In those days, one had a choice to take one a year internship or two – you'd never do that now. I said I would have two. So I had an opportunity to come to Provident Hospital in Chicago.[5] I always heard about Chicago, that it's a very nice place.

To back up very carefully, I went there, I started for a while, and I was going to do a second internship. There was a very nice pathologist at Provident Hospital, and I assisted him in autopsies, and I became fascinated with that. He said, "Well, my friend Dr. Edward F. Hirsch is head of pathology at St. Luke's Hospital[6]." He said, "You look like you're a very wise young man. I'll see if he can take you on as a resident." [I was] halfway through my resident internship. I thought I'd take a chance and do it.

St. Luke's Hospital – it was very interesting. I went for the interview. It was on the eighteenth floor of St. Luke's Hospital, and it was on the Indiana Avenue side. I went up to the eighteenth floor and had a nice talk with [Dr. Hirsch]. He said, "I'd like to offer you a fellowship," -- just like that! But in those days, Negroes then were not allowed to live in the residents' quarters. I had a fellowship of a hundred dollars a month, and tried to pay room and board, and I had to commute back and forth to St. Luke's Hospital.

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was in particularly high demand. Students completed accelerated programs and were expected to go directly into service when they completed their degrees.

[4] Created as a hospital for freed and disabled African Americans in 1862, Freedman's Hospital became the teaching hospital for Howard University's College of Medicine in 1868. See http://www.nlm.nih.gov/hmd/medtour/howard.html for more information.

[5] Provident Hospital, the first black-owned and operated hospital in the US, was founded by surgeon Daniel Hale Williams in 1891. In 2011, it was part of the Cook County health system, serving Chicago's South Side. See http://www.ccbhs.org/pages/ProvidentHospitalofCookCounty.htm/ for more information.

[6] Now known as the Rush Presbyterian St. Luke's Medical Center, the hospital was founded in 1864 in Chicago. It merged with Presbyterian Hospital (founded 1883) in 1956 and then with Rush Medical College (which opened in 1883) to form Presbyterian-St. Luke's Medical Center, a major teaching institution on Chicago's West Side, in 1969. As of 2011, the complex was known as Rush University Medical Center.

When I started, my friend said, "You don't want to go to that place. That's a horrible place. They don't allow Negroes in that place." I said, "Well, I've been accepted, so I'm going to do it and take a chance." And they said, "But you know you have to go in through the back door of the hospital. You cannot walk into the front door of the hospital." Well I said, "That's absolute nonsense. If I'm a resident there, I'm going to walk through the front door." (chuckles) So the first day I went there, I walked in the front door and looked around. All of a sudden, the Negro maids and janitors looked at me and *stared* at me and followed me down the hall. I went in there, and nobody said anything. The next day, I walked in the front door, and there was a *crowd* of Negro janitors and maids there waiting to go in the front door with me. (laughs) So I integrated the front door of St. Luke's Hospital!

I had a wonderful time with Dr. Hirsch. He was also on the faculty of the University of Chicago[7] . He was a very prominent pathologist. He was very nice to me. My [fellow] residents were all, of course, white, and there were no Jews. The only Jewish residents were in psychiatry, and no other part of it. But my colleagues were very nice. I was living on a hundred dollars a month, which wasn't much. They could take a guest for lunch every day free, so they would circulate and take me for lunch as their guest. (laughs)

AM: Were there other African-American residents there?

JB: No, I was the first and only. Then after I finished my [residency] there were two others that followed me. Dr. Hirsch hired two others too to come in there. And that was it. I was the only one all by myself, wandering around. But I had a wonderful, wonderful time, my colleagues were nice, Dr. Hirsch was just a wonderful person to me. And after that I had an opportunity to be head of pathology at Provident Hospital where I had started my internship before. And then I took my boards in pathology, path[ological] anatomy, clinical pathology and there I was at Provident Hospital.

And I did not register for the draft because I thought, well they discharged me from the Army, and they don't want me. And the draft came up and I thought that I was still in the Reserves, but I was *not* in the Reserves. I was discharged into what they called the Army of the United States[8]. And I didn't even know! I thought I was in the Reserves. And all of a sudden a friend of mine who was head of the draft board he said,

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[7] The University of Chicago, a leading private research university on the city's South Side, was incorporated in 1890 with an endowment from John D. Rockefeller. For more information, see http://www.uchicago.edu/about/index.shtml/.

[8] Not to be confused with the United States Army, the Army of the United State is the official name for the conscription (i.e. the draft) force of the United States Army that may be raised at the discretion of the United States Congress in the event of the United States entering into a major armed conflict. The Army of the United States was utilized in World War II, the Korean War, and the Vietnam War.

"Jimmy, why haven't you registered for the draft?" I said, "I don't have to register, I am in the Reserves!" He said, "You are not in the Reserves." This was after about 3 or 4 years - I was wandering around, and my friends were being drafted. I thought I didn't have to go. (laughter) He said "Well, if you don't volunteer we are going to draft you as an *in*-voluntary volunteer." I said, "Well, I want to be a *voluntary* volunteer." Because he said if you are a voluntary volunteer, and since you have your specialty and your boards, you can pick any place you want to go in the Army.

He said, "Now the best place to go is the Armed Forces Institute of Pathology." That was the premiere place to go to. I said, "I don't want to sit there and look at slides for 2 years." I said I wanted to do research, because I had done some research with Dr. Hirsch on animals, things like that. It wasn't published but I had a wonderful time there. I heard of an opportunity at a place called the Medical Nutrition Laboratory[9]. At that time it was stationed in Chicago. I said, "I'd like to go there." So I was drafted into the army and I worked for about 6 months in Chicago and every night I would come back at night and do work at pathology – do the surgical pathology. I was doing two things and they allowed me to [do] it. Then all of a sudden they decided to shift the Medical Nutrition Laboratory to Denver, Colorado. I said, "Well, isn't that something!" I should have backed up and talked about my wife.

I met her in Chicago when she was a junior at Sarah Lawrence College[10], and I was courting her and what have you, and I was doing pathology and finally we decided that we wanted to get married. One day I went to visit her parents and her father and I were playing bridge and while he was in the midst of a heavy hand and I said, "I'd like to marry Barbara." I wanted to take him off balance because I knew he was going to get me off balance! He got up and walked around [imitating clearing his throat sounds] looking surprised, you know. He said, "You know, Jimmy, Barbara is at Sarah Lawrence College." I said, "Yes." He said, "I want her to finish." I said, "Yes, fine, of course - I can't afford to send her to college!" (laughter) I said, "Of course I want her to finish." Well, I called up Barbara at Sarah Lawrence and she *screamed* at me, "How could you say that!?" I said, "But I can't! We don't want to get married until after you [graduate]." We had never talked about [getting married earlier]. (laughter)

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[9] The U.S. Army's Medical Nutrition Laboratory in Chicago (founded in 1942 as the Food and Nutrition Laboratory) carried out many studies of troop health and nutrition in different environments, and developed the famous C, K, and other standard rations. The program evolved into the Letterman Army Institute of Research, but was phased out in 1980 and its equipment and facilities transferred to the US Department of Agriculture. A new Military Nutrition Division was created in 1986.

[10] Founded in the 1920s, Sarah Lawrence began as a women's college (it is now co-ed) with a strong tradition of innovation and educational progressivism. For more information, visit their website at: http://www.slc.edu/about/History_of_the_College.html.

Well after she graduated - two weeks after she graduated - we got married in Chicago in 1950. And she said, “I’d like to go the University of Chicago for my master’s degree.” And so [I said], “Fine.” Barbara’s father said (through the grapevine), “I’d like to pay for it.” We sent back, “Nope,” I said, “we’re married, we are on our own, we will do it ourselves.” So we worked for two years, and Barbara taught at the lab school preschool while she was doing her masters and I was in pathology. And finally after two years she got her master’s and her father sent word, (also through the grapevine), he said, “I’d like to give Barbara a graduation present.” I said, “Fine.” And then the word was that the graduation present - he had calculated how much we had spent for two years and that was going to be his present! He said to Barbara, “Is he going to accept it?” I said, “Yes I will.” I said, “We did it on our own. He’s happy, I’m happy.” I didn’t want to make him angry about that and it was very nice. So we accepted the present. (laughter)

AM: That’s great. Well, let me take you back a bit.

JB: Yes, I have skipped over very, very fast.

AM: Yes. Did your father come from an educated family?

JB: Yes. Well, no he was the first one - the first one in dental school. No he didn’t [come from an educated family], no. And my mother’s [family] - I didn’t know too much about them. I just knew her [his mother’s] mother, because the [rest] were dead by that time. I don’t know too much of the family on that side.

AM: Do you have siblings?

JB: Oh yes, oh yes. I had five siblings and I was the oldest. Two are still alive, the rest are dead. I had a sister who had a master’s in education, two brothers that were engineers, I have another sister (who is alive) who is a banker - she went to college. And then I have a brother who is still alive who is also a dentist. So all of us were educated.

AM: So your parents had high expectations for their children?

JB: Oh yes – I mean, there was no question! That was it. This was what you were supposed to do. (laughter)

AM: And you had mentioned that you went to a really high quality high school, this Dunbar High School.

JB: Oh yes, Dunbar High School was a very famous one. It was *the* high school to go to in the country because it was very academically oriented. There were things that I didn’t understand until after I left because there was Dunbar High School which was the *academic* high school. The students were *supposed* to go to college, and they all did.

Right across the street was Armstrong High School, which was a *technical* high school. They would do woodwork and plumbing and what-have-you. Then there was another that was for secretaries, and business things in high school. And I realized that friends who went across the street probably hardly ever went to college, and the other one too. But they came out [of high school] and got excellent jobs and did work. But we were expected to [go to college] and that's the way that it was. I had wonderful professors there, just absolutely wonderful.

AM: What kind of course work [did you do]? One would assume if your father wanted you to be a dentist that you were encouraged to take science classes.

JB: Oh yes, I took science classes. It was balanced.

AM: When people asked you what you were going to do did when you went to college was it always medicine, did you have other career ideas?

JB: No, no I didn't have any [other] aspirations. I knew that was what I wanted to do for a long long time. My father used to drive by there and say, "There's a medical school. There's the dental school." He would look at that and I would look at the medical school, and finally I said, "I don't want to go to dental school, I want to go to medical school." And I applied and I was accepted.

AM: And for going to college, Howard [University] is in DC, but did you consider any other universities?

JB: No, I didn't at that time, because my father was very – he said, "This is a great place and this is where you are going to go!"

AM: Did he get his training there?

JB: Yes, yes.

AM: Ok.

JB: But I had wonderful, wonderful professors there – really wonderful. There was one who everybody knows about - Ralph Bunche[11], who became the Secretary General[12].

AM: The history department at UCLA is housed in the Bunche Hall which is named after Ralph Bunche. He is quite a figure there at UCLA.

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[11] Ralph Bunche is best known for winning the Nobel Peace Prize for his work in negotiating an armistice between Israelis and Palestinians in 1949. He was educated at UCLA and Harvard and was an advocate for racial equality. For more information, see his brief biography at: http://nobelprize.org/nobel_prizes/peace/laureates/1950/bunche-bio.html.

[12] Bunche was Under-Secretary General of the United Nations.

JB: Oh - is that right? He was one of my professors. And then there was another man by the name of Eric Williams[13]. He had his DPhil from Oxford and he spoke with an English accent. We used to always tease him behind his back, and he would say, "sh-edule," and things like that. But we became very close friends when I was at the medical school because a friend of his was a classmate from Trinidad (which is now Trinidad and Tobago). And we were close friends, so we used to go up to Eric Williams' house and study at night. We were very good friends and he was very radical at that time, *very* radical. His dissertation was on the slave trade and the reason why the slave trade was ended was not because they wanted to be magnanimous and what-have-you – it was an economic thing. So he got his DPhil from Oxford. And then interesting enough, after he left Howard, all of a sudden I looked in the newspaper, and he was elected Prime Minister of Trinidad and Tobago. The first Prime Minister there - a very close friend. Now after he became Prime Minister, he was very conservative. And his constituents said, "Well, he's too conservative, he's not radical enough. At one time he was a radical but now he's too conservative." But I had many other professors like that who had doctorates from all over the world at Howard University. It was a wonderful, wonderful environment.

AM: What kind of curriculum did you take? Did you declare a major?

JB: Oh yes, I majored in biology. It was premedical and I decided that it was no problem whatsoever - this is what I wanted to do. That was it.

AM: And did you have many opportunities as an undergraduate at Howard to do research-type courses or electives?

JB: No, no. None whatsoever, [it was] straight forward, no research what-have-you. Not even in medical school – in this day and time it is expected to do something like that. But [then] no, I did not.

AM: And what kind of genetics were they teaching at Howard for undergraduates?

JB: [pause] None.

AM: None, ok.

[13] Eric Williams (1911-1981) was born in Port of Spain, the capital of Trinidad and Tobago and studied history at Oxford, where he earned his undergraduate and doctorate degrees. His controversial and influential thesis *Capitalism and Slavery*, published in 1944, earned him a lasting legacy among historians of the Afro-Caribbean world. He served as Prime Minister from 1956 to 1981. To learn more, visit the website at: http://www.encyclopedia.com/topic/Eric_Williams.aspx

JB: And it was rare all over! There was none. No, my interest in genetics was sort of through the back door. It was accidental. I will tell that [story] - we are getting ahead of ourselves – but it's a wonderful story.

AM: And did you consider going any other place to medical school beside Howard?

JB: That was the only place and my father said, "That's where you are going." That's it. In those days there was no other choice! (laughter)

AM: So when you started off at college and you said, "I am going to be a doctor," what did you figure you would be doing? What kind of practice did you think you would have?

JB: I had no idea whatsoever. I said I was going to medical school and I would see what happened after. I had no plans whatsoever. I was going to take things as they came and see what I liked. The interesting thing about medicine -- and also in college too is that – I would take a subject and I would love it, and [I would say], "This is what I want to do!" Then I would take another subject [and say], "This - I love it—*this* is what I want to do!" And that's what it was, [I] went from one thing to another. I loved it - I said, "Maybe I should be a surgeon or maybe I would like to be an internist." Maybe I should do this and maybe I would do that. Because I did have some very wonderful teachers and I enjoyed my work and I enjoyed medicine.

AM: And did the medical school include any kind of medical genetics training?

JB: No.

AM: Hopkins was becoming the center for medical genetics-

JB: -Yes, yes.

AM: - and that did not go down the beltway at all?

JB: No it did not go down the beltway at all - none whatsoever.

AM: Ok, and you did your internship at Freedman's hospital?

JB: Yes.

AM: And is that the hospital affiliated with Howard University?

JB: Yes.

AM: And did that serve primarily the African-American community in the DC area?

JB: Yes, that's right. It was completely segregated. Those were the days of segregation. In fact I [phone rings] – excuse me.

[pause in recording]

AM: In this time, students who graduated from Howard University would usually practice in the D.C. area?

JB: Most of them. I would say more than half of our class [practiced] in DC and the rest went back to their hometowns to practice. And various specialties. They had a variety of specialties all over.

AM: And were all the medical students at Howard University African Americans?

JB: No, they were not. In fact, in my class – well, yes, almost. There was one white student, a very wonderful person. He is now a Professor Emeritus of Anesthesiology at Columbia - a very, very nice person. There were three other classmates who were [called] Negro then and are now passing for white. And they've never come back to alumni receptions. Our white classmate always came back. In fact, I saw him a couple years ago, [when] he came back. After I graduated, I would go to certain medical conferences, and when I'd see them [the doctors passing as white], they'd walk right past me and didn't want to speak. That happens. Later on, even more white students were accepted into Howard. I forgot how many now, but there are quite a few at the medical school.

AM: So segregation worked [only] one way?

JB: Yes.

AM: Could you have gone to another university within the DC area?

JB: Not in the DC area, no. I could not. In fact, it was segregated until 1954. The reason I remember it so very well is because I was in the Army then at Fitzsimons Army [Medical Center] Hospital [in Colorado]. I went to the Armed Forces Institute of Pathology[14] to do temporary duty for two months, so I lived there [in DC]. Just before I went there, segregation was abolished and you could go into the restaurants, movies. It was a completely different place, just as if nothing had ever happened. (laughs)

There is a very funny joke. It's the story about a black man. He was told, "Well, the restaurants are open and you can go." He said, "I'm not going. I'm not going." After about two weeks he said, "OK, now I'm ready." So he went down to the best

[14] The Armed Forces Institute of Pathology, a Federal facility for education and research in pathology, was founded in 1862 as the Army Medical Center. It is located on the grounds of the Walter Reed Army Medical Center in Washington, D.C. For more information, see: www.afip.org.

restaurant and said, "I want hog maws and chitlins[15]," --all kinds of things that a Negro would love. They said, "We don't have it." He says, "What's wrong with you? I waited two weeks. You knew I was coming." (laughs) There are lots of jokes about those things, which are not – I mean, they're sad, but in a way they were hilarious, too.

It was a very segregated city. After that time – in fact, the only thing [un-segregated] in Washington, D.C., during the time I lived there until I left, is you could go anywhere and sit anywhere on the buses. One didn't have to go to the back of the bus. But, if you went over to Virginia, right across the border, you'd have to go in the back of the bus. And I had a good time going over to Virginia, because I could sit in the front of the bus, and they'd make me get to the back of the bus. I just wanted to do it. (chuckles)

AM: Did you have any sense, or did you perceive that your education at Howard might be not as high quality as if you'd gone outside the DC area?

JB: No. We were brainwashed, in a way. They said, "When you leave this place, you'll be able to compete anywhere you want to go." That was their goal. We had excellent professors. Most of them had obtained their MDs and PhDs from white universities, at least three from the University of Chicago.

AM: And were there many females in your medical class?

JB: Let's see. Out of a class of about sixty-eight, there were about sixty males [and] about six females.

AM: Okay. Why did you look to Chicago for your residency, rather than staying in the area?

JB: You mean –

AM: You could have done your residency at Freedman's? Or no?

JB: Oh, yes. I just thought it would be nice to have a change, to get out of a so-called segregated area, and to look ahead. In Chicago, of course, you could go practically anywhere. But even so, there were places – pockets -- that you knew that you were not supposed to go into that area in Chicago in those days. But I wanted to get out of a segregated environment. And I did.

AM: What was it about pathology that was capturing your interest?

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[15] Hogs maws and chitlins, or chitterlings, pigs' stomach linings and intestines, are traditional ingredients of Chinese, Italian, Mexican, and Scottish cuisine, as well as in African-American soul food.

JB: I don't know. This man by the name of Webb was an excellent person, and I went to an autopsy, and I looked at surgical [procedures], and I began the internship and he saw that I had an interest in it. I think it was probably the man. He was such a very nice person, and we had a very nice rapport. I became fascinated by him and what he was doing.

AM: As your residency was winding down, what did you think you would be doing? Would you be a clinician? Would you be more of an academic?

JB: Well, as to that – yes. Under Dr. Hirsch, I did some research. It was not published. He was interested in atherosclerosis[16], and I used to work with rabbits and give them intravenous fat and look at their tissues. So I became interested in atherosclerosis, and that's one of the reasons why I elected to go to the Nutrition Laboratory, I became interested in nutrition. And so I did some work with them.

2. Army Service, McCarthy Era Investigation, Living in Iran, and Researching Favism

And in the army, at the Nutrition Laboratory, I did some experimental work. It was not published, but I actually had a year and a half of looking at tissues from North Korean prisoners of war. They supposedly had been starved and had malnutrition, and they were our prisoners [that is, members of the UN allied troops who fought in the Korean War, 1950-53]. *Supposedly* the reason why they were starved is that there were certain prisoners who were in charge, the cadre, and they said [to them], "Well, you are going to do what we say you will do." And if they didn't, they would starve them. All of a sudden, they tossed them over the prison wall, and they were dead, and I looked at the tissues, and so forth. I spent a year and a half, actually, studying the pathology of starvation and malnutrition, and I had some access to materials and things from Europe about problems with Jews in Germany. I wrote a very, very nice paper, and it was classified.

AM: Did you go to Korea to collect these samples?

JB: No, no.

AM: How did you get the samples?

JB: I got the samples there [at the Nutrition Lab].

[16] The hardening of arterial blood vessels, often from the buildup of cholesterol.

AM: So how much information did you have on these individuals? It seems to me that probably this day and age it would –

JB: There was hardly any information. Those who were dead, they just tossed them over the wall and there they were. All we knew is that they were prisoners of war, and they were dead. I studied this and compared it with malnutrition from samples from other parts of the world, and did a very nice analysis. But the Army decided it was classified because they thought that they would be accused of starving our prisoners. But it was absolutely fascinating.

I had a wonderful experience, actually, in the Army. It was very nice because it was 9-5, weekends were off, and I did nothing but research. All of a sudden, however, [at the] Nutrition Laboratory, all of the medical offices had to have top security clearance, for some reason. I have no idea why. We were called into the commanding general's office, and he said, "Officers," - he never called us doctors, but we were all medical reserve officers - he said, "You're going to have to have clearance."

One day our commanding officer looked at me, and he wouldn't look me straight in the eye, he said, "Captain Bowman, the head of Intelligence wants to talk to you." I thought to myself, “I wonder what he's going to dig [into] about this.” And I remembered that when I was in college at Howard University, there was something called the American Students Union[17], and I didn't know anything about it. They invited us to go to their meeting, and all of the students there were white. Well, that was unheard of in Washington, DC, and all of a sudden I realized that these were Communists who were trying to recruit us. I said, "Well, I won't have anything to do with them." I remembered that and I said, "Maybe they're going to talk about that." (laughs)

There were a lot of those things I knew of. My father-in-law was a good close friend of Paul Robeson[18], and of course Paul Robeson had many, many problems. But they were close friends, and they kept up their friendship. I said [to myself], "Maybe he's going to ask about him."

Then all of a sudden, I went into the office. The office was dark, and there was a secretary way over in the corner - trying to hide from me. They were taking recordings, and then they had put a big spotlight on me, and then he started. Well, I won't say the man's [name], I mean, I will not give his name. But he said, "Captain Bowman, did you

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[17] The ASU was a left-wing college student organization founded in the 1930s and investigated by the Dies Committee (associated with HUAC) for being suspected of dis-loyalty to the US government and communist sympathies.

[18] Paul Robeson (1898-1976) was an African-American singer, actor, athlete and lawyer who fought for an end to racism in the US and abroad. He was also active in colonial liberation movements. Due to his political activities and his friendship with socialist figures, Robeson was under intense scrutiny during the McCarthy era. See http://www.pbs.org/wnet/americanmasters/episodes/paul-robeson/about-the-actor/66/

know - and tell me all about 'John Jones.'" I won't give his real name. I said, "Aha, this is what they want." 'John Jones' was a very close friend -- had been a good friend of my father-in-law.

My father-in-law, at that time, was chairman of the Chicago Housing Authority, and he had to have FBI clearance himself in order to do [be chairman]. He would go to visit this friend, who was a very wealthy man. I won't mention the family because they're well known. And all of a sudden, he [my father-in-law] looked around and he said everybody there was a communist. There was [Earl R.] Browder[19] and other communists, and what have you. Finally, after years, he said, "What's going on? Every time you've invited me, these men are here. I can't [visit] because I'm always under investigation myself."

So I said, "Well, that was 'John Jones,'" and I told them about 'John Jones' and my father-in-law. They said, "What is his middle initial?" I said, "I don't know." The investigator said, "Don't be smart with me, Captain. I said, "All I know is it's 'John Jones.'" They said, "We're talking about 'John T. Jones.'" I said, "I do not know his middle initial." This went on for about fifteen minutes, back and forth, back and forth, and I was there for about two hours, just going back and forth.

Finally, he said, "Have you ever seen 'John Jones?'" I said, "No. If he walked in the room, I wouldn't know -- never [seen] a picture of him." He said, "Well, do you know anything?" I said, "Oh, I remember one thing about him is that when my wife and I were married, we had a lot of guests (we had about three hundred guests at our wedding). And all of a sudden [during the wedding reception] I asked what this big bowl was, and [my family] said, 'Oh, 'John Jones' gave this to us.'" And I said, "Aha!" He said, "I told you." I said, "No. The only reason I picked it out was because it was the most expensive present we had, so that's how I remember his name."

Finally, he said, "Well, we're going to have you come back next week and I want you to sign something, but you're not supposed to tell anybody about this interview." I said to myself, "You are absolutely a fool. I'm going to call my father-in-law right away!" [And tell him] that I am having problems because of my father-in-law's association. I called him up and told him what happened. He was horrified. He said, "That's crazy. I've been cleared. The head of the FBI is a close friend of mine. He was the president of a big hotel. I will have him -- he and I will come there and talk to them." When I went back there, I said to him, "I called my father-in-law." He said, "I told you not to do it." I said, "Look. My father-in-law is going to come and the former head of the FBI in Chicago is going to come, volunteer, and talk to you." I didn't hear anything more.

[19] Earl Browder (1891-1973) was a prominent American Communist and one-time leader of the Communist Party USA.

AM: Was this all part of the HUAC, the House Un-American Activities Commission[20] investigations?

JB: It was during those times, where everything was -- there was [Joseph R.] McCarthy[21], oh yes, it was a horrible time at that time. But I wasn't bothered, I said, "After all, I'm going to tell the truth." In fact, when he came back, there were so many errors in the transcript, and I said, "I'm going to have to get back with him for my two hours." What I did, I checked every comma, period, misspelling. I refused to sign it, and I had to come back again and again. I said finally, "I will sign it." (laughs)

AM: And this was in Denver?

JB: That was in Denver, yes. Denver is absolutely a wonderful, wonderful place to live. My wife taught at Colorado Women's College there. She substituted there while I was there, and she had a wonderful time - weekends going to the mountains and everything. It was nice. It was very nice. I didn't have to do any army duty, no formation, no nothing.

AM: Did you have to go through boot camp?

JB: No. The reason why I didn't have to go to boot camp is because I had already -- I forgot to tell you -- I had ROTC [Reserve Officers' Training Corp] at Howard University, so I had ROTC training and all of that, so they excused me from boot camp, which was very nice, very nice.

AM: So most of the students you graduated with as an undergraduate who didn't go on to a professional school, like medical school, and who would have been inducted as a private, but had medical training…

JB: Yes.

AM: Did they end up going on to serve? When you graduated, it was the end of World War II?

JB: Yes.

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[20] HUAC, the House Un-American Activities Committee was created in 1938 to “investigate alleged disloyalty and subversive activities”, usually of those individuals suspected of harboring Communist sympathies. The committee flourished in the post-WWII atmosphere of fear caused by the cold war and US-Soviet hostility. Richard Nixon was perhaps its most famous member. After its heyday under Senator J. McCarthy in the early 1950s, the Committee fell out of favor because of its questionable tactics and was eventually disbanded in 1975.

[21] Senator Joseph R. McCarthy (1908-1957) was best known for his unsubstantiated claims of knowledge of covert communists and Soviet spies infiltrating the US. McCarthy eventually lost his credibility and was censured by the Senate in 1954.

AM: So some of the students you were in ROTC with did actually go on to serve in the service?

JB: Yes. In fact, a very prominent person, who actually was the first senator after slavery was Edward [W.] Brooke [III][22], was two years ahead of me at college. He went overseas and he fought with the 97th [Infantry] Division in Italy, and he came back with an Italian wife. He's a very close friend, a very nice person. He's still alive. He divorced his wife and he has another wife now, but he's very wealthy. He was a senator from Massachusetts, Eddie Brooke.

Quite a few of them went overseas. A very sad thing is that in medical school, any student who flunked out of medical school who were enrolled in the army were sent immediately overseas. One of my colleagues, who was a very nice person, he flunked out and six months later he was dead.

AM: Did that keep you motivated in medical school, or did you just have kind of a natural ability to do well in medicine?

JB: I mean, I liked it. That is, I enjoyed it, one of those things. Of course, that would motivate anybody, if you flunked out of school, they'd send you more than likely overseas. (laughs) And I had no desire to do that.

AM: Did you have the same opportunities -- I know that other people I have interviewed, other male geneticists I've interviewed, they went to medical school and the army paid for their training. Did you have the same opportunities then, because you were a private while you were in medical school?

JB: The army paid for my training, and then afterwards -- when we graduated at that time, we went off and -- but I didn't have to go do anything else after that. In fact, when I was in the army and finished my duties at the Nutrition Laboratory, I was invited to be in the regular army because I had all my boards and everything else. Two or three officers came to talk to me and they said, "Well, you know, the army's different now. One of these days you could be a general." I said, "But I could also be dead, too." (laughs) They didn't like that very much. They said, "When you leave -- you can get in the reserves." I said, "No time in the reserves, nothing. This is it." I did my army days.

AM: What had changed, because after medical school you went into service, and then you were dismissed, but then you were called back up again? What had changed that they now wanted African American Medical Corps people?

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[22] Edward W. Brooke III was elected to the Senate in 1966, making him the first African American senator since Reconstruction. To learn more, visit the website at: http://baic.house.gov/member-profiles/profile.html?intID=125

JB: I don't know. They were encouraging particularly those who had a specialty. I was very fortunate because many of my colleagues went off to the Korean War as medical officers. One colleague of mine said it was horrible. He said, "When I volunteered for the Navy, I forgot that in the Navy, one is often attached to the Marines." He said, "But I thought I was smart by ducking fighting." (laughs) He thought he would be aboard a ship. There were quite a few friends who elected to stay in and did really well in the armed forces. But I had none of that. I didn't like the army anyway.

resume

AM: When your duty was coming to an end and your colleagues were encouraging you to become a lifetime member of the U.S. Army, what were you thinking you wanted to do?

JB: Well, my wife and I could not make a decision. I could come back to Provident Hospital as Chairman of the Department of Pathology, but my wife and I decided that we were not going to go back to anything that smacked of segregation. We decided to do something else. So we said, "Look. Why don't we find a position overseas, out of the country?" There were opportunities in Africa and the Far East. One day I went to a conference in Washington on geographic pathology, which I was interested in because of my work on pathology of starvation and malnutrition, and became fascinated with nutritional pathology and geographic pathology.

When I was at a conference, the last day of the meeting -- and this was how my life changed completely -- a friend of mine who was head of the geographic pathology at the Armed Forces Institute of Pathology, when I was on temporary duty there, he said, "Jimmy, I heard about an opening in Iran in pathology. A wealthy Iranian has built a hospital and he wants Americans and Iranians to open this hospital." He gave me the name, he said it was the Iran Foundation [Inc. for Advancement of Health and Education in Iran], which is based in New York. Some of the members of the Board were [Charles A.] Janeway from Harvard [Medical School], [Allen O.] Whipple from Columbia [College of Physicians and Surgeons], and [Nicholas J.] Eastman from Johns Hopkins [University School of Medicine]. I said, “That sounds interesting”.

I told my wife about the opportunity. She said, "Well, let's take a chance. Let's see." So I wrote a letter to the Board and I got a letter a week later inviting me, and my wife, naturally, for an interview in New York. So we went to New York to the board meeting. They had a big banquet. I noticed that my wife and I we were being circulated from one board member to another (they were examining my wife also). (laughs). They said this new hospital had been opened and how would you like to go and be Chairman of the Department of Pathology. And my wife and I agreed to do it. We took a chance. It was wonderful.

At that time we were sort of disaffected with the United States and the segregation and the Un-American Activities [HUAC]. We said, "Who knows? Maybe we won't come back. We don't know." We were recently married, so we took a chance. It's the best thing we ever did because it changed our life, completely.

AM: When you were being circulated around in New York, were these mostly Iranians, or were they Americans, or --

JB: No, they were Americans. They were all -- except of the Head of the Iran Foundation was Iranian, Mr. Ameri. But all the rest of the board were Americans, and all of them were professors from major institutes, and they were on the board. Most of them had had foreign experience before, many in China and places like that. Was it Peking Union Medical [College] in China? A couple had been there. Eastman and Charles Janeway were very marvelous professors, and international to the hilt, very nice. Many of the members of the board came to Iran for a visit periodically. It was a wonderful group of people.

AM: Now, could it have been as easily any other country, or was it -- how much was serendipity a role in -- ?

JB: Well, we wanted to go someplace, and there was an opportunity with the Public Health Service in Liberia. A friend of ours had been Ambassador to Liberia. But we heard about Liberian problems. I don't think too much about that. There were other opportunities that we looked at, but this was the one we said we wanted to do, because there was no affiliation with the U.S. government whatsoever. I didn't want to be a government person, and I'm not a missionary, not in the way -- in fact, I'm not religious at all.

AM: We're going to get to that question.

JB: Yes, you will ask that question. No, I'm not religious at all.

AM: Were your parents raised --

JB: Well, I grew up as a Baptist. I was baptized in the Baptist Church. And after a while I looked at religions and their history. I always liked history. And I didn't like what I read about the history of any of the major religions, particularly Christianity, and what have you. And Judaism, I said no, and Islam, no. So when I came to Chicago, my wife used to go occasionally to the Episcopal Church, occasionally. And after we got married, her mother said, "Well, you're heathen. I want to take you to the Episcopal Church." I said, "Well, I'll go." I said I'd look at it. We went to the Episcopal Church and they had communion. They brought out this wine in this big thing, and everybody drank out of the same cup. (laughs) I said, "No, that's not for me." I said "What are you doing?" I'd

never seen (as a Baptist) anybody do that. (laughs) That was it. No, in fact, my wife and I are not religious at all. My daughter also is not.

AM: You didn't encourage her?

JB: No. We wanted her to be independent. Our daughter -- I'm getting ahead of myself -- was born in Iran. She went to the Church of England Sunday school. We let her decide, what she's going to do one day. Eventually -- I'm getting ahead of myself now. I will tell you all about that. I was particularly disaffected with missionaries in Iran.

AM: Let me pause the tape. [pause]

JB: Yes.

AM: What kind of language skills did you have?

JB: Oh, before I went there? Well, when I went there, I studied French, Spanish, and German. I was not fluent in other languages, but like most Americans I could read [other languages]. Of course the language [spoken there was] Farsi.

This is called the Nemazee Hospital in Shiraz, Iran. At that time it was a two-hundred-and-fifty bed hospital. There was one Iranian who was head of radiology, and the rest of us were Americans. There were no British. The rest of us were Americans from various universities in the United States; from Columbia, Harvard, and places like that. I was head of pathology. We had just a wonderful experience.

We arrived in Iran like babes, innocent. (laughs) We arrived in Tehran. We were supposed to be met at Tehran by members of the Iran Foundation in Iran, at the airport. For some reason, they missed us, they were not there. We looked around. Where to go? We knew where we had to go and we knew that the Nemazee building -- there was a very wealthy man had a building there, and his offices were in Tehran. Finally, a nice American saw us and said, "Where are you going?" So we told him where we were going. He was there visiting, and he had a car, and he took us to the Iran Foundation office in Tehran, where my wife and I were greeted. We were invited the next day to the home of Mohammad Nemazee, who started the hospital. He was a very wealthy Iranian. He made his money in China, for some reason, in the export-import business.

My wife was told before she went there that the ladies had to be covered up, their arms - their faces didn't have to be covered. So we went to a party at his house, and the Iranian ladies, all of them were completely exposed. (chuckles) And my wife was

sitting there in long sleeves. Those were the days of the Shah[23], so you could dress any way you wanted to.

So, we were greeted there. Then we stayed in Tehran a couple of days and then went on to Shiraz. It was a nice compound, a large compound with individual houses for the staff. We stayed on the compound. It was a huge, beautiful hospital. Our house was not ready, so we stayed in a huge guest house. Whenever the Shah came to visit, he would stay in that house. So we stayed for a couple of weeks until our house was ready. Then we went to our building. It was very well appointed. There were earthquakes intermittently, but our house was supposedly earthquake-proof. You could hear and feel the quakes.

I had a wonderful, wonderful time. I saw diseases that I had not seen before. I saw smallpox, brucellosis[24], rabies, and just all sorts of things that I had read about. One day a colleague of mine, a pediatrician, and I were walking down the hall, and all of a sudden there was a large family with a little baby in their arms, a little girl. The woman came and said, "My baby's sick, my baby's sick, my baby's sick." I was with the pediatrician, we went together. We looked at that child, and the child was very pale, had yellow skin, and the eyes were yellow, and we knew that this child was in deep trouble. We didn't know what it was. We were looking at favism[25] and didn't know it. I did a quick hemoglobin [test]. The hemoglobin was about four grams percent, the child was in shock, and I instituted a transfusion *without* cross-match.

[G. C.] Campbell and I sat beside this child. Then all of a sudden, after about an hour, the child roused up, started crying, wanted to jump up and down in the crib. She was about two years old. I looked at Campbell and said, "What happened?" The mother said, "Maybe she's fine, maybe I can take her home." I said, "Let's wait another couple of days." Another couple of days [went by], she was fine. And as the child went out, Campbell said, "I wonder what was that."

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[23] Mohammad Reza Shah Pahlavi ruled Iran from 1941-1979. During his reign, the shah promoted western culture and was seen heavily influenced by western powers, which made him unpopular among many Iranians. He was ousted from power during the Iranian Revolution and replaced by the Ayatollah Khomeini and his conservative religious rule. For more information, visit the website at: http://libcom.org/history/1978-1979-the-iranian-revolution

[24] brucellosis is a disease caused by a parasitic bacteria usually found in domestic animals. Humans contract the disease most often through contact with contaminated milk. Notable symptoms include rising and falling fevers and mental depression.

[25] favism, aka G6PD Deficiency, is a hereditary enzyme deficiency. It is caused by a genetic abnormality in the activity of an erythrocyte (red blood cell) enzyme. Its symptoms include yellowish skin, pallor, weak rapid pulse, and shallow breathing. The symptoms are often brought on by consumption of fava beans, thus the name favism. For more information visit: http://www.g6pd.org/favism/english/index.mvc?pgid=intro

Then we saw many patients that spring with the same thing, and we looked around, we looked it up in books. He said, "Well, maybe it's well water with nitrites." Then I happened to go to the marketplace, and I saw some beans. I remember seeing these beans. They were fava beans, I didn't recognize them. I said, "Ah, these must be fava beans." And I made the association that fava beans - maybe that was the cause. Another child came in, and we asked of the mother, "What did the child eat?" She said, "She had some beans like this." "Aha - it is favism," [I said].

After looking a couple of months of looking around, I went home to our maid, who was taking care -- my daughter was born by that time. I said, "You see these beans, they're dangerous for the child." She said, "Yes, when I was pregnant my mother told me, 'Never give these beans to your child, otherwise she'll get pale yellow and die.'" She knew it! And I should have asked her what it was. (laughs)

At the same time, I was reading about work that was being done at the University of Chicago, and I looked in the literature. In Italy and in Israel, they were describing favism. At the University of Chicago, there was the United States Malarial Research Unit, headed by Dr Alf [S.] Alving, and I wrote him about favism. Dr Paul [E.] Carson had written a paper about glucose-6-phosphate dehydrogenase deficiency and its association with primiquine[26]. We would write back and forth, back and forth about this.

There was a colleague [Deryck G. Walker] who was a biochemist, a British biochemist, we started looking at favism, and we decided to do surveys in Iran for glucose-6-phosphate dehydrogenase deficiency. It was absolutely fascinating. Then we started growing fava beans from the pistils and isolated extracts from them. We said, "Aha! Maybe we could use this, the extract of the fava bean, to test for glucose-6-phosphate dehydrogenase deficiency?"

By that time it was around 1960. There was the International Congress of Hematology [The Eighth Biennial Congress of the International Society of Hematology] in Japan. I wrote a paper and sent it there. I said to my wife, "I'm going to give this paper at the International Congress of Hematology. It would be nice to do that." So I gave this paper about pollens and pistils and fava beans and how we'd used the extract and tested it. There was an elderly gentleman in the audience, and he started asking very good questions. Then he came up and said, "I'm Professor Alf Alving. I've been corresponding with you from the University of Chicago. I've been wanting to meet you all this time." Then he asked a question in the audience. He said, "But the Israelis tried to do what you did, and they failed. Why?" I said, "Ask the Israelis." (chuckles) But I

[26] Primiquine: a synthetic antimalarial drug. Primaquine should not be administered to anyone with glucose-6-phosphate dehydrogenase deficiency because there can be a severe hemolytic anemic reaction, i.e. the abnormal breakdown of red blood cells in the patient.

knew what they'd done. They'd used a concentrated extract from fava beans, which would agglutinate all the erythrocytes and you couldn't test them. So I diluted them.

He said, "Look, I want to take you to dinner." He took me to dinner. Then after that we went to the bar and had a couple of drinks. Finally, he said, "You've been away too long. If you ever come back to the United States, I want you to look me up." I said, "Okay, fine." This was around 1960. I said, "All right. I may one day do that."

It was one of those chance things, because at that time we started going all around the country testing for glucose-6-phosphate dehydrogenase deficiency. We looked at Zoroastrians[27] in particular, because they're original Iranians, and we said, "Aha!" They were different. They did not have G6PD deficiency. All the other groups -- except the Armenians did not have G6PD deficiency -- all of the other groups, we found a high prevalence of G6PD deficiency.

So I started writing a paper about this. We looked at haptoglobin[28], other proteins, and what have you. We went all around the country getting samples from various populations. At the time that we were going around, obviously we knew that the so-called SAVAK[29] -- the SAVAK are the intelligence agents there. One day my technician who had been working with me, he said, "The SAVAK wants to talk to you because you want to go to the Mamasani[30] tribe, and [the government] does not like people going there." I said, "Okay, fine, I don't mind being interrogated. I've been interrogated before." (laughs)

But it was quite different. We walked in this office and this man was very well dressed, impeccably dressed, he spoke perfect English, and he was the head of SAVAK in Shiraz. He started, "Now, Dr. Bowman, why do you want to go to the Mamasani?" I told him what I wanted to do, how important it was. He said yes and listened to me. Every now and then a rough-looking man would walk in and look at us and then walk out. Every now and then he would walk in and walk out. After about an hour and a half of interrogation, he said, "Well, Dr. Bowman, we'll be very pleased to have you go to the Mamasani." As I left, I said you know what - I've been in this man's presence for an hour and a half, and I think he knows more about me than I know about myself. It wasn't an interrogation, it was just gentle, just bringing little things up. He was sizing me up,

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[27] Zoroastrianism is the religion of ancient Persia. It was founded by Zarathustra and is one of the oldest religions in the world, pre-dating Islam. Zoroastrian communities can still be found in Iran and in India. For more information, visit the following website: http://www.religionfacts.com/zoroastrianism/index.htm

[28] Haptoglobin is a protein produced by the liver. Low amounts of it in an individual may be caused by G6PD deficiency.

[29] SAVAK is a contraction of the Farsi words for security and information organization.

[30] Mamasani are traditionally a nomadic people group who live in mid-western Iran.

sizing me up, sizing me up. It was so beautifully done. It was very professional, very professional.

Two days later we went to the Mamasani tribe to get blood. The Khan of the tribe was a brother of a good friend of ours at the hospital, who was a technician. So we were there, and we had dinner. And one of his [the Khan's] men came up and started whispering to me, "Dr. Bowman, you're in this country. There's no democracy here like in the United States. We have a king and he's absolutely horrible." He was saying all kinds of nasty things about the Shah. I looked at him and said, "I'm not here to talk about politics, I am scientist — that's not my business. I'm here to study an enzyme deficiency." He kept bugging me the whole evening, trying all kinds of things. I said, "No I'm not interested."

Two days later I was at the airport, and this very rough man who came in every now and then [during the interrogation], he was at the airport. He smiled, walked up to me, shook my hand and said, "Dr. Bowman, you can go anywhere you want to go." (laughs) He was the spy. I laughed and I said that was wonderful. They were watching every step, and I wanted them to do that because it's much safer.

In fact, a month later we went to the Zoroastrians in Yazd to look at the original [Iranians], the original ones there, and to get blood from the Zoroastrians. They were very nice. And after a while we were getting some [blood] from students at the high school, and the head of the Zoroastrian group said it's okay. We went out to lunch, and all of a sudden we heard -- the mothers were going to this school saying, "The American man is getting blood from our kids to give blood for the American army." (laughs) I said, "Look, this is it." But the head of the Zoroastrians said, "Don't panic." I said, "We're finished, we're finished here."

By that time it was very light and we started back to Shiraz. In the middle of the night we got lost in the desert. There was no road really, hardly - it was just dirt. All of a sudden we saw a small village with a hut there, and we went to ask directions. All of a sudden a man came out of the village. He said, "Ah, that's Dr. Bowman." And he showed us the way to get to Shiraz. They were watching us. It was just wonderful! (laughs) It was wonderful. I really felt safe - because things happen.

AM: Was the medical center at Shiraz new when you got there?

JB: No. It had been there. Shiraz, the medical center, had been there for a long time. There was a medical center in Isfahan and Shiraz, Tehran, and I think that was it at that time. While I was head of pathology at the Nemazee Hospital, the first year or two there was no connection with the medical school, because the head of the medical school and the head of the hospital didn't like each other. They were rivals. The head pathologist there, who was a German pathologist, who was head of pathology, he and I

became very close friends, and I learned about his Nazi background. But he was a very nice person and all of that. Finally, he left and they asked me to be chairman of the Department of Pathology. So I became chairman and did the work at the hospital, and doing research going all around the country and getting blood and what have you. So I had a wonderful time as the professor chairman of the department in the last year that I was there.

It was a wonderful. My daughter grew up in a large hospital compound. She had a maid there. There were other children, there were other Iranians and there was an Italian family and an American family. The kids -- it was a wonderful life for them. The city was very nice. There were no problems whatsoever. There was no television, of course, it was early, but we heard the news on BBC, Voice of America, and we heard about the problems that were going on in the United States and about Little Rock, Arkansas, the kids trying to walk in there[31], and we wondered what was going on. That's all we could hear, all over the world. In Russian, they said, "Little Rock, Little Rock, Little Rock." And we couldn't understand anything else but Little Rock, Little Rock, Little Rock, Little Rock. They were talking about what was going on in the United States. Then finally we learned what was going on in Little Rock through the shortwave [radio].

It was nice place to live, but we decided eventually we would leave. One of the reasons why we wanted to leave was because our daughter was a redhead, very light, and we started talking about Negroes. She said, "What's a Negro?" We tried to explain to her what a Negro was, and she looked around at the Iranians and said, "Are they Negroes?" We said, "No." She's very smart, she said, "Well, you know, but my skin is very, very light and I have reddish hair, but I'm a Negro, and why aren't they Negro?" Finally she said, "Well, who's the Shah of the United States?" We said, "There's no Shah of the United States."

My mother-in-law came to visit us three times while we were there, and the last time she was there, we were walking down the street and all of a sudden she stopped and said, "Look, look, look, look!" I said, "What are you looking at?" And there was a child with sores all over his face, with flies all over his face, eating a -- we didn't see it. We *did not* see the child. We walked past the child and we didn't see it. And my wife and I said, "It's time for us to leave." So we said, "Well, we'll go back."

At that time my colleague, my pediatrician colleague, had been back in the United States, back at Harvard Medical School at Children's Hospital. His boss was Louis K.

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[31] Little Rock Central High School was one of the most important sites of de-segregation during the civil rights movement. In 1957, nine black students integrated into the school amidst violent opposition and protest. For more information, visit the website at: http://www.centralhigh57.org/

Diamond[32], who was professor chairman of hematology there. We had sent our fava beans to him to look at our fava beans to find out what they were, and what have you, and we had corresponded. One day the head of the hospital said, "Jim Bowman, there's a Louis Diamond who's coming here, and he's going to be at the airport, and I'd like to go to meet him but I can't do it. Would you like to meet him and his wife?" My wife said, "Of course, we'll do it."

We went to the airport to pick up Louis Diamond and his wife. We'd been corresponding through all these years, too, like Alf Alving at the University of Chicago. He said they were going to stay at some such-and-such hotel. My wife and I said, "I don't think you want to stay at that hotel." [We offered them to stay at our home.] He said, "We've traveled all over the world," and my wife said, "Well, I don't think you've seen anything like this." He said, "Oh, no - of course [we have]." So we took them to their hotel. Half an hour later, they called us up and said, "Dr. Bowman," he said, "we'd like to take you up on your offer." (laughs)

AM: Where was the hotel?

JB: It was in Shiraz. It was the best hotel then. Now they have wonderful hotels. It was there for tourists, but the toilets were stopped up, and all sorts of things like that. So they stayed with us for two weeks. We went out to various tribes, local tribes. He wanted to look at what was going on. We went with him out there. I'll never forget - we went out to one place to obtain blood. We were driving out there [with one of the missionary doctors]. And all of a sudden the guy started clapping and yelling, singing songs. They were missionaries. He was a doctor, the head of the missionary -- of the English hospital there. And all of a sudden we got into this large village, and we said, "We're going to go to draw blood." He said, "Well, we've got time [to eat lunch first]." And there were people waiting and waiting for us. And the man who was there, said, "Well, we have to have lunch first." I said, "But these people are standing out in the sun. We don't have to eat lunch." Lou Diamond was with us, and he said, "This is weird, isn't it?" This missionary doctor, people would line up and he'd say, "Ah, you've got malaria. Give him malaria pills." And "[You've got] fever. Give him this," *without* examining them. Lou Diamond was horrified and I was, too. We said, "We'll never go on that trip again."

But anyway, the Diamonds left. Then, just before Dr. Diamond left, he said, "You know, Jim Bowman, you've been here too long. And you've been doing all this work on genetics and writing papers, and we know about what you're doing at Harvard and at the University of Chicago, and we've read your papers. You're doing all this practically

[32] Louis K. Diamond (1902-1999) was a Russian-born, New York-raised pediatric hematologist who is best known for his research of erythroblastosis fetalis and thalassemia.

alone. Now, there's a Galton Laboratory[33] at University College London, and Lionel [S.] Penrose[34] is a good friend of ours. I'm going to ask, if you would like to, to apply for an NIH [National Institutes of Health] fellowship to do a year or two of genetics at the Galton Laboratory."

At that time, except [James V.] Neel[35] at [University of] Michigan and Jim [James F.] Crow[36] at [University of] Wisconsin, and also at [John] Hopkins [University], those were the only places to do human genetics - the only places. But he said that the best place was the Galton Laboratory and Penrose and to go there. So he sent an application, and I was accepted at University College London to study genetics. And I'd been writing about it, so this was absolutely wonderful. But I'll stop there because I'm going too long. Had just a wonderful time with Penrose and his family and my colleagues there. It was just a wonderful opportunity. So after writing about genetics and doing it, I began to really study it. (laughs)

AM: I really want to pursue this a lot more, and maybe we can pick up tomorrow with that. Just one last question before we leave Iran.

JB: We went back there several times, too - since we left.

AM: I find it striking that you say you weren't -- when this guy was whispering in your ear in the village that you mentioned, "I'm just here, I'm a scientist and not involved in politics." Yet it seems like, in many ways, you've been involved -- when the officer was interrogating you in Denver about your affiliation with -- obviously, with segregation, your life has always been, it seems to me, politicized.

JB: Yes.

AM: And you're living in Iran at a time where clearly -- I mean, we know the history of Iran because of the Shah and the involvement of Americans and the CIA [Central Intelligence Agency] during this period of time. When you went to Iran, how aware were

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[33] The Galton Laboratory was established in 1904 and became one of the most important and influential centers of research in the relatively young field of human genetics. Imminent geneticists like Lionel Penrose and J. B. S. Haldane led the laboratory and were instrumental in training many important geneticists.

[34] Lionel S. Penrose (1898-1972) was a psychiatrist, mathematician, and one of the fathers of the field of human genetics. He is perhaps best known for his research of the genetics of mental retardation.

[35] James V. Neel (1915-2000) was an imminent human geneticist perhaps best known for his work in sickle cell anemia, genetic mutation, especially that caused by radiation.

[36] James F. Crow, professor emeritus at University of Wisconsin-Madison, is perhaps best known for his legacy as a teacher of genetics. He penned several foundational textbooks in the field of human genetics, including one written with his colleague Motoo Kimura.

you of how politicized the Middle East was becoming, particularly Iran and Cold War politics?[37]

JB: When we went there, we went in 1955, and that was two years after [Mohammad] Mossadegh. And you know about the involvement of the CIA. In fact, the first two weeks we were there, the Iranians told us all about Mossadegh and the CIA involvement and [Kermit] Roosevelt [Jr.][38], and it never was in the newspapers in the United States. It did not come out until years later, the involvement of the CIA with him. The Iranians knew about it. It was a top secret to Americans but not to Iranians. That's a fascinating thing in the Middle East, there are no secrets. Everybody knows everything. Before they happen, they know. I can tell you about an experience in Beirut and things like that all over the Middle East.

As far as the involvement of the CIA, we learned about that later. But Mossadegh was a hero. When we lived there, we met the Shahanshah [Mohammad Reza Pahlavi] many times. He came to the hospital because this was a showplace. And we met [Muhammad] Ayub Khan[39] from Pakistan, we met [Jawaharlal] Nehru[40], we met the Queen of England and her consort, we met Hussein [bin Talal][41] of Jordan – they all came to the hospital. They had events for them and Americans were invited. It was actually quite spectacular.

But as far as the CIA, there was a US Army contingent there they called a medical advisory group. There were Americans. They were very nice and they were advising the Iranian Army - they were *training* the Iranian Army. But we were not aware of politics or anything else. Everything was open. Even though the Shah was there, we didn't have a feeling about the Shahanshah. But we did learn that many of my friends were eventually executed. The head of the Mamasani tribe that we went to, years later he was executed because he waylaid the Shah's soldiers when they came into his territory.

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[37] Mohammad Mossadegh was elected prime minister of Iran in 1951 and stayed in office until 1953 when he was removed by CIA-backed forces. The increasingly unpopular Shah maintained his throne through the support of US government. Mossadegh, in an attempt to free Iran from what many saw as an exploitative remnant of British colonialism, attempted to nationalize Iran's oil supply, previously controlled by the British. The CIA covertly campaigned to oust Mossadegh from office, perhaps motivated by fears that Mossadegh would side with communist Soviet Union, and successfully executed its plans in 1953. Afterwards, the Shah had Mossadegh tried for treason. Mossadegh was convicted and imprisoned for life.

[38] Kermit Roosevelt Jr. (1916-2000) was the head of the CIA's covert operation to overthrow Iran's prime minister Mossadegh. He was also the grandson of president Theodore Roosevelt.

[39] Muhammad Ayub Khan (1907–1974) was the second president of Pakistan. As commander-in-chief of the army, Khan led a military coup, ousting then-president Iskander Mirza.

[40] Jawaharlal Nehru was the first prime minister of India from 1947-1964 and also deeply involved with the Independence movement led by Gandhi.

[41] Hussein bin Talal (1935-1999) was the long-reigning king of Jordan.

It was a small community, and we went into town all the time. We had good friends in town. But there was no vision of a police state or anything like that. Everybody was free, and a lot of people were very open and would talk about the Shahanshah and say nasty things about him. But I never said anything. If they said [anything] to me, I said, "I don't know anything about the Shah."

AM: You leave in '61?

JB: I left in '61.

AM: And [Ayatollah Seyyed Ruhollah] Khomeini[42] returned from exile several years later?

JB: Well, he came quite a few later. We went back several times, and we were there in '78, a year before the revolution. Our daughter was with us. We went back to show her where she was born. When we went back in '78 -- and I'm jumping ahead of myself because you asked the question -- my wife and I went to Shiraz. We looked around, and we learned that there were twenty-five thousand Americans in that area. There was a helicopter plant building helicopters. My wife and I said, "There's just too many Americans here." We could sense there was going to be trouble. There were too many Americans in there - something's going to happen.

AM: And that wasn't true in the beginning, in the early 60s?

JB: Oh, no. There was nothing. But we felt it when we went back. We went back several times. We went back in '68 and we went back around '72 and then in '78. And more recently. The next time we'll talk about that. But, no, it was quite peaceful. Mossadegh was under house arrest. But I'll never forget one time -- when you mentioned Mossadegh -- his son, who is an obstetrician/gynecologist, came to Shiraz to give a lecture, and we went to his lecture. As he walked in -- this was under the Shahanshah now -- as he walked in to start his lecture, all of the students stood up and cheered him. We knew that SAVAK was everywhere, and what could they do? All of them, cheering for about five minutes before he could talk, before he could start. He bowed and bowed. Then all through his lecture, they would stand up and cheer, and this was their reaction against the Shah. It was so beautifully done. (laughs)

The students were absolutely fascinating. I'll have to tell you more about them, too. They were very nice. Many of my former students are in California. The professor of anesthesiology at the University of Chicago is one of my former students. One of the [professors of] radiology is one of my former students - I'll tell about him. And many,

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[42] Ayatollah Seyyed Ruhollah Khomeini was the theocratic leader of Iran after the overthrow of the Shah, Pahlavi.

many, many friends in California, and in New York, are my former students, who are professors all over.

AM: Were they Iranian students that you were teaching or international students?

JB: Yeah. They were all Iranians. There were no international students in Shiraz, they were all Iranians. They left just before or after the revolution, and now they're professors all over the place. When I go to reunions, it's wonderful to see my -- now, some of my former students are still in Iran, too, are still there. They're very, very nice. One of the last times we were there, one of my former students, who is head of pathology now at Shiraz in the medical school, he said, "Once I was walking down the street. This old man came up to me, and he said, "You're one of those smart professors." He said, "What do you mean?" "You're one of those smart professors. When you were saying 'Death to the Shah,' we'd listen to you. And now look what you've done to us!" And he walked away. He said it was so sad. [The old man said,] "You're the one that we followed. You said, 'Death to the Shah.' It was much better when the Shah was here than now." This was just a year ago. I've rambled on. When you ask a question, I can't stop (laughs).

AM: Okay. We'll pick up tomorrow then.

JB: All right. We'll pick up tomorrow.

Session II - June 27, 2006

3. Leaving Iran

AM: This is the 27th of June 2006, and I'm with James Bowman at his home in Chicago to conduct his oral history interview for the UCLA Human Genetics Oral History Project. And I'm Andrea Maestrejuan.

I'd like to start off going back a little bit. Tell me a little bit about -- this is before you went to Iran. But, coming to Chicago, you mentioned you were the first African American to walk through the doors, but you were also at Provident Hospital, which is in the South Side. Was the South Side of Chicago as it is now, which is a primarily African American community, or was it a bit different?

JB: South Side was practically an African American community. Well, it all depends on what part you're in. There was sort of a division. Most blacks lived east of Cottage Grove [Avenue], and very few blacks ventured past there. In fact, I don't think anybody owned houses or anything like that. Then later on, there was an infiltration into Cottage Grove. Some wealthy blacks built or bought condominiums -- no, it was rental first. It was very, very bad, because even though they were the owners, most of them were slum landlords. One of the major ones – I shouldn't mention the person's name - his

daughter was a very famous person, and he was a big landlord. But eventually things changed and movement of blacks to the lake [occurred]. But a lot of those things happened before we left. When we came back after 7 years being away things had changed completely.

AM: We'll get back to when you returned to Chicago. So you had lived and had grown up and spent most of your life in the D.C. area, which was overtly segregationist. How was Chicago different or similar to that?

JB: It was somewhat -- it was different. You could go to the movie houses and the restaurants and the theater, and what have you. But most of the black community lived in what is called Bronzeville, and there are large numbers still there. But that area is now also being changed considerably. There's a large number of middle-class people who have purchased there.

One of the main places to live was called Michigan Boulevard Garden Apartments, which was developed by Julius Rosenwald. It was about five hundred apartments, and now it's closed completely. Barbara's father, Robert Taylor, was hired by Rosenwald to manage the apartments.

There was a large, large contingent in Chicago, and there still is a large contingent. But now, blacks are spread all over the city, and a large number have moved to the suburbs. It's quite different.

AM: You had mentioned that you felt your colleagues, faculty members and your fellow doctors at the hospitals that you worked at were very nice and easy to work with. What about the patients that you saw?

JB: I was in pathology, I didn't see any patients. They were all dead. (laughs)

AM: You just saw parts of patients (laughs). Okay. Then to jump a little bit forward now, because we'll get back to you returning to Chicago, how was the medical facility at Shiraz different from other medical facilities in Iran? Do you have a sense that because of this international component of the faculty it was different, or the same, or --

JB: Oh, well, it changed completely. When we first went there, the French were sort of in control in the Tehran area. It was mostly French. We lived in Shiraz, which at one time the British were in control of, in the early days of this century. But then American's started coming in. But the medical school which we sort of redeveloped became sort of a challenge to the University of Tehran, which was one of the preeminent places. Everything that was taught in Shiraz we taught in English. In the University of Tehran, the lectures were in Farsi, and many of the students were at a disadvantage because they did not have access to the literature, and many of the books that they read were

translations from Farsi by professors. But in Shiraz, we turned that around completely and everything was done in English, and the literature was there, and what have you. It was a mixture of Iranians and Americans and some British in Shiraz, at the university. So we sort of turned it around.

It still is an excellent university. When we were there just a year and a half ago, we met some wonderful residents and students, and what have you, and they all spoke English, and they still do that. They have access to the world – that is to the Internet. They can get any article they want through computers anywhere they want. So everything is very good there. It's an excellent place.

AM: I think we talked about this a little bit off tape yesterday. The faculty was British, American, and Iranian. What about the students? Were there international students there?

JB: No, all Iranian.

AM: Were you training these students to become clinicians and practice within their own communities within Iran, or were they being trained for academic medicine?

JB: It was both. Some of them wanted to -- in their community, many of them left to do postgraduate work in the United States in residence, and I sponsored many of them. One of the best students that I ever had - he as a very, very, very bright student. Visitors would come from abroad and have a conference, and he would always ask the questions that nobody else thought of. He's now a professor at the University of California at San Diego, and he's head of surgical pathology at the VA Hospital [La Jolla Veterans Affairs Medical Center]. So many of my former students are like that, from all over, and they did very well. We sponsored him to do a residency at Johns Hopkins. Then he eventually became chief resident of pathology at Memorial Cancer Hospital [Memorial Sloan-Kettering Cancer Center] in New York. He was a very, very, very bright student.

He left, as many of them did, just after the revolution. Many of them got appointments at major universities, including the University of Chicago, coming straight from Iran, having been trained there. And they got their specialties.

But many of my students did stay there. One of my students, he developed community health centers in the villages in which the students would go out to the villages and practice, and come back, and go back and forth. That still goes on in Shiraz.

AM: Okay. We left off with discussing briefly your research program at Shiraz, which then led you to the Galton Lab. But before we get to the Galton Lab and your work there, I just wanted to go back over -- at that time you were practicing and teaching

pathology in a very kind of traditional sense, and you were walking down a hallway, and a mother and a child -- so this case was presented to you by accident?

JB: Yes. It was strictly by accident. I was a director of laboratories. I did everything. I was in pathology anatomy and clinical laboratories. I was head of the blood bank and microbiology, sort of a general practitioner in pathology. It was fun. It was great because we saw all kinds of weird things. We saw this child, and this child had favism, which I mentioned before. We finally discovered what it was long after the child left the hospital.

AM: Was favism something that you came across in your medical training here in the United States?

JB: No, no, no. I'd never heard of it. I mean, other than just reading about it. Then when we started looking at it, we realized that favism was very common in Italy and in Greece and in Israel and Iran and the Arab countries. But favism is practically unheard of among Africans and African Americans who have glucose-6-phosphate dehydrogenase deficiency, because the variant is different, very different. And that's a very important clinical distinction, because if someone has G6PD deficiency, if they were to take primaquine[43], they would have terrific hemolysis[44], just like favism. But African Americans can take primaquine, though there's a drop in the hemoglobin for a while but it comes up even though it's in them because it's a different variant.

One of the things that we did in studies of glucose-6-phosphate dehydrogenase deficiency, recognizing an association between favism and the dangers of primaquine because we once said, "Aha!" Because we didn't know the difference, and I don't think anybody knew at the time, and we once gave one of our persons chemoprophylaxis[45] using primaquine, and all of a sudden this person got hemolysis, very steep, and we had to give them a blood transfusion. We said, "What's going on?" Because African Americans had taken it. I mean, that was one of the part of prophylaxis.

I'll never forget, a World Health Organization physician was going to come. He said, "I'm going to take care of malaria in Iran. We're doing an eradication program, and one of the things we're going to do is to give them primaquine as part of chemoprophylaxis." I said, "Don't do it. If you do it, you'll be chased out of the country, or you may be killed because many of the Iranians will develop a severe hemolysis."

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[43] Primaquine is a medication used primarily for treating malaria.

[44] Hemolysis is the breakdown of red blood cells and the release of their contents into the surrounding area. Symptoms include fatigue, dizziness, and jaundice. There are several possible causes of hemolysis, including parasites, autoimmune diseases and genetic disorders like glucose-6-phosphate dehydrogenase deficiency.

[45] Chemoprophylaxis is disease prevention by use of chemicals or drugs.

AM: How prevalent was malaria in Iran?

JB: In certain parts. If we would go into certain areas, we would take a prophylaxis ourselves. But other parts -- where we lived in Shiraz, there was no malaria. It had been eradicated. In many other parts of the country there was malaria, and we knew where it was and we were very careful about that.

AM: Maybe you can discuss the timing of your work with what was going on in the United States with G-6 [glucose-6-phosphate dehydrogenase deficiency], because that work was, until Paul Carson's 1956 paper[46] comes out and [Ernst] Beutler's 1957 paper[47].

JB: That's right.

AM: And your *Nature* paper[48] comes out in 1959.

JB: I've forgotten.

AM: It was all one right after the other.

JB: Oh, yes.

AM: Put this in context for me. At what point did you realize that favism and the hemolytic anemia as a result of these anti-malarial treatments that were being studied in the United States, when did they get linked? And were you aware of what was going on here with Carlson and with Beutler?

JB: Yes, yes. I read Carson's 1956 article there, so I was aware of what was going on there. But they did not deal with favism. Favism *is* present in the United States among Italians and Greeks who take -- well, that is, what the British call the broad bean. But favism was not -- at least, we knew about favism in Italy and in Greece. Then when we realized it and found what we were dealing with coincidently, after G6PD deficiency was discovered the association was made by the Italians and the Greeks, and, of course, we had it in Iran, too.

We also were talking to the Israelis, because a very large group, [Aryeh] Szeinberg and [Chaim] Sheba[49] and Bracha Ramot[50], and I was writing them back and forth. Actually,

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[46] Alving AS, Carson PE, Flanagan CL, Ickes CE. Enzymatic Deficiency in Primaquine-sensitive Erythrocytes. Science (1956) 124 (3220):484-5.
[47] Beutler, E. Iron Content of Hemoglobin in Iron Deficiency. Nature (1958) 181(4612):837-8.
[48] Walker DG and Bowman JE. Glutathione Stability of Erythrocytes in Iranians. Nature (1959) 184:1325.
[49] Chaim Sheba (1908-1971) was born in Romania, studied medicine in Vienna, and emigrated to Israel where he was an important figure in the fight for the formation of Israel as a state. Sheba helped establish the first medical schools in the land and was awarded the Israel Prize in medicine in 1968.

before we left Iran, we went to Israel for two weeks. I was invited by Szeinberg and Bracha Ramot and Sheba. Sheba's a wonderful guy. Now they have the Chaim Sheba Medical Center there. We were guests there for two weeks because of our work with G6PD deficiency, and other things, too. The familial Mediterranean fever[51] was done there, and we saw some of that in Iran, too. One of our colleagues, who was an expert on it, Hobart [A.] Reimann, had written on the familial Mediterranean fever here.

We had a wonderful time in Israel for two weeks. We stayed near the hospital, in very primitive facilities, but that's where the faculty lived, in that area. My wife and daughter said they were not very comfortable, so we moved to a hotel in Tel Aviv. They were there for vacation, too. We had a very nice time.

In Israel we saw some of the inequities between Jews and Arabs, and it was absolutely horrible. You could tell -- when you were in an Arab area, it was very, very poor. Or if you'd go into certain parts of [the city where] orthodox Jews [lived], they were very upset with the rest of the people. Foreigners would come to look at them there.

The last night we were there, they had a big party for us. When you live abroad, you don't like foreigners to talk about Americans, no matter what happens. That's the way it is. The last night we were there, they had a big party for me. There were about forty people there. It was very nice.

Finally, someone said, "Dr. Bowman, we'd like to ask you a question." I knew something was coming. My wife punched me in the side. (chuckles) He said, "How does it feel to be a Negro in the United States?" There was a dead silence. Finally I said, "Well, I want to ask you a question. I haven't seen any Arabs in Tel Aviv. Why?" He said, "What do you mean? We don't want Arabs in Tel Aviv. I said, "But suppose there was a wealthy Arab whose son fought on your side in the 1948 war, and suppose this son was killed fighting against Arabs on your side. Could he buy a house in Tel Aviv?" He said, "Of course not." I said, "Well, how dare you ask me a question about how it feels to be a Negro in the United States then?" (laughs) My God, they went into an uproar and some said, “You’ve been living in an Arab country.” I said, "You better know your history. Iran is not an Arab country." So it went on and on. Oh well - it’s one of those things that happens. But you just don’t like people doing that. Particularly when

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[50] Bracha Ramot (927-2006) born in Lithuania, was an imminent Israeli hematologist who is best known for her research into genetic hematological conditions, especially those common among Israelis such as G6PD and thalassemia. She was awarded the Israel Prize in medicine in 2001. For a brief biography, visit the website at: http://jwa.org/encyclopedia/article/ramot-bracha

[51] Familial Mediterranean Fever is a genetic disorder which causes repeated fevers and inflammation that often affects the lining of the abdomen, chest, or joints. A relatively rare disorder, it usually effects people of Mediterranean descent, especially Sephardic Jews, Armenians, and Arabs.

they do not see the point - they said, “Well, what’s wrong [with the way we treat Arabs]?” Let's get out of [talking about] Israel for a while.

AM: Okay. To get back to the science part of it, how do you explain this kind of critical mass that seemed to develop in the mid-fifties from a couple of different directions?

JB: Okay. Eventually, I became part of that group at the University of Chicago, which was the University of Chicago Malarial Research Unit. It was supported by the Department of Defense because our troops were in Korea were involved with malaria. In Korea that was a major problem. The University of Chicago malaria group was asked to work on various drugs for prophylaxis and treatment for malaria. And all of the prophylaxis treatment of malaria came out of the University of Chicago Malarial Research group, directed by Alf Alving and Paul Carpenter, Ernie Beutler - they were all there. [Robert W.] Kellermeyer at Stanford who is head of hematology was there. It was a marvelous group of people. They developed chloraquine prophylaxis[52], primaquine prophylaxis. They also did, at the prison, experimental malaria by injecting malaria in the prisoners, and then following their treatment. That's how prophylaxis treatment was done there right at the prison.[53]

At the same time as they started doing this, there were black prisoners there and there were white prisoners there, too. But all of a sudden they discovered that the black prisoners, when they were given primaquine, they would start getting hemolysis but it was a limited hemolysis. It would come down for three or four days and it kept on and would go up again, because young cells were coming on. So even though they had G6PD deficiency the young cells that came out were not G6PD deficient, but it only came on as the cells age.

All of this started there, so with that, all over the world, the Italians and the Greeks and the Israelis mostly. Then we in Iran started looking at G6PD there and the possibilities there. So all this started from the University of Chicago. It was a wonderful thing.

And I'll get to it -- when I came to the United States, I became part of that group, and I used to go every week to the prison, which was an education in itself.

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[52] Chloraquine is an antimalarial drug that was first used in the 1940s. Now chloraquine is increasingly ineffective in preventing malaria as the disease has developed a resistance to the drug.

[53] For more information about the history of US doctors experimenting on mental patients and prison inmates (including deliberately infecting healthy individuals with various diseases) see the following article published in the Washington Post: http://www.washingtonpost.com/wp-dyn/content/article/2011/02/27/AR2011022700988.html

AM: Joliet [Correctional Facility][54]?

JB: At Statesville [Correctional Facility], yes.

AM: It's kind of interesting. I was reading that in more than one of your papers about your patient selection. Anyway, before we get to there, just a couple more questions as to what you were doing in Iran. This is why we're here. So you had been trained in pathology, and you mentioned that at Howard, both as an undergraduate and as a medical student, you took no courses in genetics.

JB: No, none whatsoever.

AM: How did you learn the genetics to even understand favism as a genetic disease?

JB: There was literature, I had studied favism. As far as genetics and population genetics -because in order to do population studies I studied statistics. I had never had a course in statistics. (laughter) But we were isolated and we had nothing else to do - it was wonderful! The literature - we would get the journals and we started digging into it. I taught myself. It was fun. And I had never done that before. I had training in medical pathology and I knew about blood groups and things like that. We imported a fancy spectrometer so we could do G6PD assays there. All of the work that could be done anywhere - we had the equipment. The Iran Foundation would offer it to us and we'd go out on weekends and work and do population studies and then come back. My wife and daughter would go with us sometimes.

AM: How did you conceive of genetics? For me, somebody who now lives in a little bit different world, where we make distinctions between biochemical geneticists and population geneticists, and these early pieces that you just hit *Nature*. Every year or two you got another big hit in *Nature*. And you're doing biochemical genetics and you're doing population genetics and you're doing genetic theory of evolution, genetic drift. How did you see genetics -- if you can think back to those days when you were just learning, getting the techniques as well as the theories down, what was genetics to you?

JB: Well, I mean, I knew something about genetics before. It was part of one's education in biology and what have you. But it was sort of primitive, getting to the point of population genetics, and biochemical genetics, practically [they] didn't even exist really [at that time]. But as far as evolution, I studied anthropology and I had all sorts of books about anthropology. Then it was fun because we could connect history of Iran

[54] Joliet Correctional Facility, in Joliet Illinois, was established in 1858 while Stateville Correctional Facility was erected beside it in 1925. Originally meant to replace the outdated facilities at Joliet, Stateville instead operated simultaneously with Joliet until 2011 when Joliet closed. Stateville is still in operation.

and the differences that we saw there. I spent a lot of time looking at the history of Iran, and the rest of that part of the world. We had contacts with the Israelis, not the Italians or the Greeks. But books were there, we imported things to read, and we started to work. It was sort of natural.

One thing led to the other, and it all became connected, particularly learning the history of Iran and the migration from the north, from the Soviet Union. That was in the early days of Iran. The original Iranians - what they're called still today - the Zoroastrians. Zoroastrians came from the north and they went to the east and to the west. And the Shahanshah is called Aryamehr [meaning] the "Light of the Aryans". And these were the original Aryan[55] populations. They migrated over to India.

When we started looking at G6PD deficiency there, there were people also studying G6PD deficiency in India. We contacted them, and then we learned of the Parsis[56], where the Zoroastrians went over into India and mostly men were there. The Parsis of India have a high frequency of G6PD deficiency but the Zoroastrians do not. The reason why is because the men went there without women, and they married the women [there] and they started having [G6PD deficiency]. That is why the Parsis have G6PD deficiencies and their ancestors (Zoroastrians) do not. So all of this came together. It was partly biochemical genetics, anthropology, history - and all went into place. It was wonderful.

We enjoyed the work of the Israelis, and there were quite a few Jews in Iran, too. We studied them also. They were a different group there. We learned about the Kurdistani Jews with G6PD deficiency. The Ashkenazi Jews did not have G6PD deficiency. And why did they not? Because they were different people! So it was fun.

AM: Did Shiraz have any kind of medical genetics training, or human genetics training?

JB: I did it. (chuckles) I taught a course in the senior year in genetics, medical genetics to the students there. I got all the books and things to read and I taught it. After all I had been involved in genetics for five years studying genetics, writing in established journals.

AM: Tell me a little bit about your collaboration with Deryck [G.] Walker.

JB: Oh, yes. Deryck Walker was a biochemist, and he was head of biochemistry at Shiraz University Medical School. When I called him up about G6PD deficiency and

[55] Aryans were originally a pre-historic Indo-European language speaking people. Only later and through questionable scholarship did "Aryan" come to be associated with the blonde-haired, blue-eyed phenotype claimed by the Nazis as the ideal physical form.

[56] Parsis are Zoroastrians who according to tradition emigrated to parts of India to escape persecution by the Muslim Persian empire.

favism, because I'd been doing the work on it, we began a collaborating on G6PD deficiency, with assays, and we started writing papers together on favism. We had a wonderful time.

The interesting about favism is that some of the people who eat fava beans, even though they have G6PD deficiency, do not necessarily develop favism, or severe favism. We wondered why, so we bought fava beans from the market and we started making extracts. All of a sudden we said, "Well, some of these extracts don't work, and some do work." Then we began to look, and said, “Maybe the younger beans are the active ones, and the ones that are older are not.” So we started growing fava beans.

AM: So you used botany then?

JB: Yeah (laughs) we were botanists. We started growing fava beans in the garden there. I told all of the children in the neighborhood *not* to go where these fava beans were growing because there was an old wive's tale that if children go where they're growing, sometimes they'll come out and have hemolysis and die, because it was claimed that they were inhaling the flowering fava beans. This was well documented supposedly in Italy and in Greece. We wondered about that. One day I was out in the morning picking fava beans, young ones, and I saw someone in the distance, and this little child was over there walking and eating these beans. I said, "Oh, maybe that's how it happened." They walk in there, and the kids go on and eat them, and maybe that's why they were developing favism.

Anyway, we grew beans and we'd extract the young beans, and they were very hemolytic. But the older ones were not, not so much the older ones. Also, we cooked them, too. Because we said, "Maybe it's the cooking." I said, "Yes, okay." So we cooked fava beans quite a while and then we prepared extract and they were not active, but the ones that were uncooked were.

And it all depends on what type you eat. I had a technician in the laboratory. I was talking to her, and she was in the hematology laboratory, and all of a sudden she said, "Dr. Bowman --" I had been testing hemoglobins on her and testing the technicians for G6PD deficiency. I had tested her and I found that she was heterozygous G6PD deficiency. One day she said, "Dr. Bowman, I don't feel so well." I took her hemoglobin, which had been fifteen and was down to about twelve, and it slowly leveled out. I said, "Did you eat fava beans? I [warned] you about that." She said, "But I cooked them, Dr. Bowman." So they had very little of the active principal in them because they were cooked, so she had a mild hemolysis.

But we had fun growing the beans and extracting them. Deryck Walker and I began a collaboration. He was more into the biochemical aspects and I was into the population genetics, so we worked together on that. He eventually left and became a professor at

the University of Birmingham in biochemistry. I haven't heard from him in a long time now.

AM: I have a couple of questions that are going to kind of hint at some themes that then later emerge in your career. At this point in time in Shiraz, working with this genetic disease in this particular population, in terms of treatment and counseling, what kind of genetic counseling then did you do in the community?

JB: When we would go out for population studies, it was very interesting. What you do is you talk and [give] the reason why you want to do something like that on an individual basis. But we would go out to the tribes, and there would be hundreds of people. What we would do is we would get to the khan who was charge, and then we would explain exactly what we wanted to do and why we wanted to do it and why it was important to do. Then he would talk to the people. And some volunteered and some did not volunteer. People always [specify] “human volunteers”. [But] volunteers are always human—because an animal can’t volunteer. It’s important from a health point of view too and the reasons why. And some people would agree and they would hold up their arms. And then we all said that what we would do is when we get the test done we will send it back to them with the results. And those who do and do not have G6PD deficiency we would write it out and we would contact the khans (because we had a record of their names). It was something good for the population too. So that was part of our counseling.

AM: Okay. And was there any effort by the medical community in Shiraz which was working in this area, you and your colleagues, to propose screening programs, any kind of screening programs for those communities that were particularly susceptible to G6PD deficiency?

JB: Well, no, not in those days. We were the only ones who were interested in this. But we gave conferences to medical students and the physicians in and around there, and whenever we went in the area we would talk about G6PD deficiency. Many of them knew about favism and some of them did not - they didn't realize what it was.

It would depend upon what part of Iran - in the northern part of Iran, the people, even long before G6PD deficiency, knew about favism because it was once called by Iraqis’ ‘Baghdad spring fever’. It would come in the spring, always in the spring, because that's when the fava beans were being grown. We heard of a tremendous amount of favism in the northern part of Iran, and we wondered why. Then we began to question what was going on. Because in Shiraz, there was some favism, but they almost had epidemics of favism in the northern part [of Iran]. We asked, "What's going on?"

Then we learned, from talking to people, that in the northern part of Iran, the people eat the very young, fresh beans, not the older beans, but the young ones, the smaller ones,

not the older ones. But the Shirazi's say, "Well, don't do that. Do not eat the young beans because they're dangerous." So the people knew. But we didn't know. They said, "Well, the northern Iranians are crazy anyway because they eat too many young fava beans." They would say nasty things about the northern [Iranians]. The southern Iranians knew better, that if you ate beans that you should cook them, and cook them well, and then you wouldn't have problems.

4. Ethnicity in Iran and the US, Race and Genetics, Studying at the Galton Lab, and Working at the University of Chicago

AM: Also, Iran had a long history of being a nation state, or a state structure imposed on a multiethnic population. At this point in time, how did you conceive of race, and how did these different communities that you went in to take samples from conceive of the differences between their different communities -- tribes, or ethnic groups?

JB: Most of them didn't think too much of that. The Zoroastrians were inbred. The Zoroastrians, knew they were the original Iranians, and they were very proud of themselves. And they always intermarried. If a Zoroastrian male or female were to marry outside of the group, they would be rejected and considered no long Zoroastrian, and their children would not be. They had to be male, female, children, all within the group. So they knew that they were different and very proud of it. They would say, "We are the original Iranians."

There were differences between the Arabs who lived in the southern part and they were Sunni. Of course, the Shiite and the Sunnis[57], since the time of Muhammad - never should the twain meet. So the Shiites and the Sunni Arabs don't get along.

As far as Jews were concerned, in Iran, when we lived there, they respected them, they were not bothered, and the Shiites said they are people of the Book, and people of the Book, that's all right as far as we're concerned. Real Iranians looked at them -- and Muslims, supposedly, were usually accepted, not a problem. Now, if you're people of the Book, you're okay. That meant the Jews, Christians, Muslims. Now, those who were not people of the Book, of course, they didn't like very much.

So the Jews did very well there. There were wealthy Jews. Most of them were merchants and shopkeepers, and they were the moneychangers. They were not farmers. When we lived there, quite a few Jews said, "Well, we should go to Israel now."

[57] Sunni vs. Shiite Muslims: The division between the two main sects of Islam is based upon a disagreement over the proper succession of the prophet Mohammad. Sunnis maintain that the selection of Abu Bkr, a longtime follower of the prophet, as the first caliph and legitimate successor to Mohammad. Shiite Muslims claim Ali (the cousin and son-in-law of the Mohammad through his marriage to Mohammad's daughter Fatima) was the legitimate successor. To learn more, visit the webpage at: http://www.fas.org/irp/crs/RS21745.pdf

There was a large population of [Jews] north of Shiraz, and practically all of them went to Israel. A year later, most of them came back. They said, "We don't like that place. They wanted us to dig ground. We never did farming. We're merchants, we're bankers and teachers." They didn't like it at all. (laughs) So most of them came back to Iran.

My wife had a lot of contact with the Jews in Iran because she worked with the preschool programs. She is an expert in preschool education and she developed a preschool program in Shiraz which was the American-Jewish Committee.

But one group, the Baha'i[58], they are a no-no to Muslims, and particularly the in the Shiraz region. Because the Baha'is believe -- well, the religion began in Shiraz by the Bab [Sayyid Ali Muhammad Shirazi]. Baha'i were converts from Islam to the Baha'i religion, and that's a no-no. Anybody who converts from Islam to another religion are outcasts, and sometimes killed too. Iranians believe – and they still believe to this day -- that the Baha'i religion began at Number 10 Downing Street[59] in London, because that was the sphere of the British, and they said this [religion] was part of a British [plot] to divide and conquer [the Iranians]. That's why even today they dislike Baha'i. Baha'i have a very, very hard time. They're a very closely knit together.

One of the things they did not like about the Shahanshah before the Revolution was that his pilot was a Baha'i, and the Shahanshah protected the Baha'i. He said these people are honest, they work hard, and they hate war and they don't believe in fighting, they're peaceful. He encouraged a lot of Baha'is to be part of his entourage, and I think that's maybe one of the reasons for the [Iranian] revolution.

But now, when we went back a year ago, Baha'is now are not allowed to own property. If they go to school, they can only go to school [through] high school and that's it, never enter a university. So it sort of decimated the people there. There were many, many Baha'is there that I knew. When we went there a year and a half ago, we were invited

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[58] Baha'i faith began in mid -19th C. Iran when Mirza 'Ali Mohammad of Shiraz (later known as the prophet Bab) proclaimed the imminent arrival of the a new messenger from God. Persecuted by the Muslim majority, to whom his proclamations of a prophet superior to Mohammad were blasphemous, the prophet Bab was imprisoned and put to death while thousands of his followers were killed. in 1852 Mirza Hoseyn 'Ali Nuri, an early and devoted follower of Bab, proclaimed himself the awaited prophet and assumed the title Bahá'u'lláh. Persecuted, imprisoned, and exiled, Bahá'u'lláh nevertheless acquired many followers and successfully established the Baha'i faith. For more information, visit the website at: http://www.religionfacts.com/bahai/history.htm

[59] Number 10 Downing Street is the official address of the prime minister of Great Britain. Belief that the Baha'i faith is a fabrication of British imperialists in order to undermine Iranian independence has been circulated throughout the 20th C. despite historical research to the contrary. For more about this topic, see: http://www.religion.ucla.edu/index.php/news/114-the-invention-of-the-other-anti-bahai-british-conspiracy-narratives-in-iran

to one of my former technician's house for dinner. I looked around, and everybody that was there was Baha'i, in the room. I knew they were Baha'i - but they were hidden.

As far as difference is concerned, they recognize it. When I went there -- other than those I knew – [people] didn't know what I was. When I'd go around the Middle East, to Egypt or Saudi Arabia, the people are different. There's not, as far as discrimination goes, 'color'. I'll never forget, we were once in United Emirates, in the marketplace, and [we heard] the call for Moslem prayers. Suddenly, Arabs started coming in to pray and my wife looked around and she said, "It looks like we're on Forty-Seventh Street in Chicago." Many were very dark, some of them were not very dark. If you look at pictures you see. [For example] the former ambassador to the United States, you couldn't tell what he -- I mean, he could pass for an African American -- but they are not considered black.

AM: Race in the United States has always been constructed by cultural, social, political, economic status, as well as scientifically or biologically, at least until recently in the Human Genome Project[60] and the Human Genome Diversity Project[61]. But at that time, you were studying these genetic differences among different *ethnic* groups. What were your assumptions about, as you were learning genetics, the role genetics had in defining what we would then call race?

JB: That's a very, very difficult question. I tell people that if we were all the same, if humans were all the same and looked alike and what have you, *homo sapiens* would have been decimated thousands of years ago. The reason why we are different is because of survival, because we have genetic differences, and that's an advantage. I say be thankful for the difference.

When people say there's no such thing as race, I say, "Well, let's look at it a new way. Let's call it population." Give me a sample of two hundred people, and if all of them are

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[60] Human Genome Project, completed in 2003, formed primarily to map the entire human genome, identifying every gene found in human DNA and to analyze that knowledge, including the ethical ramifications of that knowledge. It is a multi-national research project led by the US government. For more information visit the website at: http://www.ornl.gov/sci/techresources/Human_Genome/home.shtml

[61] Human Genome Diversity Project, established in 2002 by an international group of scientists based at Stanford University, was inspired by and partly made possible by the research generated by the Human Genome Project. The aims and of HGDP are different from the HGP however. The purpose of HGDP is the large-scale systematic study of human genomic variation in order to facilitate studies of the genetic geography and history of the human species in order to facilitate disease research and anthropological studies, especially of vanishing people groups. To learn more, see: http://hsblogs.stanford.edu/morrison/2011/03/10/human-genome-diversity-project-frequently-asked-questions/

blood group O, and say about fifteen or twenty percent are of the Diego antigen[62], these are Amerindians and no other population in the world. I said, "Get another group in which you find that forty-five percent are Rh negative They're Basque[63] - and no other population in the world." And then as far as sickle hemoglobin, it's found everywhere, in many parts, and I've mentioned that. As far as I'm concerned, these things are important for survival. As far as pigmentation is concerned, dark skin, light skin, it's really depends on where you live [whether] it's an advantage. I don't worry too much about race.

AM: Just to get back to -- because we're going to talk some more about this later --

JB: Yes. I have a beginning chapter in this book[64] in which I discuss it.

AM: Right. That was written in the 1990s. I brought my copy. But in the late fifties and early sixties, and you're starting to approach these issues genetically, was this concept of race in the back of your mind, or in the front of your mind?

JB: No, it wasn't. I was studying differences in population genetics and the reasons why and looking at advantages and disadvantages. For example, when I worked on adenylate kinase[65], it was for a purpose. I was looking at a difference between Africans and African Americans and European Americans and a mixture, which you can do with things like -- these are the things I was thinking about, more from a scientific point of view.

AM: We're going to get back to a lot of these themes as we move through your career, but I just want to finish up in Shiraz. In 1961 you go to the Second International Congress of Human Genetics in Rome, and you present a lot of this work. In that, you do mention genetic drift[66].

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[62] Diego antigen group is made up of 21 rare blood factors which are found only in Aboriginal American populations of North and South America, the Mongolic peoples of East, Southeast, North-Central and Northeast Asia.

[63] Basques are a people whose home is in the border land between France and Spain among the mountains of the Pyrenees. They have their own language (called Basque) and have a high incidence of Rh negative factor in their blood, making them genetically distinct.

[64] Bowman JE and Murray RF. *Genetic Variation and Disorders in Peoples of African Origin*. Johns Hopkins University Press, Baltimore, 1990.

[65] Adenylate kinase is an enzyme which catalyses the interconversion of ATP, ADP, and AMP.

[66] Genetic drift is the concept that within a generation of organisms, some organisms will produce more offspring than others, not because of natural selection or any genetically-based advantage, but simply by random chance. Their particular genetic inheritance therefore may become more prevalent in a given population, all through random (not natural) selection. The heart of the idea is that random factors (instead of primarily fitness or advantage through natural selection) can also have important influence

JB: Oh, yes. A lot of it is drift.

AM: How did you move beyond looking at a specific genetic disease to much more general and theoretical questions, like what we would now call human origins and migration patterns and concepts like genetic drift or natural selection, or even now what we call neutral selection[67]? How did your ideas shift from the very specific case of a child [with favism] presenting himself/herself to [asking yourself] much larger questions about natural selection and evolution?

JB: Well, a lot of the things that we looked at, we were wondering why. What about Rh negative? [It's] very important from a clinical point of view. And I was looking at it from a scientific point of view, too. For example, as far as the director of the blood bank [is concerned] if someone came into the hospital and they needed a blood transfusion, and if it was an emergency to the point that you had to give a blood transfusion without cross match[68] (which sometimes you have to do) you would pick blood that is O blood to start. It may not be the best thing to do, but it was the best thing *you* could do. But you would make certain that that blood in the blood bank was Rh+ or [Rh]- because if this person came in the hospital with problems, such as a pregnant woman, and they gave her Rh+, this would be a disaster[69].

I knew as far as there were problems with Rh and Rh- that it depended on the population that you're dealing with, because you have to know these things are important from a health point of view, too. There's just certain things you would not do. If someone came in the hospital, and if I knew this [person] was African American or not African American, they have to be dealt with differently. This is medicine, and we don't like to talk about these things, but it's important.

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over the gene pools of populations. For more information, visit the webpage at: http://www.talkorigins.org/faqs/genetic-drift.html

[67] Neutral selection, unlike natural selection, is the theory of the process of genetic mutation that does not provide the organism the mutations occur in with any significant advantage. The theory further states that most genetic mutation is neutral—only rarely does mutation significantly benefit (or disadvantage) the organism it occurs in.

[68] Before a blood transfusion is performed, usually a complex set of tests determine if the donor's blood is compatible with the blood of the intended recipient. This set of tests is called a cross-match. In cases of emergency when there is no time for this set of tests to be performed doctors sometimes administer a blood transfusion without knowing the blood type, etc. of the recipient. In such cases, the benefits of unmatched blood transfusion are considered greater than the risk of an antibody-mediated transfusion reaction.

[69] Sometimes an Rh- mother and an Rh+ father will produce an Rh+ fetus. If the fetus's blood comes in contact with the mother's blood, the mother's blood will produce anti-bodies to attack the foreign Rh+ factor of the fetus's blood cells. This can cause the break down of the fetus's red blood cells, a process called hemolytic anemia, endangering the fetus. Therefore, knowing the Rh factor (+ or -) of a pregnant recipient of blood transfusion is vitally important.

I don't worry about what you call it, and the definitions are different. I mean, as I said before, I'm African American and I identify myself because I know that if I go to Brazil, I'm white, because I'm educated. If I go to South Africa, I'm being considered colored. My wife, you couldn't tell what she is. If you go to another part of the world, it's different. I don't know.

I don't worry about those things very much myself. I look at people as they are, and then wonder why. If there's an albino and I know the person has albinism, they're not supposed to go out in the sun unless they're covered. In Africa, Albinos, practically none of them [live] past the age of thirty because of cancer of the skin. That's important! I mean, I look upon a lot of these things from a medical point of view and the reasons why they're important. And we must not ignore them. A little bit later on we'll get into stem cell research.

AM: I need to pop in a new tape, so I'm going to pause the tape.

JB: All right.

AM: We're back after a little break. I want to get back to the chronology just a little bit. The International Congress of Human Genetics that you go to in 1961 and you present a paper -- I think you also go to the Third International Congress, is that correct?

JB: Yes.

AM: In '61 had you already decided to leave Iran?

JB: Yes. Oh, we were on our way to the Galton Laboratory. It was a coincidence that I was going [to the congress]. I had submitted a paper there, and then after that we left and went to the Galton Laboratory, right after that. That's when I met quite a few fellows there -- [Sir] Ronald [A.] Fisher[70], who was famous, Alex [Alexander S.] Wiener[71]. They didn't like each other very much at all and they were at odds about blood groups and Rh. I'll never forget - Sir Ronald Fisher was sitting up while Wiener was giving a paper. He had a newspaper. He had very poor vision and was reading his newspaper the whole time Wiener was talking. (laughs) Then I met him later on, that is when I went to England, because he and [Lionel] Penrose were very good friends.

AM: You had been in Iran for “too long”, and you had developed a very strong and active interest in genetics.

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[70] Sir Ronald Aylmer Fisher (1890-1962) was a British statistician and geneticist . He is best known for his work in applying statistics to scientific experiments. For more information, see his brief biography at: http://www-history.mcs.st-and.ac.uk/Biographies/Fisher.html

[71] Alexander S. Wiener (1907-1976) was an American physician known for his work in forensics, parentage studies, and research into blood factors and diseases, including identifying Rh factor.

JB: Yes.

AM: Why did you decide to go back to more of a postdoc position than a faculty position and continue to do the kinds of work that you needed to do? You had mentioned you knew that [University of] Michigan and [University of] Wisconsin had human genetics, medical genetics programs. So why specifically go pursue more training in genetics, and why not the other labs in the United States, like Michigan or Wisconsin or some of these other large labs?

JB: Well, I was offered employment at the University of Chicago. As I told you, Alf Alving, when he heard my paper in Tokyo in 1960, said, "If you ever come back to Chicago, you should call me up." My wife and I -- I had an opportunity at the University of Colorado, and Chicago was my wife's home so we came there to Chicago. We were living with my mother-in-law. My father-in-law was dead by then. I was thinking about Colorado, and I said, "Well, Alf Alving asked me to call him up at the University of Chicago." So I called him up. He said, "Oh! I've been thinking about you. I heard your paper in Tokyo. Come over, I want to see you."

I went over to see him, and we were talking about what I was doing and what have you and that I'd been to the Galton Laboratory. He said, "Dr. Bowman, I have a paper here I want you to read, and it's in press. What do you think of it?" I said, "Okay, fine." I looked at the paper and I saw that their statistics were all wrong, and the conclusion. The paper was in press, but it was wrong. I called him up and I said, "Your paper is wrong." He said, "What? I told him that, I told him that." And I went back and I explained why it was wrong.

Then the next day he called up and said, "I hear that you're going to the International Congress of Hematology, in Mexico." He said that Leon Jacobson[72] was head of the Department of Medicine and a hematologist and he said, "We want to offer you a job at the University of Chicago. We need someone who has directed a blood bank, and you've done that for years all over the world." I said, "Okay." He said, "But he [Jacobson] wants to talk to you at the Congress."

So I called him up at his hotel and he said, "Oh, yes. Let's go out to the pyramids." And I spent a whole day with him at the pyramids, just walking around. We just talked about -- nothing about medicine. He said, "Let's go to dinner at my hotel," and then he offered me a job at the University of Chicago. I said to myself, “Well, I haven't been interviewed - well, I've been [interviewed] all day long.” (chuckles) It was like the SEVAK person in Iran.

[72] Leon Jacobson (1911-1992) was an American hematologist and best known for his research in the use of radiation and chemotherapy in medicine, especially to fight cancer.

So I was offered a job at the University of Chicago, because of my contact with Alving. So I came on the faculty as assistant professor - being a professor in Iran. I went up through the ranks. Eventually, I became -- I didn't realize then -- but the first black to get tenure at the University of Chicago in the medical school. There was one other person years ago in the Department of Pathology, but he became assistant professor and eventually left. But I was the first tenured professor. It was a wonderful time. There met [Paul] Carson[73] in person, Ernie Beutler[74], [Robert] Kellermeyer, and many others who were involved in the University of Chicago Malarial Research Project on primaquine sensitivity - and they are still doing it. They were doing all sorts of stuff there.

AM: Tell me a little bit -- because you end up at the Galton Lab before you come back to Chicago, or no?

JB: Oh, yes, at the Galton. That was on the way.

AM: How long were you at the Galton Lab?

JB: I was there a year.

AM: And what was your goal?

JB: Well, it was to simply go there and learn the genetics that I'd been reading about. I met Nigel [A.] Barnicot who was a professor of anthropology, a very prominent person. He had heard about my work, and we were talking about it. So I met him and had a wonderful association with him, talking about ideas about anthropology and origins and some of the things that we've been talking about there.

At the Galton Laboratory I met Peter [B.] Medawar[75], who was there. He was a very good friend of John Maynard Smith[76] and Sheila Maynard Smith. Both of course are dead now. But John Maynard Smith taught me Drosophila genetics. I took a course in Drosophila genetics there.

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[73] Paul Carson (d. 1985) was a physician and the chairman of the pharmacology department of Rush-Presbyterian-St. Luke`s Medical Center. He was perhaps best known for his research and development of antimalarial drugs.

[74] Ernie Beutler (1928-2008) was a German-American hematologist best known for his work in G6PD primaquine sensitivity as well as his identification of the process of random X-chromosome inactivation. An interview with Dr. Beutler is available in this collection.

[75] Peter B. Medawar (1915-1987) was a Brazilian-born British scientist who shared the Nobel Prize for acquired immunological tolerance. For more information, visit the website at: http://www.britannica.com/nobelprize/article-9051717

[76] John Maynard Smith (1920–2004) was a British evolutionary biologist and geneticist. He is best known for his work developing the modern synthesis of evolutionary biology and genetics. His wife was Sheila Maynard Smith. For more information, visit the webpage at: http://www.independent.co.uk/news/obituaries/professor-john-maynard-smith-549817.html

Penrose taught about genetics in general, and I went to lectures of the biochemistry department, in the graduate biochemistry. I did a little research there, too. There were some things published through there.

It was a wonderful group of people. We met J[ohn] B.S. Haldane[77], of all people. He was a close friend of Penrose, and this was before he went off to India. He would come by and see Penrose, and Victor [A.] McKusick[78] would come there. I met him at the Galton Laboratory –E[dmund] B. Ford[79].

All of them came by to see Penrose because Penrose was Penrose - an absolutely marvelous person. He was a Quaker[80]. In fact, he left England and spent quite a few years in Canada because he did not like war and violence. He stayed away and came back after the war, when became Galton Professor. He was a marvelous influence on me because of his ideas about eugenics[81]. I'm trying [to write] a book now that is about eugenics because he hated eugenics and then he became Galton professor. He was *the* Galton professor, and the Galton professor edited the *Annals of Eugenics*, and he changed the name to the *Annals of Human Genetics*.
I really had a nice association with [Hans] Kalmus, the expert on color vision. John Maynard Smith and his wife [Sheila Maynard Smith] we wrote a paper together there too. [I met] Ursula Mittwoch. Alex [Alexander] Bearn came after I did, but I met him while I was there. And you know Lawrence [J.] Schneiderman. He was one of my colleagues at the Galton Laboratory, just a wonderful, wonderful fellow. And I see him a lot now because he has been writing about ethical issues in genetics at the Galton Laboratory. There were so many people who came through there.

It was just a wonderful experience. My wife and I fell in love with England, and my daughter went to school there. She came back with an English accent. And my wife, it was the first time in her career that she didn't work because she would have to get all sorts of things as a foreigner to work there. So she spent most of her time at the British Museum, and the museums and art places like that, and taking care of our daughter. So we left there with fond memories of the Galton Laboratory that we've never forgotten.

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[77] John B.S. Haldane (1892 – 1964) was one of the founders of population genetics and an evolutionary biologist.
[78] Victor A. McKusick (1921–2008) was an American geneticist and regarded as the father of clinical medical genetics. See Victor McKusick interview in this collection.
[79] Edmund B. Ford (1901 – 1988) was a British ecological geneticist who specialized in butterflies and studied polymorphisms.
[80] Quakerism, also known as the Religious Society of Friends, is a religion based on the idea that anyone can communicate with the divine without the need for a spiritual leader.
[81] Eugenics is the study and practice of improving human populations through selective breeding.

Particularly John Maynard Smith, who was an evolutionary biologist, all these books he's written. He actually became FRS [Fellow of the Royal Society][82]. We saw him about five years ago. I went back for the hundredth anniversary of the birth of Penrose. They had a large meeting there in which I saw Barton Childs[83]. Barton Childs had been at the Galton Laboratory before me. He and Penrose became very good friends. Barton Childs was there at the anniversary. There were quite a few that came back for the anniversary. Penrose is a wonderful, wonderful person. He's never bragged about anything - you wouldn't even know that he was *the* Galton professor. At the graduation ceremonies, even though he had all sorts of degrees, he always wore his master's [gown] from Oxford. I mean, that's the highest thing you can do – MA at Oxford. He would always wear that. It was a wonderful place.

AM: You had learned genetics on the fly, so to speak, in Iran.

JB: Yes.

AM: And you were pretty much isolated and were free to do a number of different things, including growing your own plants to use in your experiments and read about more theoretical issues.

JB: Sure. And there were no grants. We did it on our own.

AM: Right. And then you go to the Galton Lab, which has a long tradition of working human genetics and medical genetics, and which some might argue is the birthplace of human genetics. What did you learn at the Galton Lab about human genetics?

JB: Well, I learned a lot of things I had already read. I had a couple of courses that were reserved for fellows. It was [through] contact with Penrose and conversations with John Maynard Smith and Barnicot and meeting Medawar at lunch afterwards and talking on the commons because he and John Maynard Smith were very close. So most of it was synthesizing what I had learned, what I'd been reading about, and trying to put things together, not necessarily in a so-called classroom, because there were no examinations - they lectured and that was it. It was a matter of having to talk about ideas about genetics. And that was the more important than formal classes - except that I loved playing with Drosophila[84]- it was fun.

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[82] Fellow of the Royal Society is a United Kingdom academic society for scientists from the UK. For more information on FRS, see their website: http://royalsociety.org/.

[83] Barton Childs (1916-2010) was an American physician and geneticist well known for studying different diseases. See Barton Childs interview in this collection.

[84] Drosophila is a genus of fruit fly, most commonly Drosophila melanogaster is used in labs. A model organism used in many scientific experiments since it is relatively inexpensive, has a high fecundity and a short life span, and has a discernable phenotype and genotype.

AM: So you had already been assured a position in Chicago when you went to the Galton Lab?

JB: No. Uh-uh. We took a chance when we went to Iran, and we took a chance when we went to the Galton. No, I didn't have a job at all. I was going to come back to the United States and look around. I had had a contact with the University of Colorado and there was an opening there, and I was going to look into it. I think I had some letters. I forgot how the contact started, or ended. But when I was invited by Alving, whom I'd known before, to work in the group, that was it, there was no problem. And plus, Chicago was my wife's home. All of her relatives are there, too.

And plus, I liked the University of Chicago. I had just a wonderful group there. Everybody said, "Oh, you're going to the University of Chicago, that racist place?!" It was not as far as I was concerned. Only one thing was said to me in the forty-seven years. It was not racist, but it was, in a way. It was indirect, and these are the things that you have to ignore. There was a very prominent professor who saw me, and he walked up to me and put his arms around me and said, "You know, Dr. Bowman, we're very proud of you." Now he would have *never* said that to another professor. I was a full professor, and he would never have said that. But he didn't mean any harm. He was very nice. I wouldn't say who he is - eventually he died. His son died and I saw him in the hall [after his son's death] and he cried on my shoulders. He was a very nice man. And why would I be offended, even though it was a racist comment. He would have never said that to another professor, "We are very proud of you."

AM: Well, with all this uncertainty about where you would end up and what you would be doing, what was driving your scientific interest? Where did you see your research going? You had clearly established yourself. I've had some experience interviewing young biomedical researchers who one paper in *Nature* they would have said was a career maker, and you had four papers come out within six or seven years. All of them were in *Nature*. So clearly you had the scientific credentials, but where did you see where you would go with all this new genetic knowledge and technique?

JB: Well, I didn't necessary think about that. I started doing work with Alving's group and Paul Carson at the University of Chicago, and I applied for a grant to study G6PD deficiency population genetics. I mean, I had ideas that I wanted to do, and they came through. So I had an opportunity to follow my work in Iran about human polymorphisms.

I heard about an opportunity to study in Mexico. Alfonso el deGaray was at the Galton Laboratory at the same time I was there, and when I left the Galton Laboratory, I remembered that he had gone back to Mexico. He was Head of the program of the Atomic Energy Commission of Mexico [National Commission on Nuclear Energy], and I wanted to study Mexicans and their origins, particularly I was interested in looking at the

Sephardic Jews[85] in Mexico. The Sephardim was a very long, distinguished group. I could look at their G6PD deficiency.

So I started running around with Alfonso de Garay to Yucatan and spent a couple of sessions with the Lacandones[86], who were the last of the Mayans. I wanted to look at them and find what they had. There were only two hundred left in this world. We flew in by light plane, and we walked, and [went] by horseback to various villages in the area and did some very nice work, I thought, amongst the Lacandones. They did not have G6PD deficiency, but they did have adenylate kinase [polymorphisms] and that was important. So we started exploring them.

As part of the work there, a lot of that started off actually to a wonderful chapter that I liked very much in the book about Africans and their origins. Then I learned about Africans in Mexico long, long, long before Columbus. Everything came together. I knew that there were Africans still in Mexico, but I never had a chance [to study them] because they lived in the southern part. I didn't get to there.

I spent most of my time in and out of the jungles of the Lacandones, learning to appreciate the people. These are people isolated who have been there for years, before [Hernan] Cortes[87]. They were the last of the Mayans that went in there, and nobody could go in there. They were only discovered by missionaries in 1946. Nobody knew anything about them before that.

So we went in there and said, "Look at that." They were just wonderful, wonderful people. The missionaries flew us in and out with airplanes. But they didn't like the Lacandones because they could not convert them to Christianity. They said, "We've been trying for twenty years to convert them, but they'll not be converted." I said, "What happened?" He said, "Well, when we went there, we told them about Jesus Christ, and we talked about him, and the son of God." The Lacandones said, "Well who is Jesus Christ?" Then they said, "That's ok, we'll take him as one of our gods." (laughs) The missionary said, "No, no, no. There's only one God." They said, "But how can you do that? We have many gods. If we do something and a god is mad with us we go to another god, and he doesn't know what we've done." (laughs) That was so beautiful. Here I was listening to these people who couldn't speak English and had been living in isolation. So the missionary said, "You must not kill or steal." They said, "We don't kill and we don't steal. Maybe you could have our religion?" (laughs)

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[85] Sephardic Jews are from the Iberian Peninsula and North Africa.

[86] Lacandones are a Mayan group of nearly isolated people in Mexico in the state of Chiapas in the Lacandon Jungle.

[87] Hernan Cortes (1485–1547) was a Spanish explorer and conquistador who conquered the Aztec peoples and established Spanish rule of Mexico for the next 300 years.

We were there and we were working, and doing a test that I had developed for screening for G6PD deficiency in the field. One of the Lacandone Indians started watching me, and the next day he said, "Could I do it?" I said yes. He did it perfectly, just like that. That was a wonderful opportunity. But we can talk about Mexico and Africa comes later.

When I went to the University of Chicago, I had grants to do population genetics, as I had been doing in Iran, and eventually wound up doing work in Ghana and in Nigeria and Cameroon and -- no, not Cameroon, one of my students went there. [And I] went to Uganda and then to Ethiopia. But that's another story about the Ethiopian part.

AM: When did it become clear to you, or even to Beutler and this whole mass of research being done on G6PD deficiency, that this wasn't just looking at a genetic disease and mechanisms of transmission, but that it had become a tool, a marker, to study population genetics?

JB: Oh, yes. Remember, that was very important because there' are many variants of G6PD. In the days that we were looking at it, there were not that many. Now there are zillions of them. But we were looking at G6PD deficiency in various populations and, of course, there was a lot of literature to it too. Number one, about the differences that you would find in Jews, or you would not find. You would find G6PD deficiency in the Kurdistani Jews, which is a very, very -- they're, I think, the largest population in the world that have it there, as against the Ashkenazi Jews which did not have it and why.

When I went to Israel and talked to Israelis, and back and forth after I left, I kept on saying. “Why are these people different?” Eventually, I studied the so-called Falasha [Jews] in Ethiopia. They were quite different. And going back to the history of Judaism, one of the things that I ran across that was very interesting was that Jews maintained they did not proselytize. I mean, they did *not* do it. I said, "But you do proselytize. Look at the Asian-Indian Jews. They're Asian Indians. Look at the Falasha in Ethiopian. They're Ethiopians. All of this is from proselytizing."

I told them about a joke that they hadn't hear about that once a Jew from New York went to China, and all of a sudden he [came upon] a synagogue and there was a Chinese rabbi. The Chinese rabbi [asked him, “Are you Jewish?" He said, “Yes.”] And the rabbi looked at him and he said, "You don't look Jewish." (laughs) This is an apocryphal story but this is an example. So they were there because you proselytized. The Falasha - the Jews in Ethiopia - were there because you proselytized. That is part of your heritage, and it's a beautiful part, because you could proselytize amongst people who did not -- this was long before Islam. The Zoroastrians did not proselytize. They were a bunch to themselves. So you [Jews] had an advantage by proselytizing

amongst people who did not proselytize, and you were the first of proselytizing religions. The second one was Christianity. And the next was Islam.

I would try to look at these groups from their history and why they were different. Why are the Asian Indians different? Why did they have G6PD deficiency? Because they're Asian Indians. Why did the Ashkenazi Jews not have it? Because they were Europeans. They came from another part of the world. I love it. The Ashkenazi Jews did not have Familial Mediterranean Fever, and so forth. The indigenous groups in the Middle East do. They're different, because they're different peoples. I look at it, as far as my population genetics, is trying to understand the history of the people in conjunction with the things that I look at in genetics. Oftentimes, it would come together.

5. University of Chicago

AM: Outside of this group that had formed around Alving in the malarial research program here at the University of Chicago, what other groups were working in genetics?

JB: At the University of Chicago?

AM: Yes.

JB: There were terrific ones, because they committed – [before] Alving died he had started a group called [Section on] Genetics and International Health, so that's why we were looking not only at genetics but international health and peoples. Then there was formed by Bernard [S.] Strauss a committee on genetics. The university has lots of committees, rather than departments. And they're integrated. So Bernard Strauss was a professor of microbiology, started the idea to have a committee on genetics rather than a genetics department. Now they have one there.

I became part of the committee on genetics because I was working on genetics in association with biologists and other scientists. Those of us who were in medicine and in other parts who were also interested in genetics were made a part of the committee on genetics, so there was a lot of interaction there, too. Now they have it much more formalized as far as they're concerned, at the University of Chicago. And there are many people outside of human genetics, just like Janet [D.] Rowley[88] of course [were involved].

AM: Your appointment was at the medical school. Was there a training program in medical genetics or any course work in medical genetics?

[88] Janet D. Rowley is an American geneticist who did break-through genetic research in chromosomal translocations. See Janet Rowley's interview in this collection.

JB: Yes, this was done and some of us gave occasional lectures and that. It became formalized, too. But you have to look at the University of Chicago. Even though we were in the department -- the medical school is part of the Division of Biological Sciences, and the dean is the same. The division has a dean. And there's a lot of interaction. Quite a few of us had appointments outside of the Division of Biological Science, like I became part of [Committee on] the African and African-American Studies and other groups too.

AM: On the non-medical campus, call it the main campus of the university, did they have a Department of Genetics, or was it part of molecular biology or School of Biological Sciences? How was genetics being taught, and did they have human genetics being taught alongside Drosophila?

JB: Oh, yes. It was part of that. It was not a department then, but it is now one. In the early days, we were all together and interacting with each other. I did some work for [Richard C.] Lewontin[89], who was a professor there, who was at Harvard and one of the activists. He always was an activist and I loved that and we had a great time. He was interested in variation and what have you, and I did some work for him.

Then I had connections with Strauss' group and he had a student, [Robert R.] Brubaker. I was doing work in humans, and we started talking about bacteria. I said, "Bacteria must also have enzymes, too, so let's do some work with bacteria." So we wrote a paper. I think it was one of the first papers on genetic variation in bacteria. We were distinguishing between E. coli [Escherichia coli] and all sorts of organisms and what have you.

AM: This was your *Journal of Bacteriology* paper[90]*?*

JB: Yes. So that was my introduction -- because, look, G6PD and enzymes and so forth, these [organisms] have it, too. And they must have polymorphisms. So we were trying to delineate one group from the other bacteria. Now it's much fancier - what they can do now with fancy techniques. But we were looking at enzymes in humans. And that was part of an interaction within the division of biological sciences.

AM: You had spent the first part of your career not having to worry about funding, getting grants, writing grants. Science was organized a little bit different in Iran, and one could also argue, at the Galton Lab.

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[89] Richard C. Lewontin is an important American evolutionary biologist and geneticist who developed molecular population genetics. For more information see his interview in this collection.

[90] Journal of Bacteriology: Bowman JE, Brubaker R, Frischer H and Carson PE. Characterization of Enterobacteria by Starch-Gel Electrophoresis of Glucose-6-Phospate Dehydrogenase and Phosphogluconate Dehydrogenase. Journal of Bacteriology 94 (1967)544-551.

JB: Yes.

AM: How well were you able to attract attention to get funding for your work?

JB: Well, a lot of our funding came through the malarial research group through the Department of Defense – a lot of it.

AM: Is that like a program project grant?

JB: Yes. We went to the Department of Defense, and they were interested in G6PD, of course, for obvious reasons. A lot of that came from that. Eventually, I got some independent grants from NIH [National Institutes of Health]. Then I became part of the -- we had a genetics component. There were comprehensive sickle cell centers formed all over the United States, there were ten of them. Eventually, I was head of one group at the University of Chicago, so a lot of our funding for ten years came through that. We lost that grant, so that was defunct.

But I did other things on an individual basis. The main reason why we lost our grant is one of the great triumphs of my career. We started asking questions about bone marrow transplantation [to treat] sickle cell anemia, and I proposed, as part of our center, to look at the possibility of bone marrow transplantation for sickle cell anemia, because it was beginning [to be performed] by the French on immigrants from Zaire. Bone marrow transplantation would be very nice to do to see if we could cure sickle cell anemia[91].

Well, I had never seen a critique as that on my [proposal], and it was absolutely horrible. It said, "How could he do that? This is absolute nonsense - bone marrow transplantation for sickle cell anemia?" And the whole thing was turned down. I said, "Okay."

Ten years later, NIH wanted to have a consensus conference about bone marrow transplantation for sickle cell anemia. A lot of these consensus conferences are organized by the powers that be. They know what they want to do. They want to call experts to agree with them. I was asked, interestingly enough, to chair a section on ethical issues of bone marrow transplantation. I was invited to do that. What I did, I started off and I said, "I have something I want to read to you." I read the critique in which [my grant] was turned down. And in the audience - most of the reviewers of my grant were there. I read the whole critique to them, and I sat down. (laughs)

AM: What was their reaction?

[91] Sickle Cell Anemia is a mutation in the hemoglobin gene can cause this blood disease where the blood cells are shaped abnormally and causes clotting and other complications.

JB: I had so much fun. Well, what could they say? Eventually, I was asked -- and I still am part of the advisory group for bone marrow transplantation for sickle cell anemia, and I've done all sorts of cancer things with stem cells, and what have you, and cord blood[92]. We've done all of that. Every time I go to a meeting, I remind what they turned down twenty years ago. (laughs)

AM: How do you explain that initial rejection?

JB: A very sad thing was told to me by the head of the National Sickle Cell [Disease] Program. She said, "Jimmy, you were too soon." I said, "That's disgraceful. What is research supposed to do? It's before. It's not after the fact. You have to start somewhere." She said, "You were just too soon." (laughter)

AM: I'm going to ask you a counterfactual question, which is generally not a very good thing to do but I'm going to do it anyway. If you had still been in Shiraz, maybe your research would have gone in a different direction, but because funding is done differently in different countries, or perhaps if you had stayed in England, do you think that the project for bone marrow transplantation would have been received differently?

JB: Yes, because right now, in Shiraz -- and I went back again -- one of my former students is named [Mansour] Haghshenas. He's a hematologist. He came to the United States, he did research, and then he went back as head of hematology there. They have an extensive bone marrow transplantation for thalassemia[93].

Oh, that's a wonderful story. When we were there, we saw thalassemia, and I'd never seen thalassemia before. We had hordes of patients with thalassemia. They were doing intermittent transfusions of thalassemics and all of that. We started [treating] thalassemia there. Now, the Institute Pasteur[94] [of Iran] in Tehran started before Haghshenas was here and went back. They had a large program that they were initiating screenings for thalassemia in Tehran, Isfahan, and Shiraz.

What they do now -- it is very really controlled. Before marriage happens, they test people, and if both prospective parents have thalassemia traits, they are discouraged from marrying. Haghshenas has a very large bone marrow transplantation system in Shiraz, and I saw a large one in Isfahan – [a] bone marrow transplantation [system] there. So they're doing it there – [treating] thalassemia - starting to do it. But they're

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[92] Cord blood is blood obtained from the umbilical cord at birth. It contains stem cells which can be used to treat genetic and blood disorders.

[93] Thalassemia is a group of inherited autosomal blood disease which results in malformed hemoglobin and therefore anemia. For more information on thalassemia see http://www.thalassemia.org/index.php?option=com_content&view=article&id=19&Itemid=27.

[94] Pasteur Institute of Iran is a scientific research center which seeks to advance medical research against disease in Iran. See their website at http://www.pasteur.ac.ir/

also -- they hope that eventually thalassemia will disappear, because technically, before you get married -- there's no such thing as mating outside of marriage. That's discouraged in various ways that I won't talk about. (chuckles)

AM: Okay. Just one last question. I apologize for jumping around so much. We can come back to it tomorrow.

JB: Well, I've jumped around, too.

AM: One last question I'll ask to wrap up for today. It's a little bit of a tangent to what we were talking about. When you had finished up your medical training and decided to take the job in Iran, you had mentioned that you had become disaffected with the United States.

JB: Yes.

AM: You also talked yesterday about how you were witnessing some very key events in American history -- the Civil Rights Movement -- from Iran. When you came back to Chicago, clearly the early sixties was beginning, a very culturally revolutionary time in the United States.

JB: Oh, yes.

AM: Were you still disaffected, I guess, with the United States? And how had things changed while you were gone? How did your perspective on the United States change coming back to Chicago in the middle of what has been --

JB: Well, the real [big] things had not started when we came back. That came after. There were terrific effects as far as the university was concerned, at Columbia [University] and what have you, and the University of Chicago and what have you. Our students were jumping up and down around '68 or so, and they were protesting and marching here. There was not too much turmoil on the campus of the University of Chicago because the president of the University of Chicago -- the black students decided, "What we're going to do, we're going to occupy the administration building." Some of them said, "Maybe we're going to do that." I said, "Well, do what you want to do." The president of the university came around and looked at them, and he said, "Okay, fine. After eight hours, all of you who are still in this building will be suspended or expelled." That was it, as far as the University of Chicago.

Our students were quite - they *should* have been indignant. I mean, if one was not indignant, there was something wrong with them, just like our students today should be. We invited about a hundred -- that was all that was there -- to our house for lunch, and we sent out for chicken and pizza and what have you for them. Some of our most radical students were there. And I knew all of them, they knew me. One man was an

absolutely horrible person. He was a graduate student. He had been part of the group that tried to poison the Philadelphia Police Department. They had a luncheon, or something like that. I knew about him. He got out of it but he was one of the revolutionaries.

They were sitting in my library there, and the doors were closed and I walked in there and he said, "Dr. Bowman, you don't want to come in here. We're talking revolution." I said, "Ok, that's all right, you're talking revolution." And he said, "We're gonna overthrow this government and do all sorts of things." I said, "Okay, fine." I said, "Well, just remember there are about ten in this room, more than likely, at least two or three of you are informers to the FBI." They said, "Oh, no, no doctor. We'd never do that." And I looked at this guy whom I didn't like. I said, "Suppose one of you had tried to poison a police department?" They didn't know that I knew it. The students don't think the professors know these things. I said, "Suppose one of you tried to poison a police department somewhere. Do you know what I would do if I were the FBI? I would go to him [the poisoner] and say, "Now, look, this is what you're going to do. You must tell me everything that's going on with those radical students. And if you don't I'm going to put you in jail." They looked at him, and I looked at them and smiled. I said, "Now, if there are no informers in here, then shame on you, because you're not important," (laughs) and I walked out. Well, they were young and -- I said, "You must remember, if you're going to do things like this, then you're going to be infiltrated. As students at the University of Chicago, you're smart enough to know that."

I'll get to the Black Panthers[95] later with sickle cell anemia. That's when they went off with -- one of our congressmen[96], of course, was head of the Black Panthers here in Chicago.

It was very exciting days. Some of this we heard in Iran. I told you that during Little Rock -- I think I mentioned it already. Some of these things were going on. It was very exciting days.

AM: Did you have a sense that things were changing in the United States from before you left for Iran?

JB: No. I didn't think so, no. Segregation was abolished, as I mentioned, in the District of Columbia. But we didn't have much contact -- well, we read *Time* magazine and we got international edition of the [*Chicago*] *Tribune* and we had radio, so we knew what

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[95] Black Panthers were a radical African American civil rights organization founded to protect African Americans from police brutality and to promote racial equality. Some of their methods were controversial. To learn more, see the website at: http://www.blackpanther.org/legacynew.htm

[96] Bobby L. Rush co-founded the Illinois Black Panther Party in 1968 and is now a congressman in Illinois.

was going on. But there were a lot of things that we did not know about very much [about] until we got back to the United States.

AM: Okay. Well, I think we've covered a lot of ground and we'll pick up tomorrow.

JB: Okay, all right.

Session III – June 28th 2006

AM: It is June 28th, 2006, and I'm with Dr. James Bowman at his home in Chicago. I'm Andrea Maestrejuan to finish - this is the last session of his oral history interview for the UCLA Human Genetics Oral History Project. I'm going to start off basically where we left off yesterday. When you came back, you left the Galton Lab and had the position in Chicago as the director of blood bank.

JB: Yes, I was director of the blood bank and eventually I became director of the laboratories too.

AM: In terms of your own research, I know by looking at your publications that you basically pick up with your G6PD research.

JB: Yes, I did.

AM: This continues for a few years and expands to encompass more hemoglobinopathies[97], generally and specifically sickle cell [anemia].

JB: Yes.

AM: Talk about how your research program started here at Chicago and then it was transformed into really focusing on sickle cell anemia.

JB: Yes. As I said, I was part of the University of Chicago Malarial Research Unit. They were, of course, heavily involved in glucose-6-phosphate dehydrogenase deficiency and glutathione reductase deficiency[98]. As often happens when you start testing, you always test yourself. All of a sudden I realized, and I never knew it beforehand, that I was heterozygous [Hb] AC. I said, "Well, that is very interesting." More than likely some of my ancestors were probably in Ghana, and maybe northern Ghana, which has the highest incidence in the world. Alright, I'm AC. Of course, I had no problems with it because it's completely innocuous.

[97]Hemoglobinopathies are genetic conditions where one of the globin chains of the hemoglobin protein is deformed. Examples of hemoglobinopathies include thalassemia and sickle cell disease.

[98] Glutathione reductase deficiency is a condition which causes hemolytic anemia due to malfunction in the enzyme glutathione reductase.

And also in discussing I found that I had glutathione reductase deficiency, sort of the intermediate type, and I had had no problems whatsoever. But if I took primaquine in large doses it would [make me sick] -- and I didn't know that. It was one of those things, you start testing yourself and you find out things about yourself.

As part of our program, we decided that we were going to do population studies in the United States. And as part of the G6PD deficiency, *en passant*, we were doing testing for starch gel electrophoresis[99] hemoglobins, and if the hemoglobins are there, you might as well look at them. So I started looking at things with sickle hemoglobin in various parts of the United States, and looking at differences among the African Americans, and others, too - some Greeks and Italians.

Then we decided what we would do, we started looking at other enzymes. Suddenly, *en passant* [we found] there was one of them, adenylate kinase, which is rather interesting as far as polymorphisms[100] are concerned. We started looking at that, and it's very interesting from the standpoint of what happens, because as we were doing population studies for adenylate kinase, it was obvious that as far as European Americans were concerned, a high proportion were heterozygous, but we could find very little amongst African Americans. Aha! That's very interesting. Maybe we'll have to go to Africa and look at them.

But trying to work out the genetics of adenylate kinase, I went all around the country and places. I found a family, and I won't mention where they are and what have you. We said, "Oh, this is the perfect family to work out genetics," because it was not known at that time and was very straightforward. Paul Carson happened to be in Maryland, and he had heard about a family that was there, because this family was related to the family that we were working –- we were looking at studies in European Americans here, and their families were in Minnesota and also in Chicago. They said, "But we have some families in Baltimore." We were trying to work out the genetics, and we were unsuccessful. All of a sudden, Paul Carson sent back some blood, from this family and there it was. The genetics was clear.

When we do things like -- when we go in to families, we always let them know that other things will come up and we may find paternity is not [as expected] – [maybe] the father's not [who they think it is], or the mother, what have you. And this is part of the counseling beforehand - to let them know. And we told them that this was completely innocuous and it's still scientific, and if there's a polymorphism in your family, it doesn't matter. Well, the sample was sent back to us and the first born child - the father [of the

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[99] Starch gel electrophoresis is a biological technique used to separate a mixture (such as DNA, RNA, and various protein molecules) in a stationary gel base in an electrical base.

[100] A polymorphism is where two or more different observable traits are seen in a population. i.e. there are different observable blood types in the human population.

family] was not the father of the first born child, and that often happens with the first born child. We checked this ABO blood group and other things, and the same thing came out. It was a confirmation.

Well, what should we do? It was a very nice family. Paul said, "This is a very loving family, and I'm positive that she doesn't know". So what should we do? I said, "We're not going to send the report." She called me and said, "Dr. Bowman, you're so nice, all the studies you were doing, and your friend was here working, and you haven't given me a report." I said, "I'm very sorry, but your blood was lost in the centrifuge." I did not hesitate to lie. I mean, I'm not going to destroy this family. Obviously, she doesn't know it, and he doesn't know it, and why should I destroy a family? She called back and said, "Oh, Dr. Bowman, I'm so sorry. You did so much work. I'll send you more samples." And she sent me some more samples. You know what I did? I said, "I'm very sorry, but the technician dropped it." For about five minutes she cursed me out, and said, "All the time we've spent on all of this, and how could you do something like that?" And I apologized.

We never reported that section of the family. We worked for about another year to find another family that was perfect like that we reported on the adenalate polymorphism.

I had been taken to task by some people about this. "How could you do something like that?" I said, "Look, as far as I'm concerned, I'm am not going to do harm. Do no harm.[101]"

AM: A colleague of yours in one of the edited volumes that I was reading, he was at King-Drew [Martin Luther King, Jr./Charles R. Drew Medical Center], ran into a very similar situation. He was trying to - in this article - give some guidelines, because this is not uncommon.

JB: Oh, no. [It's not.]

AM: In his example, he said if there is a question of paternity, generally you can have the first person -- because you can destroy families and this is a very sensitive issue. He felt, though, that the mother should be informed one way or the other, but in a context in which she alone can decide what happens.

JB: Yes.

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[101] 'Do no harm' comes from the Latin phrase *primum non nocere*, meaning "First, do no harm." Dr. Bowman is referring to this maxim as a principal of medical ethics. The idea is that "given an existing problem, it may be better not to do something, or even to do nothing, than to risk causing more harm than good."

AM: We'll talk a little bit more about this, the philosophies of genetic counseling.[102] Why did you choose then to withhold all information rather than disclose it to certain parties? Or minimize the exposure--?

JB: If I find in a family -- and it has happened -- that I'm personally in contact with them, and it's important medically, *then* I talk to the mother. And this has happened – [where the baby had] sickle cell trait, HsBC, and the mother had HbAC and the father was HbAA. I would say, "Now, look. This is important." And invariably she says, "I knew it." And that's it. But if it is clinically important- of course [I tell them]. I had no contact with the woman, I was not there, I could not sit and talk with her, size her up. Before you start this you must be very gentle. And often times they will tell you- the mother [will]. [But in this case] it was of no consequence whatsoever. So that's the reason why I did it. And I would do it again.

AM: Okay. Because this comes up in many of these interviews -- genetic counseling really didn't come into its -- certainly in the forties and fifties, a lot of genetic counseling was being done by either clinically or basic science trained geneticists. It's not until the late seventies that professional organizations form to certify genetic counselors. How were you being trained to deal with all these issues arising because of these new genetic technologies that allow for genetic testing and understanding of genetic disease?

JB: Well, you can read and practice. I did a *lot* of this in Iran. As I explained, before I went there, and then afterwards we did population studies. We sent the information. But it's one of those things that -- I mean, I did it. I was here, and I was director of the laboratories, and I was in charge of the screening for hemoglobin and G6PD and what have you. I was the genetic counselor. When we started newborn screening, there was a big issue about newborn screening and should you tell the parents if there's no sickle cell disease. Should you do that? Now, there are some physicians, and I will not mention them, and they published this. They said, "If we find only sickle cell trait, we do not tell them. If it's sickle cell anemia or part of a disease, we sit down and talk with them."

I disagreed with that because I felt that if we tested for something like sickle hemoglobin it would be very very important – I'll never forget, a mother we tested and we did not test the father and the mother had hemoglobin C. She said, "Oh, somebody told my husband that he had sickle cell trait." I went into the family with all of that [information] because it is extremely important. There are many genetic counselors who would not bother about hemoglobin C but it has medical consequences, if there is a chance the

[102] Genetic Counseling is the counseling of individuals and families concerned about different genetic disorders and their consequences upon the family/individual in question.

other one has AC and you should know it. As far as counseling for sickle cell and newborn screening I think it is very important to let them know everything. Because later on they would hear nonsense about sickle cell trait - which we will talk about in much more detail. So I did practically all the counseling and screening myself.

Oh, I'll never forget talking to a young lady who was fifteen years of age, and she was not married. She had a child we had found that had sickle cell anemia. I was counseling her about her boyfriend, and she said, "He won't be tested or anything else like that." I spent an hour talking with her about having sickle cell anemia, and how if they had another child they might have another child with sickle cell anemia. She had the equivalent of a third grade education. She was about fourteen years old. And I knew that she didn't understand anything that I said. If I went into detail I felt foolish.

Finally, as she left, do you know what she said to me? "Dr. Bowman, I'm not going to go to bed with that boy anymore." She had gotten the message. That was all. She never could have told me about the genetics but she said, "I'm not going to go to bed with him anymore." And that was it.

AM: Among geneticists at this time there was some debate between directive and non-directive counseling. Where did you fall in this debate?

JB: Well, I don't know. I would not tell them what to do. I would give them the information - yes – but I would not say to them, "I wouldn't have this child." I do not tell people what to do. Whether or not the next time they should have an abortion or not—it's up to them as far as I am concerned. As far as directive and indirective, I think you have to analyze the situation and take time to understand what's going on in the family. Often times you have to just play it by ear because each family is different.

AM: And how were you training your students and your colleagues who were also getting involved in these issues? How were you training them to deal with not only the social and cultural differences within US American communities, but also you were taking samples internationally as well.

JB: Well, as far as informal lectures, or things like that, I said it's very important to, as I said, understand the family, understand -- you have to know something about African Americans, poor or wealthy – I mean – they are different. You're talking to Jews, you're talking to Puerto Ricans, possibly there may not be any difference at all but you have to size them up. People are different. One of the advantages I had when I started dealing with complex ethical issues was I had traveled the world, I had been to Africa, I had lived in the Middle East for six years, I lived in England, I lived in the United States and knew people [from all over]. You have to deal with people *as they are*. I tell my students, I give the examples, I said, "If you're going to live in a Muslim country, read the Quran. Whether you're religious or not, read the Quran."

When I lived in Iran, I read the Quran over and over again. I'll never forget - I was giving a lecture in Saudi Arabia. I was talking about anthropology and genetics and things like that. An elderly man stood up and said, "But, Professor Bowman, you didn't tell us about Adam and Eve." I had read the Quran. If I had said anything about my own feelings about Adam and Eve, I could have been killed right there because I knew that as far as a Muslim is concerned, Adam and Eve are venerated. You just do not do [speak disrespectfully about Adam and Eve]! If you going into a group - I don't care [who] - if you are talking to Jews you must know something about their religion. You should understand what they believe, whether they be orthodox, or not, or Sephardic, or Ashkenazim. I think that is most important and I tried to get this [message] to our students. And I talk to people who do this and I also say don't necessarily go by the book because some rules may not work in a situation. Counseling is not necessarily, "Do this, do this." Size up the situation and try to resolve your interaction for the best of the people you are counseling. So I generalize but I am specific if it is necessary.

I'll never forget a woman who came in who had sickle cell trait, and her husband had sickle cell trait. She said, "I don't want to have a baby with sickle cell trait." So we did all sorts of things. I said, "There's nothing wrong with sickle cell trait, it's sickle cell anemia you have to worry about and disease like that." She said, "Ok." So we did all sorts of things with her, and a prenatal diagnosis was done on her and [the fetus had sickle cell anemia]. She said, "I want an abortion. I do not want a child with sickle cell anemia." She consulted her mother. Her mother said, "You must not kill that child." She said, "Mom, I'm going to do it." She had an abortion, and she developed a severe infection. As she lay dying, her mother came to the hospital and cursed her daughter and said, "It serves you right." You can't anticipate something like that.

I feel for the families that I talk to and I try to understand where they are coming from and what is important to them.

AM: How successful do you think you've been in training the next generation to be culturally sensitive, when at the same time they're learning about a science which is generally seen as objective. We teach science as an objective, impassionate form of knowledge creation, and yet it's being applied -- particularly with genetics technology, genetic knowledge - applied within a particular specific cultural and social and political and economic situation. How successful do you think you've been able to train the next generation?

JB: I don't know. I have no idea whether it gets to them or not. I don't know. I hope so. Professors hope -- but at the same time, I understand that as far as the next generation, they have different problems and different aspirations, or the conditions are completely different. Prenatal diagnosis is here, it's here to stay, it's going to be done. Abortion's

going to be done no matter what happens. It's a different world. And the time will come when we will able to do stem cell[103] therapy too - beautifully.

I'm a scientist, but at the same time I have to be human, too, at the same time. I try to understand people, and they are different, and they think differently, and oftentimes you can't change them. And you shouldn't. But I get very, very upset -- oftentimes I say I don't want to be dogmatic - but I'm very, very, very upset about the restrictions on stem cell research and embryos. I think it's absolutely disgraceful.

I'll never forget the former Surgeon General, Jocelyn Elders.[104] She has a statement which is classic, which I've repeated over and over again which is, "There are some people who have a love affair with fetuses, but do not give a damn about them once they're born." That's a powerful statement.

AM: It is. We're going to be jumping around.

JB: Yes. I'm jumping around back and forth too.

AM: I want to jump ahead here a little bit because of your last comments. By the mid-seventies, I think it's safe to say that your focus was becoming less and less on basic science and research and moving more toward advocacy and exploring the ethical and social and legal implications of screening programs, particularly with sickle cell. You just mentioned stem cell research, because it is now our current ethical dilemma between what scientists can hope to do and what the government -- it's exploring and regulating the limits of scientific knowledge, which in the seventies was really about genetic testing.

You argued that this new genetic testing has the specter of a new kind of eugenics, and much of your writing evokes images of the Holocaust in Nazi German, of the early eugenics practices of the twenties and thirties in the United States of sterilization laws at the Tuskegee Institute Syphilis Study.[105] Yet, in the conclusion of many of your articles, you would say that genetics knowledge -- we must still pursue the science.

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[103] Stem Cells are types of cells can differentiate into any type of cell. There are two types, embryonic stem cells and adult stem cells. Opponents of stem cell research argue that it is a slippery slope to cloning and it requires the death of embryo (to obtain embryonic stem cell lines). However, adult cell lines have been shown to be manipulated into embryonic like lines.

[104] Jocelyn Elders was the first African American to become Surgeon General. She is currently a Professor of Pediatrics at the University of Arkansas Medical School.

[105] Tuskegee Syphilis Study was a research study on African Americans that became known for its unethical practices. The study aimed to research syphilis that was left untreated in African American males. However the researchers failed to notify them that they had the disease and denied them treatment even when the subjects were close to death. For more information see http://www.npr.org/programs/morning/features/2002/jul/tuskegee/.

JB: Of course, yes.

AM: How do we bridge this gap? Because we're still in a period in which genetics knowledge is still outpacing the ethical issues involved and moral issues in discussions, that there's an increasing gap, it seems to me, or at least the gap still exists between the kinds of knowledge that scientists create and the implications of that knowledge. Considering that you were at the forefront of this work, particularly for sickle cell screening in the seventies, and yet, in the beginning of the twenty-first century we're now confronted with a new kind of issue with stem cell research. How much has changed? What difference is there?

JB: A lot has changed. And oftentimes things never change, and sometimes they do. As far as I'm concerned scientific discovery is going to be done, either in the United States or someplace else. It is going to be done. Ethicists, theologians, presidents, dictators have tried throughout the century to stop scientific discovery, and it will not happen. It will be done. Of course, would we, for example, let's say -- I'll give you a classic example. Look at the wheel. The wheel, something as simple as the wheel, has done so much good through the centuries, but the wheel has also done harm. Are we going to say, okay, we'll never use the wheel – in anything! That would be impossible. Everything that we oftentimes discover, it happens for good and also there's harm, too. There's not much we can do about it. We wouldn't have airplanes, and we wouldn't have cars. Cars have accidents. Airplanes crash. People die.

So I think, as far as science is concerned - and I get very upset - though I've written about ethics, a lot of ethics is politics. I can predict what my colleagues are going to do. I've been on councils - I know what you're going to say and what you're going to do. But it's politics, most of is politics. For example the Morning-After Pill.[106] I know why the FDA and all of that -- it's politics! It's President Bush, he doesn't want it. He does not want it. And they can rationalize. It is going to be done. I used the Morning After Pill in Iran on dogs! I read in the veterinarian journal [about giving dogs the] pill. Friends of mine had dogs and [the dogs] were female. They said, "Oh my, [the dog] was out there loose and a male [dog] was there and they had intercourse!" I gave them the morning after pill in 1956. It's been known.

As far as I'm concerned, we're not going to get rid of nuclear power. It does harm, but it does good too. I am very firm as far as the limits. I think there are no limits as far as research is concerned on stem cell research, because one of these days, with this information, we will be able to eliminate most of the diseases that we know about. And

[106] 129. The Morning After Pill is a pill meant to be taken post-coital that prevents ovulation or implantation of the blastocyst. The introduction of the pill incited controversy in the United States as pro-life supporters of the abortion debate argued that it is a type of abortion and should not be allowed to be bought over the counter.

the only diseases that will be left will be killing and suicide. Humans will always be inhumane to each other. As far as I'm concerned I think scientific advancements are treasures - I love it - and when I hear about restrictions on science, it is usually political or religious[ly motivated].

AM: You had mentioned before -- because the political nature of your work seems to me to be a striking theme in the last couple of days that we've been talking. Even in Iran, when you were going out to the different ethnic groups and communities, and you had somebody whispering in your ear about the Shah and the politics, that none of the science or the human and medical genetics that you've done has not been within a political context. In what ways is science not political, and in what ways is it always going to be political, and what is the role of the individual geneticist in understanding the political nature of everything you do? Because [Jonathan] Beckwith[107] wanted to say the physicists had to deal with the moral implications of their work with the nuclear weapons, and they did so much better than the geneticists had. Would you agree with that?

JB: Well, you mean the Asilomar Agreement[108] -- no, that was absolutely -- they met together, and [decided] certain things that were going to be banned and we're not going to do [them]. And that was absolutely disgraceful and they were wrong. Because it's going to be done. Now, you might say, "I don't have to do it myself," but we oftentimes are arrogant. Do you think that a bunch of people who are scientists and they're friends with each other, they're going to sit and decide what the world is going to do? No. Look at the Chinese, look at the Japanese, look at the Koreans, what's going on in England. Look at Dolly[109] - I mean, that was in Scotland. People said, "What happened? What happened? They did it! They did it!" It was done. And it's going to be done. There's going to be hundreds of Dollys all over the world. We're still doing it. Okay, yes. Well, that's bad, too, but oftentimes there's a lot of good will come out of it, too. I firmly believe that there should be no restrictions whatsoever on scientific discovery, because it's impossible to do. It's going to be done.

Talking about eugenics, and I've written of it a lot. I'm writing another book, and I said, "Eugenics never dies." Eugenics has been with us since the beginning of time, through the Greeks. Oftentimes, geneticists do not like to use the word eugenics. But I say, "But you are a eugenicist. If you're doing genetic counseling and prenatal diagnosis and

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[107] Jonathan Beckwith is an American microbiologist and geneticist who is noted for isolating the first gene from a bacterial chromosome and has been involved in bringing to light the social implications of science.

[108] Asilomar Conference on Recombinant DNA, conducted in 1975, established guidelines on how to regulate biotechnology. It is noted that because of this conference, the public has been more informed about recombinant DNA and its consequences.

[109] Dolly, a sheep, was the first mammal to be cloned in 1996. She was created via transfer of an adult somatic cell into an oocyte.

abortion, that's eugenics." "Oh, no, that's not eugenics." It is! We don't like to admit these things.

AM: And why is that? And this is to go back to what you said, we can't put restrictions on genetic discoveries because our goal is to eliminate disease, to the point that we can at least eliminate everything except poor human behavior, in the case of murder or suicide. But within that context -- because just saying that --- depending on how you look at eugenics, can you produce any kind of genetic knowledge that does not have some kind of eugenics overtones?

JB: Yes. I mean, it may have had its overtones. It might be subtle. But it's there. Prenatal diagnosis is here to stay. Abortion, no matter what, it's going to be done. There are people who are against it, of course, and they're trying to restrict it. But what happens, a woman will -- if abortion is eliminated in one state, they'll go back to the old days. Women would go to another state. And it's going to be done. And I think that is shameful too.

I cannot predict the future. I don't want to ban the future, because I can't. I don't know, I suppose that's a simplistic way of looking at it. I love science, I love discovery. We cannot restrict discovery.

AM: What is the role of the individual geneticist in mediating the different aspects of their work, of their actions, and that's creating genetic knowledge and understanding the implications?

JB: I've been on American Society of Human Genetics[110] committees. Oftentimes we may pontificate amongst ourselves. But I often look around and say, "What is your point?" I know exactly – and I will not mention names -- what they are going to say – with their own ethics and it is coming out. I just believe that to pontificate and make rules in a selective group, and then expect the world to listen, is absolute nonsense. They feel good, but it's not going to be done.

AM: Should we throw the term eugenics out? We've talked about, and you've written about the "old eugenics" and the "new eugenics" The positive and negative, passive and active. Should we just throw -- or can we rehabilitate the term eugenics in order to promote genetic technology in a positive and health and safe and culturally sensitive way?

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[110] American Society of Human Genetics, founded in 1984, is a professional organization for human geneticists and those who are related to the study thereof. For more information, visit their website at http://www.ashg.org/.

JB: Some of the old eugenicists were people that said, "What we're doing is, we want to look at the future, to have a better society." Some of the staunchest eugenicists in the nineteenth century were Jews. Just before Hitler, they affirmed eugenics' improvement of humankind. I don't think you can improve humankind. I mean, we are completely hopeless. I think there will always be the haves and the have-nots. We cannot get rid of that. If they want to call genetic counseling or genetic discovery or prenatal diagnosis or genetic testing, eugenics, okay, as far as I'm concerned. I'm not bothered by that word. I know it has a bad connotation, but I think we must admit that it is eugenics. It is. We might discard the word - yes. Ok, fine - but *I* can't do it.

I don't like to make firm points unless I think it is *strictly* scientific, like when we were going to get into the point about sickle hemoglobin and testing. That's where we've had problems. Often times I start [researching] something because of what has happened. I was sitting in my office minding my own business and my secretary said, "Dr. Bowman, members of the Black Panther Party would like to come and talk to you. They're outside and want to talk to you." And her eyes were hard. I said, "Well, have them come in! If they've come here, they want to talk about something. I don't care who they are."

There was a man and a woman who came in and sat down and talked about the screening program for sickle cell anemia. I'd heard about it. It was done with permission of the public schools of Chicago. It was absolutely horrible. They were using a test that didn't delineate sickle cell trait from sickle cell *disease*. She said, "Dr. Bowman, we have studied fifteen thousand children in Chicago, and we've found that about ten percent of these children have sickle cell disease, and we told their mothers they're going to be dead before the age of twenty." I said, "That's absolutely disgraceful. You're wrong. Maybe ten percent had sickle cell trait, but it was not sickle cell anemia."

They said, "Well, Dr. Bowman, there's a big conference of community groups, including the Black Panthers, and they'd like you to talk to them."

I talked to this group and I heard what they said. I said "This is nonsense." I said, "It's disgraceful. [You said] fifteen thousand and about ten percent the children would be dead by the age of twenty. That's not true!" You know what they said to me? "Well, Dr. Bowman, we don't believe you because you're on the faculty at that racist University of Chicago." And you know what I said to them? I looked them right in the eye and I said, "Well, if I were a member of the Ku Klux Klan, I would support your program." The Black Panthers were shocked that I had the nerve to say that to them. But it was true.

The National Institutes of Health had a brochure that did not delineate sickle cell trait from sickle cell anemia. And it was in writing. And I blasted them. I said, "This is horrible." I mean, they were responsible for the National Sickle Cell Anemia Control

Act.[111] I said, "The Sickle Cell Anemia Control Act, but how are you going to control something like that?" They said, "Two million African Americans have sickle cell anemia." I said, "It's not two million that have sickle cell anemia, they probably have sickle cell trait." And this is in *writing* that they put in the Control Act. And this is HEW [United States Department of Health, Education, and Welfare].

AM: Right. A lot of your work from the seventies onwards has focused on these scenes and one thing I wasn't clear about was who was advising the state and federal governments?

JB: I don't know.

AM: The NIH, I could only assume, must have had technical advisors. If you look at the effects of radiation, congressional committees were called, and the foremost scientists, geneticists were involved, and even classical geneticists, like [Herman J.] Muller[112], [James V.] Neel, [Barton] Childs, [H. Bentley] Glass,[113] all of those geneticists were called in to testify in front of Congress to discuss this issue of standards for radiation exposure - before they issued any standards. That doesn't mean it wasn't political or there wasn't a lot of disagreement over what these standards would be. But who was forming these advisory groups? Or was it completely lacking in the case of sickle cell anemia screening, and trait screening?

JB: I don't – well nonsense oftentimes evolves. And there are many sources. (chuckles) A screening test, the solubility test[114] was developed, but did not delineate sickle cell trait from sickle cell disease. It was known since [William B.] Castle's group [at Harvard Medical School] that you could do this. It was commercialized by Ortho Pharmaceutical [Corporation], which was a part of Johnson & Johnson. And it was sold -- I could devise it in my laboratory for two cents and they charged something like ten or fifteen dollars a test.

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[111] National Sickle Cell Anemia Control Act was passed in 1972. The goal of the act was to educate the public on Sickle Cell disease and to focus on ways to reduce mortality from it. However the process went awry and was criticized for distributing incorrect information.

[112] Herman J. Muller (1890–1967) was a highly noted American geneticist who was awarded the Nobel Prize in Physiology or Medicine for displaying artificial mutations that can occur as a result of X-ray manipulation. See http://nobelprize.org/nobel_prizes/medicine/laureates/1946/muller-bio.html.

[113] Hiram Bentley Glass (1906–2005) was a prominent American biologist who was noted for his predictions on the nature of science in the future. He also served as President of the American Society for Human Genetics. nm interview with Dr. Glass is included in this collection.

[114] The Solubility Test relies on the fact that the malformed hemoglobin molecules are not soluble in phosphate buffers and thus are clearly distinct from normal hemoglobin molecules. This test does not distinguish if you have the trait or the disease.

The screening test was started by a number of African American sickle cell anemia organizations. They went to the community, and they sought money for their organization. And there were many of them. Many of them had no knowledge about sickle cell anemia or sickle cell trait or anything else. Oftentimes, it was money. I mean, they got money. They solicited in the communities. "We have a disease in our community, and whites don't care about us, and they want us to die of sickle cell anemia, and we're going to help you out." Many of them said that this is a secret, and this as been kept secret from us, and we're going to do something about it. I fought those organizations like mad. They said, “Jimmy Bowman you're talking nonsense.”

They also (during that time) they said that since sickle cell trait is such a horrible disease, and if [people] are flying, if they have sickle cell trait they will die. And they started talking about black [flight] attendants on airlines, testing them, for sickle cell trait, because you shouldn't be a flight attendant [if you have sickle cell trait]. At that time airlines had started having black attendants. At one time they didn't have any. So one of the insurance companies heard about this, and they upped insurance rates for persons who had sickle cell trait. If somebody happened to die on an athletic field, they said it was because of sickle cell trait. People were hit by police. And as you know, about two months ago, a black kid was killed in Miami by the police, and they found sickle cells in his blood. [They claimed,] "He died of sickle cell anemia." That was disgraceful. The medical examiner made the diagnosis. The medical examiner did it in Chicago and I fought them.

They did not read a paper[115] a long time ago by Darland and ‘the’ Castle - William B. Castle. It says, "In the presence of sickle red cells in the capillaries of formalin fixed tissues, though valid evidence of sickle cell trait, does not demonstrate that sickled cells were present during life." As I told them many times, the worst anoxia is death. If you have sickle cell trait, there will be sickling in the blood vessels. The medical examiners even today -- though a colleague gave a paper, and I was a co-author, before the National Association of Medical Examiners,[116] and it talked about sickle cells, and [mis-information is] still rampant today – people believe it.

I surveyed reports of people who were athletes with a friend of mine, Alfonso de Garay who was Director of the Genetic Atomic Energy Program. The 1968 Olympics was in Mexico. As you know, many parts of Mexico are 7,500 feet above [sea level], and I had

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[115] Darland, Geneva A. and William B. Castle, "A Simple and Rapid Method for Demonstrating Sickling of the Red Blood Cells: The Use of Reducing Agents." Journal of Laboratory and Clinical Medicine (1948) 33: 1082-088.

[116] National Association of Medical Examiners is a group of medical personnel who are associated with investigations into medical causes of death of interest in the United States. See their website: http://thename.org/index.php?option=com_frontpage&Itemid=1.

him study African athletes who came from there. A large proportion of them had sickle cell trait, and they exercised at 7000 and 9000 feet and no problem whatsoever.

AM: Yesterday on the news there was a young high school or college-age athlete that collapsed on the floor. I'm not going to give the details, but the primary cause of death was not -- they said it may have been complicated by sickle cell. After almost thirty-five years of advocacy, is there any context for the specific sickle cell trait and sickle cell disease in which it cannot be attached to these social and economic and political implications?

JB: I don't know. I can't answer that question. Oftentimes, people have made a diagnosis of sickle cell trait, but it's not sickle cell trait, it's sickle beta plus thalassemia in which you have a proportion of A [alpha], and they think it's sickle cell trait. And that's happened when it's actually sickle cell beta thalassemia, and they said, "Ah, you have sickle cell trait. That's why you have symptoms of jaundice, and painful crises…". From [that interaction with] the Black Panther Party -- that started my crusade. Here I was minding my own business! But the misconceptions are with us to this day.

AM: What effect did you have on your work with the Black Panthers and your screening within the African American communities? What specific effect did you have?

JB: Number one, I screamed about the school board and said make them stop it and that was stopped. But they had their own political agenda. They said this was something that the white community knows and we don't know anything about it and we are going to tell. In fact, I was very upset that they said – during the end of the war --- the Korean and the Vietnam War -- they said, "What we want to do is, we want to make absolutely certain that men who have sickle cell trait [do not] volunteer for the army, because we don't want them in the army." I was almost lynched because I was talking before a group of Black Panthers and I said, "You are preaching urban revolution, and [what] better training for an urban guerilla than to go in the army?" (chuckles) I said, "It doesn't make sense."

In Africa, when we went to Ghana and Nigeria (and a student went to Cameroon), that nonsense was not perpetuated by my African colleagues that lived with sickle cell anemia, that lived with sickle cell trait. There were many more persons who had sickle cell trait there and they (some of them) knew better. Now, there were charlatans everywhere. There was a [Ghanaian] colleague of mine who was running around Africa and said that he had a cure for sickle cell anemia. I went to a conference and he was preaching there. I said, "Well, that's absolute nonsense." Then about ten years later I got a call from Minister, Louis Farrakhan, the head of the national black Muslims [Nation of Islam Organization]. He said, "Professor Bowman, I hear you know something about sickle cell anemia, and there's an African who's visiting us. He has a cure for sickle cell

anemia, and I want to make an investment." I said, "Is that right?" I knew exactly who he was talking about. This fellow was from Ghana. [Farrakhan] said, "I want to talk about [his cure] at my house." I said, "All right, I'll do it." He said, "You're not worried about coming to my house?" I said, "Of course not. Why should I be worried?" In the back of my head I know the FBI is running round, so I don't need to be worried. (laughter)

I went there, and this old friend of mine, when I came in the door he looked at me, he looked shocked. He made his presentation, and I was very quiet. It came to questions, and there were some questions. I was being polite. Minister Farrakhan looked at me and said, "Professor Bowman, you're looking very wise but you're not saying anything." I told him, "Well, I know something about this history and I don't think it'll work, and I wouldn't advise you to invest in it." [I was] very open. The head of a local bank, who was black, jumped up and said, "Our bank is going to invest in that." I said, "Well, okay. I would never put my money in your bank," and I sat down. Two weeks later, I was in the airport and Louis Farrakhan was [there] surrounded by his men. He saw me, and he walked up to me and grinned, and said, "Professor Bowman, I got your message." (laughs) All sorts of things were put out as cures [for sickle cell anemia], and this happens everywhere.

AM: You've talked about Tay-Sachs [Disease][117] as one of a screening program. You haven't really mentioned it in any of your articles on PKU [Phenylketonuria][118] which seems to be a successful program, started a decade earlier than sickle cell.

JB: Yes, it is.

AM: How do you account that some screening programs actually turn out well, have fewer problems than say the sickle cell anemia?

JB: I don't know. I think it is the group and the population, as far as education – information first. The Tay-Sachs screening was successful and is successful because [Michael M.] Kaback and [John S.] O'Brien[119] at Hopkins did the right thing. Before they went to the community, or the synagogue, they [instituted] a period of education. I think

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[117] Tay-Sachs Disease is an autosomal recessive disease which causes large quantities of fatty cells to build up in the nerves of the brain. There is currently no treatment. For more information see http://www.ninds.nih.gov/disorders/taysachs/taysachs.htm.

[118] Phenylketonuria (PKU) is an autosomal recessive disorder which does not allow phenylketonuria to be metabolized in the body. Newborn screening for PKU was one of the first to be made mandatory.

[119] Michael M. Kaback and John S. O'Brien are professors at the University of California, San Diego and are forerunners in research on Tay Sachs Disease. Kaback and O'Brien developed a cost effective method of screening after discovering its genetic cause.

it took about a year before they started. So the group was informed beforehand, and that is very important. I think that's why -one reason why - it is so successful.

The most successful thing about Tay-Sachs Disease is amongst the orthodox Jews, because before you get married, the couples are tested, and if both are carriers, marriage is not permitted. You have to marry somebody who is not a carrier. There's a reduction in Tay-Sachs disease in the Orthodox community, I think in Brooklyn, also in Israel.

JB: So those are successful programs because of proper education. Another thing that's happening, too, is the day is coming when community education is going to be practically impossible because the day is going to come, and it is practically coming, too, where we can test for hundreds of disorders by screening. You can't possibly educate about every test that's going to come up, so what they're going to do is just [take] a drop of blood and do it [the tests] and then, after the fact, you'll come and talk about counseling. And that day is practically here. In fact, it is. We do not have to go through education and everything else before you do it. People are going to be tested beforehand and they will probably ask you, “Would you like to be tested?” You will be tested and after the fact you will find out.

Actually, that happened in Chicago. I talked to a group of obstetricians and gynecologists about testing pregnant women for sickle hemoglobin. I said, "Well, what we'll do is we'll start a period of education and counseling before." They said, "Dr. Bowman, we don't have time for that in a busy office. What we're going to do, we're going to test, and *then* if somebody had sickle hemoglobin, then we will counsel them." It was very sensible. They said, "We can't sit down with every patient that comes in in a day and start counseling them about sickle hemoglobin."

AM: This whole notion that we can screen for a variety of things and genetic differences within an individual genome - how does a geneticist bridge the gap between public understanding of genetic disease and genetic health and the knowledge that the geneticists are creating that is transforming our understanding of health and disease? You mentioned earlier that you had a patient that you were counseling who it was clear that her unborn child was positive for sickle cell trait but not sickle cell disease. Clearly, she was caught up in the idea that there was something wrong with her child, even though there is a big difference between having the trait and having the disease. What's the role of geneticists in transforming this understanding that we are going to have a lot of neutral or innocuous genetic differences?

JB: Oh, yes. That's the real world. In the early days, before we became so fancy, we said, "What we must do is we must start education in the schools as part of biology classes." I mean, that's one way to make people aware of the future. And it's

happening in biology classes. They talk genetics, they talk about sickle hemoglobin and other things. And that's as it should be. But they should not do what is done -- what has been done is that in some public schools they started testing children and drawing blood and have them to test their own blood - in class. Well, that's dangerous because a child will say, "Oh, I have sickle cell trait." And some of the teachers said, "Well, get your parents tested." That's dangerous because suppose he got the parents tested and neither parent had sickle hemoglobin, and he has it. Many schools started doing that. When you start doing things like that, you're going to involve the family, and it's dangerous.

I think education is important, and it will be part even more so eventually in schools, and people will be aware, those who are educated. The future is always there, it's always there. There are some things we can't do.

AM: In a little bit different context because this comes up quite a bit, because you've spent a lifetime of research on G6PD which led you to a whole variety of hemoglobinopathies and the kind of subtle and dramatic differences between diseases of genetics and diseases of hemoglobin, and how complex the genetics --

JB: Yes, very much so.

AM: Yet, we still can pick up a newspaper and see researchers say we've identified the obesity gene. We're going to *identify* the homosexuality gene, that there is one gene still out there that's going to reflect this phenotype. How do you explain that in this day of advanced genetic knowledge that there are still these kind of older ideas about how genetics works, that there's a genetic determinism in diseases and traits, and this may not necessarily --?

JB: Sometimes I try to make people a little bit more comfortable when they're talking about, well, we're going to find that this person has some abnormal -- I say, "Well, look, it has been established probably that more than likely we *all* are carriers of an assortment of genetic traits, and its full significance we do not know now." We do also, and you may find -- well, in the old days, they said you find that approximately six traits will be found in an individual. But that's life. Every variation that we see and discover is not necessarily harmful, it may be beneficial. But that's the future, and I love the future. (laughs)

AM: You mentioned yesterday that you lost a grant because you were premature, I think, is the word to use because--

JB: Yes, and plus, it's the best thing that ever happened to me. I keep talking about it.

AM: And it is the best thing that ever happened to you because?

JB: Because I was able to point out that as far as ideas [go] they should not be discarded. And the future is here. That's science. If I had not lost the grant, more than likely my life would be different. I would not have completed the book that I was writing, which I treasure. Okay.

AM: This is the [book]--?

JB: *Genetic Variations and Disorders in Peoples of African Origins*.[120] I enjoyed that and it was very important as far as my career was concerned, and my personal satisfaction. And I may not have done that beforehand. So I lost a grant. Everybody -- we all lose grants, it happens. But that doesn't mean that you should be defeated. Keep on. And that's life.

AM: In this case, how does the politics of scientific funding in the United States influence the kinds of genetic research that you've done, and how that information is disseminated?

JB: Oh it does. It's going to come out. That happens. I've been on advisory committees for the FDA [Food and Drug Administration] and for National Institutes of Health and other groups. I have been informed by the powers that be, often, "Remember, Jimmy Bowman, you're only advisory." And that's life. I was on an FDA[121] Advisory Committee. There was discussion about a carcinoembryonic antigen test,[122] years ago. Our advisory committee said, "No, this is nonsense, we don't think too much of it." The FDA administrators said, "Well, as far as the committee is concerned, we more than likely will overrule you." We knew that a major pharmaceutical company had given two million dollars to [Richard M.] Nixon's campaign, so we said it openly in the committee. The FDA administrator cut off the tape recorder and said, "We don't record it." And we insisted that it be recorded. It was funded, but at least we said no.

That happens. I've been told on NIH review committees, "Jimmy Bowman, you must remember that you're only advisory and it goes up to the administrator, to the head of the program, to Health and Human Services, oftentimes up to the President, and it can be overruled there." I suppose, okay, that's our political system of government. No advisory committee should feel themselves so important, [because] eventually politics will come in.

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[120] Bowman, JE and Murray, RF. *Genetic Variation and Disorders in Peoples of African Origin*. Johns Hopkins University Press, Baltimore, 1990.

[121] Food and Drug Administration (FDA) is a US governmental organization which regulates many consumer products such as cosmetics, food, vaccines, medical devices, and more. It is under the Department of Health and Human Services

[122] Carcinoembryonic Antigen Test detects cancer cells by using the protein carcinoembryonic antigen which is present in developing embryos naturally.

In many conferences with my philosopher colleagues, or ethicist colleagues, I say it depends on what system of ethics you're going to use, and they contradict each other. You look at utilitarianism, you look at Immanuel Kant, you look at Catholic dogma, Muslim - they're all different. Ethicists will ask if this is ethical or not. I said, "I depends upon what the situation is or who you're talking to."

A friend of a close friend of mine, [Sir] Bernard [A.O.] Williams, he's a utilitarian[123] philosopher, that I met through a colleague of mine who is now dead, Alex [E.] Boyo[124] from Nigeria, he was a fellow at King's College [University of Cambridge] at that time. He had been M.D., DPhil, Ph.D., but he was a fellow at King's College Cambridge with Bernard Williams. And he's written a classic book about for and against utilitarianism. One of the things that I oftentimes told him about the utilitarian documents --- and he said that a minority group should not accept utilitarianism, because if you're a minority, the greatest good for the greatest number will not be [to the advantage of a minority]. If you're a minority, it can turn against you. So often times we talk about ethics and ethical things, [but even] something as nice as utilitarian philosophy, which I think is one of the greatest ones – think of Jeremy Bentham[125] and the founders of it – but it can be used against people. Everything can be used against us.

I always like to talk about Jerry Bentham because when I was at University College London, they have his body, it's embalmed -- have you ever seen it?

AM: No.

JB: Oh, yes. He's there, embalmed, and he's dressed up. I think it's probably his skeleton covered up. It's not preserved like that. He is in a huge closet. Well, he's the founder of University College London. He said, "When I die, when you have a major problem among your trustees, dig my body out so I can sit with you and you'll be much more reasonable." (laughs) If you go to University College London -- I forget what you call them, but these [people in] fancy uniforms, if you visit there, they will drag him out. I'm going off the beaten path.

6. Genetics and Anthropology, Thoughts on the Human Genome Diversity Project, and Closing Remarks

[123] Utilitarianism is the philosophy that says something is good if it causes good for the general public and bad if it affects people negatively. It is the opposite of egoism that says that people should just focus on their own pleasure.

[124] Alex E. Boyo (1929-2004) was a clinical pathologist who has studied numerous diseases and was crucial in development of science of pathology in Nigeria. For more information see: http://munksroll.rcplondon.ac.uk/Biography/Details/5456.

[125] Jeremy Bentham was a British jurist who was a strong proponent of utilitarianism.

AM: That's okay. I'm going to be jumping around a bit myself as we wind things down. One thing I wanted to talk about is, in this day and age, informed consent and HIPAA [Health Insurance Portability and Accountability Act][126] rules, could you have done the same kind of genetic work that you did in the sixties and seventies by using blood samples from University of Chicago employees? I know in some of your papers you used blood samples from the state prison here in Joliet.

JB: Yes.

AM: You've used even the sampling of going to different parts of the world, villages in Mexico and Africa. Could you have done the same kind of work given that now we've put into place more regulations over what --

JB: Maybe not. Some of the things that we were doing were strictly population genetics. It wasn't for counseling. [We were] trying to determine this particular enzyme - the genetics of it. Like [6] phosphogluconic dehydrogenase.[127] We probably could not have [done the same kind of work].

When we were in Africa, when we were testing, we could not do individual counseling - if you're doing population studies. But we did the closest thing we could do which is to have the group there -- as I mentioned in Iran -- and talk to them, [explain] what we're going to do and why we're going to do it.

Sometimes that is very, very difficult, and you have to be careful. Once I was in southern Ethiopia and we went into a marketplace. My Ethiopian colleagues were with us. I never went by myself, of course. Went to this marketplace to draw blood because we were looking for genetic disorders in hemoglobins and enzymes in this area. My colleague said, "Well, you can go to this market and talk to the group, have them do it." My colleagues from the medical school called a group together and said the doctor is here and [explained] the reason why we were going to do it.

One man came up and held his arm out. He was very quick, and I was very suspicious. I was going to draw his blood (he had good veins). I always do [people] with good veins. I pick those that have good veins first. Otherwise, if you miss one, the rest of them will run away.

AM: So random sampling --

JB: As I've said, there's no such thing as a random sample. It's those people who *agree* to be tested. There's no such thing as a human random sample.

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[126] Health Insurance Portability and Accountability Act, drafted in 1996, ensures that patients have a right to medical privacy as well as establishing health care standards.

[127] 6-phosphogluconic dehydrogenase is another name for G6PD.

AM: Those who agree to be tested and those who have good veins.

JB: Yes, that's right, and good veins. Now, later on, if we have no problems, we'll go with the poor veins after we have good veins. I got my needle out and plunger, and *before* I stuck it, [the man] jumped up and down and started screaming. He said, "This doctor, this American is going to kill me," and he fell on the ground. He said, "They have come here to kill me!" He was trying to start a riot. The only thing I said was, "Malesh." It's an Arabic word which you can't translate [literally]. It means "Well, what can I do?" The man jumped up and he said, "The American speaks Arabic!" And he hollered his head out. He said, "Go ahead." I didn't speak Arabic, that's about the only Arabic word I knew, but it was appropriate for that [situation].

When you're going out for populations, all we did is try to inform them -- in Africa we did the same thing. In Nigeria and Ghana, they said the army's there. The general said, "Okay, they can do it, because we want to know what you're doing and why." Professor Boyer was with me, a very famous man. And we had them line them up and we talked to them and explained why and then we did it. But you can not do individual counseling, of course, in a situation like that, no.

AM: James [V.] Neel is one whom, even after he died, became part of very bitter controversy[128] over --

JB: Oh, yes. And that was very sad. He was a nice person. That was a bad rap that they had about him.

AM: One reason why I bring this up is because many critics of the Human Genome Diversity Project said it was inherently racist.

JB: Said what?

AM: The Human Genome Diversity Project to go out and try and find populations to test and be part of the Diversity Project, the entire endeavor -- Beckwith was one of these who -- and Lewontin, I think, as well, that [said] it was inherently racist, the project itself, and how it was devised, and the sampling system that was going to be used. I know you had written about it as well, that you thought the Human Genome Diversity Project was a noble and good thing to pursue, and the information that would be derived from it would be useful for all communities. How has the ability for population geneticists to do their work, in an age where we now know that there's ethical and moral implications to

[128] The Yanomami controversy involved accusations that Dr. James Neel was negligent in his treatment of members of the Amazonian Yanomami tribe when he was conducting research on the measles among them. For more about the controversy, see the website at: http://cacreview.blogspot.com/2005/04/yanomami-controversy.html.

the kinds of works that do ---- particularly in communities that do not have the same kind of standards of education and knowledge and access to knowledge.

JB: Well, everything we do can be considered racist or political. Anytime we do anything. I think it's the individual. I knew [James V.] Neel very, very well. I've been on site visits with him for his group. I would have never, never, never made that accusation, or even thought about it as far as he was concerned. But I think you're going to be accused. We're accused of being a eugenicist. Okay. So it's a bad word. But that's life. I think Jim Neel's work was very, very worthwhile that is, in South America with the Indians and other places. He was a scientist, and he may have been castigated. But that's life.

Anything that we do, people can look at it as [if] we have devious intentions. So, no, I don't think -- I suppose this could have been said of us when we were in Africa doing population studies. We were trying to talk about and look [into] adynelate kinase and do comparative studies through other populations. One of these days, the research will be found to be useful. Oftentimes, the things we do are not necessarily -- we cannot foretell the future. We cannot do that.

We went to part of Ethiopia many years ago to look at schoolchildren. The parents were told about it, but [when] we went there, the schoolchildren were out on strike and breaking windows and everything else. They were not there. And this is a Baptist missionary school. I said, "Why are they striking? What's happening?" He said, "Well, they're out there striking about something, but after all, we're teaching them the Bible, and that's important. And they're not in class learning the Bible." I said, "But do you teach anything else?" You know what this missionary said to me? He said, "No. They're poor, they're not going to do anything, and their only hope is to get to Heaven. That's all we teach them." I said, "Well, I won't have anything to do with that school."

I went to another school. It was a Norwegian school, with Norwegian whatever-you-call-them -- priests. And we walked in there and the students started asking questions. They [asked] ,“What are you doing and why are you doing it?” They talked about biology, about mathematics, and questions all over the place like that. They were doing things, doing farming and mechanical [projects] and all sorts of things. We were in that place for two days and we *never* heard the word “God”. These missionaries were doing what some say is God's will. I was so proud of them. And when you see things like that, it makes you feel good. When you go to those other missionary [schools] it makes you feel bad.

I was in Cameroon, and we have our prejudices about what is going on. I went into this village, and this kid was about twelve years of age, well dressed, sitting by himself and grimacing, just like this, with his head rolling back and forth like that. I said to my

colleague, [L.] Kaptue-Noche, "That child is still alive." I'd heard about Africans killing children like that. He said, "Of course he's alive. His family can't take care of him. This is a community responsibility." That's one of the most beautiful things I'd heard. I said, "It's a community's responsibility. Why don't we have that attitude in the United States?"

Those are the pleasures of going around studying people, but at the same time not looking down on them but trying to learn, and you learn from them. Oftentimes you come away a much better person. I asked my friend, Professor Alex Boyo in Nigeria, when we went there I asked him, "What do you think about the Peace Corps?" You know what he said to me? "It's very good for the Americans." Beautifully done. And he was right. When they [the Americans] come back, they'll be different. Well, I could go on and on and on.

AM: Two more questions and I'll finish. One goes back to the Human Genome Diversity Project and its critics. You've mentioned briefly before the increasing role of the pharmaceutical companies in using and controlling genetics, the Ortho pharmaceutical company that sold the screening kits for sickle cell anemia. Some of the critics of the HGDP said that one thing that is not guaranteed is what happens to this information, that it's taken from these communities and used for private purposes, commercial purposes. That seems to me a big change in the world in which you were doing your research and the world that is now. Have you ever considered taking out any kind of patent rights, property rights, or commercial rights over the kinds of testing that you were involved with?

JB: No, we did not. Along those lines, I thought it was absolutely terrible -- and I've forgotten the example, it was out in California someplace, where this man had a rare variation, and it was used by a pharmaceutical company, and they did not pay him. They made a fortune out of this man and his line is still there, and there are many lines that they do not -- and I think that's disgraceful. I mean, I've been in conferences about that. I said, "But this company's making millions out of this line of this person, and they should give some of that money back to him." I was greeted with a dead silence. No. I think that's wrong. I would never, never, never have done that. I think it's wrong.

AM: So what impact has it had on the field of genetics?

JB: Well, you know, it's not just the Human Genome Project. One thing that came out -- there was a discussion on the thing and this has come out on the Human Genome Project. When we said what we should do as far as genetic testing. Some have recommended that the genetic tests not be on the chart of the patient. You've heard that, I know. That it should be put aside from the chart. And I said, "That's absolutely disgraceful." Okay. As far as genetic tests, what we should do is eliminate the history and the physical examination from the chart, because more than likely we can find, at

that day and time, much more about genetics from the history and physical examination than any genetic test. So are you going to ban that from the chart?

I think oftentimes we have noble ideas and all, but sometimes they are impractical and they're impossible. I think people who said that genetic tests should not be part of the chart, they meant well, but there's some things I don't think we can ban. Or should. Because they're not practical. That doesn't make sense.

AM: One last question I want to ask. In 1977 *Journal of Pediatrics* you had written a letter to the editor criticizing the methodology, the sampling, the statistical significance of a paper that was trying to explore the effects of sickle cell trait on intellectual development.

JB: Oh yes. And I know the person who did it, yes.

AM: Your response was to just move away from these questions about genetic determinance and intelligence. One of the responses in the reply of the authors of the paper to your letter to the editor was that this is just simply an emotional response. It struck me as saying that it's very difficult to be a scientist as an activist when there's also this tradition of scientists as being dispassionate and objective. We talked a little bit about this off tape, that there is a kind of activist tradition in the sciences, but in certain times it seems to marginalize a scientist's work rather than -- You end up getting responses to your letters and your ideas as being emotional. How important is -- clearly you've been very activist in your work, particularly in the last two or three decades. How important is it that the field maintain an activist tradition in saying that there's other things besides genetics that determine --?

JB: I know that paper, and I know the person very well who wrote the article, and I talked to the person later about that article. This is about intellectual development with the sickle cell trait, and it was absolute nonsense. I mean, there was no basis whatsoever for that. Just because somebody has sickle cell trait or any other trait --. There were no studies that I saw in that paper in which they had tested persons with sickle cell trait and those who did not have sickle cell trait to compare their intellectual development. It was not done, and I haven't seen it today. It was more theoretical. Okay, fine. I felt that a person who said that, well, what is your evidence? And there was no evidence. If you're going to write a paper, supposedly a scientific paper, have some evidence.

AM: And also, part of your criticisms were that this testing was done in a vacuum, this testing was done in a particular social, cultural, political, economic context in which we cannot divorce the implications of the genetics behind the work. The author's response was, oh, this is just emotionalism, which is not addressing the point that you were making. I guess I'm interested in knowing, how do you bring your colleagues in the field

to look at the same set of scientific facts in the same way, that these just aren't bits of information that are being created, but they are also part of a much broader context?

JB: I mean, I did not say that I know why you think that. I would never say that. Personally, I believe the reasons why it was written… But also, that was a classic example that I learned at Dunbar High School, it's *argumentum ad hominem*. If you cannot answer the question, attack the person. Perfectly all right. And that was done. And that was their defense. But when people react like that, I know full well that they know better, and that was their only defense. That was an *argumentum ad hominem*. It didn't bother me.

AM: So is activism among geneticists dead, or is it --?

JB: Oh, no. I mean, I hope that human geneticists or scientists or -- we are human, and we are first of all human. I don't think geneticists should be any different from anybody else, I hope.

AM: Okay. Well, I lied, I'm going to ask one last question that I forgot to ask you. In 1990 you wrote a book with Robert [F.] Murray about -- basically a very comprehensive work on the origins of genetics in African populations. Could you just tell me a little bit about how you and Murray begin this collaboration?

JB: I knew him before when he was part of the early days of sickle hemoglobin. We oftentimes went to conferences and agreed and disagreed. I was invited by Johns Hopkins University Press, and I think you know who was behind it. I won't mention who did it -- asked would I write this book. I said, "Yes, very good." I thought of my friend Bob Murray at Howard University, who was head of the genetics program and head of our own genetics program, the human genetics program, there too. I asked him if he would like to collaborate, and he did. It was just as simple as that. I mean, he was a friend, and we knew that we agreed and disagreed. In fact, I have a paper that I gave at the [W.E.B.] Du Bois Conference [on the Study of African American Problems] on their anniversary of his death. And I couldn't give my paper there because I had had a stent [procedure] done on my coronary. I wrote the paper, and I asked Bob Murray to give the paper. But he also, at the end, which I liked, too, he had a critique of it. He said a lot of nice things about it, but he disagreed with some points, too. That's another big -- because we collaborated. If we disagreed, we'd come back to a meeting of the minds in some sort of way. It was amicable, and I knew that it could be done and knew that he was fair. So I thought what better person to collaborate with, and that's the reason why. It was straight forward.

AM: Well, I've come to the end of my questions, so I will turn it back over to you and ask you if you'd like to talk about anything that I haven't asked you.

JB: Well, I think that I have talked too much and too long and too verbose, and I think maybe we should end. I enjoyed it, very much so.

AM: We really appreciate you taking the time to have us do this interview. Thank you very much.

JB: Well, I enjoyed it.

END OF INTERVIEW