

Oral History Interview with Francine Benes, 19 January 2016

Archives for Women in Medicine, Center for the History of Medicine

JOAN ILACQUA: [00:00] Hi, this is Joan Ilacqua, archivist for women in medicine at the Center for the History of Medicine at Countway Library. Today is January 19, 2016. And I'm at McLean Hospital in Belmont, Massachusetts with Dr. Francine Benes, director emeritus of the Harvard Brain Tissue Resource Center and William P. and Henry B. Test, Professor of Psychiatric Neuroscience at Harvard Medical School. We're conducting an oral history interview for the Center for the History of Medicine. Dr. Benes, do I have your permission to record.

FRANCINE BENES: Yes you do.

ILACQUA: OK, wonderful. So as I said, my first question today is background. If you could please tell me about yourself, your early life, and what drew you to science.

BENES: Well I was born in Queens, New York. And I've been said to speak the Queen's English. I left New York. I went to high school in New York and I attended St. John's University where I got a baccalaureate degree in 1967. And from there -- I was a science major. And from there I went to Adelphi University where I matriculated for a master of science in biology. And at that point in my life I was

already very interested in the brain. There was a lot of growing interest in this area because of I think psychology and people wondering about thinking and logic and so forth. So while I was at Adelphi, I had to pick a mentor. And the biology department had one person who was doing brain related research. He happened to have his laboratories at Creedmoor State Mental Hospital where I would have to go in order to do my dissertation work. And this was really a tremendous eye opener for me. My family did not have major mental illness and so I had never actually seen a severely debilitated person with schizophrenia or any other form of psychosis. But while I was there, I did see many patients and was struck the very distinctness of their appearance and their behavior. It reminded me of sketches that I had seen by Francisco Goya when he was at a mental hospital in Spain. And it was extremely moving to me. I didn't at that point recognize that I would become interested in the study of mental illness, but certainly it was there that I was first exposed to human postmortem brain research. The research facility that I was working at was actively removing brains from patients with Huntington's chorea. And I was of course very impressed by this and intrigued with what it was about a brain that had been alive just minutes before and its ability to think now suddenly unable

to think presumably. But it didn't run very deep at that stage.

But after completing the Master of Science degree, I had been admitted to the department of anatomy at Yale Medical School where the emphasis was on cell biology. And I wanted very badly to have a dissertation project that was related to studies of the brain. And my mentor there, Russell J. Barnett who was the chairman of the department, he assigned me to a project that involved myelination of the trigeminal nerve, a peripheral nerve in rats during the post-natal period. And I worked on that for two to three years and became very impressed with how interesting post-natal development of the rat brain was. I still didn't appreciate at this stage that I would later become interested [05:00] in this area in relation to not only human disease but particularly schizophrenia.

After completing the PhD degree, my first post-doctoral fellowship was in the City of Hope Medical Center in California where a man named Richard McCammon was doing single cell neurochemical studies of individual neurons from an organism called the *Aplysia californica*. It's actually an invertebrate specie that was notable for the

gigantic neurons that one could see with appropriate microscopic optic. I was trained to dissect out individual neurons, place a single neuron into the bottom of a specialized micro test tube, and perform very specialized analyses of their neurotransmitter content. Interestingly the project that I was assigned to involved the neurotransmitter system called GABA, gamma aminobutyric acid. GABA is a transmitter that is notoriously involved in inhibitory mechanisms in the brain. So at this stage I still wasn't making a connection between this and my subsequent devotion to neurocircuitry studies, but I was gaining an increased insight into the GABA system by working on it in this particular organism.

Now if I can just jump back to Yale while I was there, it was a very unique experience because Yale Medical School was a very pioneering institution. At this stage in the 1970s going back into the late 1960s, the field of neuroscience was still very much in its infancy. In fact in the United States as I recall, there was only one institution and it was here at Harvard, the department of neurobiology, that was founded by Professor Kuffler, that was engage in multidisciplinary approaches to the study of neural tissues and mechanisms. And so I was hearing about

this, I was seeing presentations on a regular basis, but also noteworthy was the fact that the department of psychiatry at Yale also was pioneering in their interest in the neurobiologic basis of psychiatric disorders such as schizophrenia and depression. And so on a regular basis, there were seminars being presented that were addressing this problem. And some of their seminal writers in psychiatry were talking about thought disorder in schizophrenia and I started to wonder if there was any relationship to disturbances in the connectivity of the brain in patients with schizophrenia and the fact that they showed illogical thinking and a general disruption of their thought patterns. I lost my train of thought there.

So again, another issue that was taking place during this same period was the fact that I was asked to co-direct a neuroanatomy course for medical students at Yale and I co-directed this with a man named Gordon Shepherd who was already a senior figure in neuroscience at Yale. And he had undertaken another pioneering effort to integrate everything that had been learned up to that point [10:00] using a variety of anatomic, physiological, and neurochemical approaches regarding the physiology and circuitry of complex neural systems. And he published a

book while we were teaching the course that was called *The Synaptic Organization of the Brain*. And there were several medical students with PhDs who were interested in becoming translational neuroscientists who asked that they could have a special didactic session with Dr. Shepherd and learn more about what he had written in his book. And so I too was learning about this and I began to realize that the illogical thinking in schizophrenia could be explained eventually in terms of specific defects in the wiring and connectivity of circuits within the brains of patients with this disorder.

Once I had that insight, I was hooked. I just knew that's what I had to devote my career to even though there was no understanding of where I would get postmortem human brain tissue. It was not being collected at that point on a systematic basis. Nevertheless, I decided that I would have to go to medical school and become a psychiatrist so I could truly understand what schizophrenia and thought disorder were. After all, I had been a basic neuroscientist and up to that point I had been studying simple systems like frog neuromuscular junctions and the auditory system in chicks. And so there was a long leap from those kinds of systems to the human brain and

behavior. I then decided to seek out a residency. I didn't know where but I knew I would have to have access to human postmortem brains. But there were none that I had heard of informally that would have been suitable. Then one day I was walking down Cedar Street which runs right through the medical center at Yale and I ran into one of my former students who was a PhD in molecular biology. And he told me he was extremely happy because he had just been selected into the residency at McLean Hospital. And I congratulated him and I said, "Could I ask you a question?" And he said, "Certainly." I said, "What's McLean Hospital?" And he said, "You don't know about McLean Hospital?" I said, "Actually, no I don't." And he explained to me that McLean was a Harvard affiliated teaching hospital but notably he said, "You of all people should be going there for residency because you're going to need human postmortem brains for the research that you're planning to do." And he went on to explain that Edward D. Bird, a pioneer in brain banking had been recruited from Cambridge University in England where he had set up one of the first brain banks in the world to come to McLean Hospital and establish a brain bank here in the United States where they would collect brains from patients with schizophrenia, but also brains from patients with

Huntington's chorea which was actually his area of emphasis in his research.

So in 1979 after completing medical studies I moved up to the Boston area and started my residency training and was just amazed at how interesting the psychiatric disorders were, particularly schizophrenia and how much could be done to treat patients with this disorder and help them to improve their functioning. So upon completing my residency training in 1982, the hospital provided me with a small amount of space and a small amount of money consisting of a few thousand dollars to start setting up my laboratory. And Dr. Bird was very helpful in giving me [15:00] benchtop space in his laboratory and access to the equipment in his lab and most importantly to the postmortem schizophrenia cases that he had already collected so that I could start developing my research program. Can we stop here?

ILACQUA: Sure.

END OF PART 1