THE DAVID MAHONEY INSTITUTE
OF NEUROLOGICAL SCIENCES

ORAL HISTORY

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The Flexner Years (1953-1965)

Louis Flexner:

The Dean of the Medical School came to see me in 1951, and said that they were looking for a new Chairman for what was then the Department of Anatomy of this school. Essentially, he said they would like to see me come. Well, I knew Dr. Richards [sp] was a very important figure in those years here at Pennsylvania. He was an extraordinary man in all ways, and rather strikingly so in his character. I was at the Carnegie Institution of Washington's Department of Embryology at the time, which was located at the Johns Hopkins Medical School in Baltimore.

I thought I'd come up and take a look, and I had an idea that Anatomy, to make its proper contributions to the knowledge of medicine, had to continue with morphology but also needed to add neural approaches. When I communicated this to the Dean of this school, Dr. Mitchell [sp], and told him that I thought there would be those people in the environment who would not see things my way, he told me he would explore this.

Well he did, and came back with the invitation. I said that if this happened to me, I must give up my primary endeavor, my own research work -- I had to now become interested in adding to the interests of the department and make the department and its members my primary obligation. My research interests at the time were in embryology, the development therein but particularly the development of a biochemical nature primarily that went on in the central nervous system. So I came here with the hope and idea of getting several departments to collaborate in the formation of what we called an Institute of Neurological Science. And I did this because in my teaching and my thinking, the nervous system calls for a kind of combined approach.

One of the attractive things about this department, at the time that I was thinking about coming, was that the man who was leaving, who had been the Chairman, a man by the name of Dr. Wendell [sp], was a neurologist himself,

neuroanatomist, and had some excellent people here in neurology. I can name those people: Dr. Sprague and Dr. Chambers, Dr. Liu. So way back there in 1951 we got together those people in the department and talked this thing over, and Dr. Sprague knew somebody from the Pennsylvania Hospital who was interested in joining with us, a man by the name of Therman.

Well, the next job was to try to fill the gaps in our department and to bring in other departments. We filled one gap with Dr. Stellar. He had a background quite different from the rest of us. He had a psychological background, neuropsychiatry, but was an experimentalist. His coming depended on our finding grant money to pay his salary. I went around to the various departments, some were very much interested in this business, some were very naturally less than very much interested.

But then a question came up of making progress with National Institutes of Health funds. Well, at the time, if a young man wanted, let's say, to come to an institution on a fellowship, he had to have the backing of two groups: the group that he wanted to work with and also his application for a fellowship had to be approved by the National Institutes of Health. So my effort, primary effort, was to see if we could change that so the NIH would make a grant to the institution and let the institution have final say about whether the student was acceptable or not.

So I then started my innumerable trips to Bethesda, and it wasn't too long before officials in Bethesda felt exactly about this business as we did here. This only cost me a couple lunches!

They asked me to prepare a grant request, and then they did a remarkable thing. They sent one of their own members over to Philadelphia, and he spent practically a week living here with my wife and myself. He helped write up the proposal. Not with the idea of selling it to them, but for making it desirably acceptable to the civilian group that had the final say in all these things. So a man by the name of Fred Stone came over and he lived with us in our apartment and he helped in a vital way.

Well, he was tremendously taken with the way the Department of Anatomy was run. Much of that was due to my secretary at the time, Mrs. Wittingham [sp] her name was. And we really had the financial running of the department in fine shape. It's remarkable to me when I think back to what we did. For example, our halls badly needed painting but our budget didn't have any money in it. So my wife and I went around and looked at the walls of other parts of the University, and the more we looked the more certain we became that our walls had to be fixed, so we just paid for it! No kidding, that's the way it was then. But that's a little bit off track.

Mrs. Wittingham [sp], as I say, impressed Fred Stone so much that when they became short of help up there to take care of the expense accounts the civilians working in their

projects would present, this department became a second part of the financial structure of the National Institutes of Health. I'm not kidding you. And I went down to the Philadelphia National Bank and told them what the situation was and I said, "Listen, I don't want to open myself to any possibility of trouble, so I don't want any interest on that money." Well, they had ever heard of such a thing! I don't know how many years we carried this thing on but we had a bank account with hundreds of thousands of dollars, just imagine that. It occurred to me as I got older to change my citizenship and go live in Spain or some place , but I didn't bend!

Now then, we had to make up a budget for ourselves, and that budget had to contain enough funds to bring Dr. Stellar here and to satisfy the needs around the departments. We asked for $25,000, and believe it or not, we got it. That $25,000 in those days was worth something, and we brought Dr. Stellar here.

Stellar, I think last year, recalled the following: He said that when I hired him I promised him an annual salary of $7,200, and his first check told him he wasn't going to get $7,200. He was only going to get $7,000. He came to me and bawled the hell out of me, so we raised it back to $7,200! I'm telling you, it was some day.

Now then, what that $25,000 took care of, when I think back on it, was remarkable. We have a good friend who now is at the University of Texas. At the time he was in Czechoslovakia and he wanted to come to this country and work with a man in physiology by the name of McCann. Well, he couldn't pay for his trip so the Institute paid for his trip, you see. That sort of thing. And he's been our loyal friend up to the present.

It's just amazing what in those days we did, you know, that was really good stuff. It wasn't long before I was asked to chair a meeting over in Bethesda to which all schools that might be interested in an institute, or something of this kind, in neurology would send their representatives. Well, you never saw such a turn-out! Obviously, one committee couldn't do all the work with this many people involved, so they split them up by disciplines, so there would be one for Anatomy and one for Physiology and so on, you see. Those were really very interesting days, and I think it helped shape the field for the neurosciences.

James Sprague:

I had recently come here from Hopkins Medical School. I came in 1950. Dr. Louis Flexner, in 1951, became Chairman of this Department. With considerable prescience, he formulated this concept of how he would see certain fields of anatomy and embryology develop in this country. He chose three fields: he chose cell development, he chose

neuroscience in a rather broad way, and he chose what might best be called molecular biology. He attempted to build up the faculty of the department emphasizing those three fields.

In view of what has happened since '53, now 40 years, he was pretty much on target.

In order to facilitate, to stimulate, catalyze this development, he had the idea that what we might try to do was to build within the Department and the Medical School and the University, an Institute of Neurological Sciences.

The initial concept of that was to facilitate interdisciplinary growth. I think we all felt this was really the future. No longer would it be limited to neurophysiology, neuroanatomy, neurochemistry as separate subdivisions. We felt that the main developments and breakthroughs were going to come in the intervening cross-fertilization of these different disciplines.

The Institute was to do that in several ways. It was to do that by bringing in new faculty members, not only to the Medical School but to the University as a whole, in the neurosciences. And it would do that by training pre- and post-doctoral fellows in the neurosciences. If you established a multi-disciplinary faculty, it would by necessity result in that type of training for the people who came here.

The effect slowly got off the ground and once it did, it went rather rapidly. The nucleus remained here in the Medical School and the original group of people were six. No, actually five: Flexner, William Chambers, John Brobeck, who was chair of physiology, myself -- so there were three of us in anatomy, one in physiology -- and the fifth person was a physiologist who had considerable psychiatric experience. His name was P. O. Therman. The idea of bringing him in was the notion that the basic neurosciences could influence psychiatry in an important way, getting it away from pure analysis and psychotherapy, but it would give psychiatrists a much better biological basis. I would say that was reasonably successful too, although it took a while.

The sixth person came a year later: Eliot Stellar, who was a physiological psychologist from Hopkins. We felt it essential that we have that type of expertise in the behavioral sciences.

I was trained in biology at Harvard and later in anatomy at Hopkins and I became very interested in behavior after moving here. Therman was trained in psychiatry and neurophysiology. Brobeck was a neurophysiologist. Flexner was largely a neurochemist and Chambers was trained in anatomy, also behavior.

We had a small nucleus there and we attempted to build this up in the Medical School and we did that rather successfully in several different departments. We attempted to build it up in the Department of Biology, which we did, and the Department of Psychology by getting more faculty

people here. Once you get young or tenured faculty, you are going to attract students at the same time and the whole thing will expand. In fact, it did very much so.

Louis Flexner:

My main goal always has been to leave people alone and let them follow whatever it may be. And ~~you~~ support them, if they need support, to the best of ~~your~~ my ability. There wasn't anything original about that.

I think it goes back to my very earliest days as a young boy, way back when I went to Sunday School. I've never forgotten that "pride goes before destruction, and a hardy spirit before a fall." And then this: I must have been three or four or five years old, sitting on the doorstep of the home of an uncle of mine, when on the opposite side of the street a nurse went by with a boy who was crippled. I laughed at the way the boy walked, and my cousin, who was older, explained to me that this boy wasn't to be laughed at. You don't laugh at something like that, he said, you take care of it in a much different way. That was a great lesson to me.

I had gone to Johns Hopkins Medical School to get an M.D. degree and I had worked in their Department of Anatomy after my graduation for a decade. You couldn't work at that place in those days with anything but gratitude for the way things went. I graduated last in my class. The man who graduated next to last in my class is a man by the name of Keffer Hartline. He subsequently won the Nobel Prize. Now, when he won the Nobel Prize, I sent him a telegram the contents of which were as follows: "If the next to the last man in the class wins the Nobel Prize, what's expected of the last man?" He got sore as hell! He said, "You weren't last. I was last!"

The classes were conducted in a way where the primary effort was not just to give the student a lot of information, but to get the student to assist in a situation where he would feel the responsibility for doing things for himself. That is such wisdom in my opinion. Then, as a student, the danger was you'd get so interested in the puzzles that research efforts on the part of some people like Keffer Hartline and myself would become the most important thing to you that you could think of.

So I was working in several laboratories, but the head of the laboratory in which I spent most of my time said to me, "Listen, we're glad to have you work here, but we're so busy in the day time that the only time you can work is after we're out of the laboratory." After five o'clock. Well that meant you got to bed -- you didn't know when. And the next day you just didn't go to many classes!

I started to work on the brain when I was in Baltimore, and I think the thing that led to that was that the

Department of Embryology of the Carnegie Institution of Washington was right across from the Department of Anatomy. You crossed a little alley and you would go from one place to another. I never had a course in embryology, but I had a book by an Englishman by the name of Joseph Needham [sp] entitled Chemical Embryology that I found very attractive. And I think it had a lot to do with my entering into that field. And I'm still in it.

James Sprague:

The idea when we started the Institute was to keep it as a separate entity. It was not to threaten the vitality of the individual departments, but to enhance it. In other words, we thought that the attractiveness of this kind of a nucleus would bring people, good people, into other Departments of Pharmacology, Physiology, Microbiology, Biochemistry -- and it did all of that.

We obtained from NIH, National Institutes of Health, the first training grant that it awarded of this nature. This was to pay the stipends and tuition of graduate students and the stipends for post-doctoral fellows. The stipends were quite low at that time. Money went a long way. The NIH grant was $25,000 a year, I think, which today would be peanuts. Over the years it expanded a lot, and went into many hundreds of thousands as time went on, and that training program persisted over a long period of time. It was done through training grants to individual departments and big training grants to the Institute itself.

The second group that developed in neurosciences was the one at UCLA very soon thereafter, and was focused around the person of Horace Magoon [sp].

We proceeded in that fashion, in a fairly low-key way, and it was enormously attractive to people. We had a very good esprit de corps. People were very much involved with this notion. The Medical School, the Dean at that time was John Mitchell, and the graduate school of the University, his name was Nichols [?], were very supportive of this notion.

Eventually, in order to provide students and faculty with certain very important aspects of facilities, we applied for and got money to found several different shops - machine shop, electronic shop, and an art and photography shop. They were widely used. We had enough money so that we were able to offer to the members of the Institute, and the students who were working with them, these services free. They would build special equipment, they would do the illustrations and photography for papers, and they would build and repair electronic equipment which was widely used then. That aspect came into the picture about five years after the founding.

1953 is when we started, and we brought Eliot Stellar here in '54 and he became the sixth member of the Institute. We started off with six members and a number of other people as associate members, let's say 15 or something of that sort. They were in the departments of neurology, neurosurgery, psychology, biology, physiology, psychiatry - that kind of thing. After a length of time we extended the membership considerably.

The important thing was that this was a venture that came just at the right time. It was soon after the end of the war, NIH had a lot of money and was very interested in building up this kind of atmosphere. We obtained everything we asked for and we got money from private foundations also. We got a large grant of money from the Ford Foundation to foster this idea of training, giving psychiatrists a better biological background.

About this time, for example, in physiology there was electronic equipment and various methods of amplification and the cathode ray oscilloscopes - all of that developed so that physiologists were able now to record in a much more sophisticated way activity within the brain and within peripheral nerves. Very fine electrodes were developed that could be placed into the cortex or into the mid-brain or wherever and actually record in a remarkably wonderful way.

It is important in a thing like that, that you just don't record in a certain part of the brain and come up with beautiful electric records, but you know where you are. So, neuroanatomy developed along with this. For example, up to that time in anatomy, one of the techniques that was used to trace pathways from A to B was a marquee method in which the myelin sheaths broke down after lesions, and could be tracked out because of the changes in the chemistry of the material. Shortly thereafter came some new techniques of staining the axon itself and its breakdown so that the ability to trace these innumerable pathways developed amazingly quickly. People began to put the two together, and not only that, about that time there were remarkable developments from the pharmacologists of the capacity to identify transmitters and various chemicals within the brain that had to do with the neural activity. They also tracked that out anatomically, and they developed it neurochemically. So neurochemistry, pharmacology, anatomy, physiology, soon, you see, began overlapping in an amazing way and people looked at all aspects of it.

You could see how much more interesting that would be to the young people, very stimulating, but the results were remarkable in scope and depth. There was just a whole series of breakthrough research in all of those fields.

Now, into this also came the behavioral. For example, psychologists, up to fairly recently, certainly up to that point and even beyond, did their work with the idea that the brain was a block box. They weren't concerned with what was inside and they wanted to know the input and the output, which could be measured by quantitating the stimuli and

measuring certain behaviors in the animal. What was within remained an enigma, but that didn't stay for very long. Because of all of these developments it became necessary for them to learn neuroanatomy, and they came over here in droves to take our course, to learn neuroanatomy, to learn the structures, find out what parts of the brain were involved in these behaviors.

That quickly developed. For example, fairly recently there has been an appointment in Psychology of a man named David Sparks who is a pure neurophysiologist, he's in the department, and people are very interested in what he finds. You could see what I am talking about - how these things developed, leapfrogged sometimes, developed exponentially.

The Institute remained an important focus of this because it was extra-departmental, not competing with them for funds from the University or elsewhere, and it was furnishing for them things that the department couldn't have: these various shops and facilities, and the training grants, the money to train their students. So they were delighted to put up candidates for training, some in physiological psychology or in neurochemistry.

The environment here was very receptive. Not only here but in other places. We just happened to be the first one. In that sense, we gained a lot of prestige and notoriety for that reason. It was really UCLA on the West Coast and Penn on the East Coast.

The University went along in a passive way. It didn't put up any obstacles and it helped somewhat. Really all we asked for was not to interfere. There was a chairman at the time in the early years, in psychology, who wasn't at all interested in this. Fortunately, he retired and a number of us were very influential in getting the right person over there who gave it the push. That worked in a number of places.

Well, today the interest in the brain is just fantastic. One must give Dr. Flexner much credit in his prescience, his foresight as to how things were going to develop. He had come here from a division of the Carnegie Institution in Washington, Department of Embryology, and he had been associated with the Department of Anatomy at Hopkins, Anatomy and Physiology, which both had a number of neuroscientists in them, so he was ready for that.

Louis Flexner:

Regarding starting the Institute, I have a feeling of real discomfort when I feel that I'm tooting my horn or doing something remarkable. I don't like that stuff. It's not for me. I don't like it. I think it's fair to say, though, that while other people in the United States were doing experimental work in embryology and the chemistry of the central nervous system of the brain, we were among the

first to really take it into the laboratory. That led to some tremendously interesting things, and it turned out, let's say, very well. I don't have any special feeling about being Director. That doesn't enter my head. Honestly. If you ask me have you enjoyed your time around here, I'd say yes, but whether I'm the Director or somebody else is the Director, doesn't make any difference. It was an idea that, I think I can properly claim, came out of my head, and it's an experiment that's gone well. Well, what the hell, it's not remarkable. Lots of experiments go well.

The Stellar Years (1965-1973)

Eliot Stellar:

When Flexner found some of the duties of Director too burdensome, he asked me to be the Associate Director and do things like correspond with prospective graduate students and postdoctoral fellows and other nitty-gritty things. He was clearly the leader, he was the principal investigator of the initial Institute grant. He was the Chairman of the Department. He was a Professor and the rest of us were younger. It was all quite natural. But then when he got to, I think it was age 65, he decided to step down as Chairman and to step down as Director of the Institute. The decision was made, primarily by him but also by consensus of other people in the Institute, that since I was interested in many of the issues of the Institute by then, that I would be the likely next Director.

I became Director in 1965, until '73. Going back to the very first day when I joined the Institute, the philosophy of the Institute -- and of particularly Dr. Flexner and Dr. Chambers and Dr. Sprague with whom I worked most closely -- the philosophy of science and education was very much my own philosophy. It was like a hand fitting in a glove. I had come from a place, a very good place, Hopkins, where there were different philosophies and there were battles about how you treated students, the emphasis you put on science, whether notoriety was more important than progress, and so on. But here there was a marvelous philosophy which extends to this day.

There are criteria that were evident when I joined the Institute, that drew me to it, and that I very happily enforced and carried out when I was Director. First, a very high standard of excellence. What you do, you do in a high quality way with great integrity and with a high level of achievement. All of us thought we were shooting the moon, which was an unrealistic phrase in those days!

The second was to be nurturing and supportive -- of graduate students, of younger faculty, of peers in the faculty -- rather than competitive in some cut-throat way. Everybody helped everybody else.

A third philosophy underlying the Institute, which is also my philosophy, was the interdisciplinary nature of our effort and of our organization and of neuroscience itself. Anatomy, pharmacology, physiology, psychology were all important, let alone the clinical disciplines of psychiatry, neurology and neurosurgery to say the least, and including ophthalmology and otolaryngology. That was the basic philosophy. We kept it simple. There was no pretense. The

fundamental value was to do excellent research, not to become popular or notorious.

The roots of that go back to the fundamental values of Johns Hopkins, which was founded in the latter part of the past century. That was a new kind of institution on the American scene. We heard about values, humility, excellence, high achievement. Shoot for the moon. The highest goals were embodied by Daniel Coit Gillman [sp], the president, by Rausch [sp], the first dean of the Medical School, and the Famous Four, the four great professors who started the Medical School. They all embodied these values, and it was a whole new philosophy.

Some of it was borrowed from Germany with the emphasis on excellence in science and the important role of the professor, as a leader, an intellectual leader in his community. The professor was a highly regarded, highly respected person. And he had to live up to it. Hopkins had people who were stars in this respect.

Now, Flexner's uncle, Abraham Flexner, was asked by the Carnegie Foundation to find out what was wrong with American Medical Schools. He already knew what was going on at Hopkins. And he, in a sense, went out and said that what was wrong with American medical schools was that they were not like Hopkins. Their teaching philosophy was to teach by rote, by memorization, whereas at Hopkins the excitement of discovery, research, the cutting edge of research, was being taught and the students were inspired. He wrote that famous report in 1910, the Flexner Report, which changed the face of American medicine. It essentially said that medical schools should be part of the University, that they should be academic and not just trade schools, that the motive should not be profit but the motive should be the advancement of knowledge and the transmission of that knowledge to students.

That was Abraham Flexner, and Louis is his nephew. Abraham later went on to be the founding Director of the Institute for Advanced Studies in Princeton. And Dr. Flexner had another uncle, a bacteriologist here at Penn, who was also a superstar, a humble man. He went on to be the founding director of the Bucknell [?] Institute which later became Rockefeller University [?].

And that tradition Louis Flexner carried with him, no question about it. He had the opportunity to found an institute at a time when neuroscience was just beginning to blossom. He was very fortunate in doing that, very wise in doing it, in putting that emphasis forward. He founded the Institute because he wanted to help his young faculty -- Sprague, Chambers, Liu -- by giving them graduate students, by giving them post-docs, by giving them new colleagues, by letting them practice their interdisciplinary approach. Sprague came from Hopkins, so that was easy. I came from Hopkins, so that was easy. Chambers and Liu had this philosophy, I'm not sure I know where they got it, they were born with it and were practicing it.

So it was just natural that that philosophy and those goals at Hopkins would translate here and be put into new expression. I don't mean that we simply copied them, we didn't. One of the interesting ironies, on the side, is that back in the early '50s, late '40s, at Hopkins, we tried to form an Institute of Neurological Sciences and we were told in no uncertain terms by the Department Chairman that institutes were bad news. That they interfered with the proper running of the departments, that they took away resources from the departments, and we were better off without them. As a result, there was a big exodus from Hopkins. People went like seeds to Wisconsin, to Penn, University of Florida, Gainesville, and to other places and founded their own institutes in more fertile fields. Penn was the most fertile field, and in many ways Flexner was the most powerful influence. He got the first grant for neurosciences, the first training grant, which, if I remember correctly, provided for six pre-doctoral fellows and six post-doctoral fellows plus my salary.

And that was the tradition that just fit my values, as I said, like a hand going into a glove. These were the values I learned at Brown University in graduate school under Walter Hunter, who was one of the great men in psychology at that time, experimental psychology. They were very different from the values, which I didn't really recognize as an undergraduate, at Harvard where competition meant standing on other people's shoulders or their faces as the case may be, to reach out for public acclaim. Recognition was so clear. Hopkins, in its latter days, was beginning to show this kind of competition, particularly in the psychology department, which is where I was.

So coming here was like coming home. It was something that I recognized the day that I arrived here for my first seminar, six months before I took up my position. It was one of those wonderful marriages that just was made in heaven, and continues to be in heaven all these forty years. It was very easy for me as Director of the Institute to be nurturative, to support other people, to help other departments, to give more than we took, to hold those high standards of excellence, to be interdisciplinary and to try to lead others who were new to the scene -- new faculty, new students, new fellows -- in these values. People just soaked it up. We attracted people of the right minds, and people who came here with a somewhat different mind quickly saw the values of the philosophy and adopted it.

During my Directorship, a very strange and wonderful thing happened that I can only look back at with envy. The people at the National Institute of Mental Health asked me to come down. I had a $50,000-a-year grant, it was one of their relatively rare seven-year grants, and they said they wanted to establish centers of excellence in neuroscience. What would I need? The more we talked the more I thought, "well, we need seed money for research, set-up money for a new faculty, it would be nice to have a visiting

professorship, and we could use more fellowship money." We were operating certain facilities that were crucial to the work, like a machine shop, an electronics shop and photography, but we were doing it on a shoe string. We needed money to support that. When I left the meeting, they added $200,000 to my grant for the Institute to do these things!

So we began offering free machine shop service and electronics service to members of the Institute, and people were eager to be part of the Institute and to take advantage of this. When new faculty came, we bought equipment. At that time there wasn't a real system for set-up money for new faculty. We didn't care whether they came to the Biology Department, the Psychology Department, or the Anatomy Department, we helped them. And that was the philosophy.

But we also stressed excellence. We had a terrible fight with the Psychology Department. I was made a courtesy member of the Psychology Department and they were searching for a new Chairman. The Psychology Department in those days was very weak, very poor, old fashioned, a few good faculty but mostly old-fashioned faculty. I used to go to the meetings and urge them to look for a modern, biologically oriented psychologist. Well, we had a lot of battles, including their kicking me out of the meeting. They told me that I shouldn't come to any more meetings because I wasn't on their salary. But we kept an eye on the situation, and worked with several faculty in Psychology who were very good and like-minded, and we succeeded in bringing in a new chairman named Robert Rausch [sp] who just turned Psychology around. Over night, within three years, he changed it from one of the poorest departments in the country to one of the best, recognized as one of the first five in the country. And he did it partly by making all of us over here in the Institute, who had a behavioral interest, secondary appointments in his department. We began to train students -- we had many a psychology student who did his Ph.D. with us -- and there was collaboration between faculty.

The same thing happened all over again in Psychiatry. The distinguished old Chairman who was psychoanalytically oriented was retiring and he wanted somebody just like himself to take over. I had ideas about who those people might be. We already had contact with A.J. Stunkard, Mickey Stunkard [sp], who was already here as a young member of the Department. We found him to be very eclectic, biologically oriented, and we got behind his candidacy and he became Chairman. We would help the department in recruiting faculty and attracting students as we did in Psychology, and Psychiatry blossomed.

So we were in the helping business, and by helping others we were helping ourselves.

The early emphasis of the Institute was what we called systems and behavioral neurobiology. We had some contact with clinical neurobiology, chiefly through Stunkard. He

and I collaborated for many years in the study of appetite and obesity. And there was no such thing as molecular biology in those days. There was a lot of emphasis, for example in the physiology department, which John Brobeck headed. He was one of the first members of the Institute, one of the founding members, in regulatory systems, another form of systems biology -- what was cardiovascular regulation or temperature regulation or energy balance. Those were very popular fields. Neurobiology at that time was tackling global problems, but it was reductionistic in the sense that it tried to go from behavioral to the underlying system, whether it was a hypothalamic system or the visual system. We tried to get down to the cellular level with neurophysiology, recording from single neurons. But as I say, the cellular and sub-cellular level were just barely on the horizon. But part of the philosophy of the Institute is being open to all of the new advances in the field, and we've shifted and changed emphasis. Now, I think it's fair to say, we have four emphases: cellular molecular neurobiology, system neurobiology, behavioral neurobiology, and clinical neurobiology.

All of those things were together then, and we exchanged views about them. We crossed boundaries and we collaborated across discipline, borrowed from each other, supported each other. At the time the Institute was founded, neuroscience was never recognized as a separate discipline.

Alan Rosenquist:

The establishment of the Institute of Neurological Sciences in 1953 preceded, by something like 17 years, the organization of the Society for Neuroscience. In the '50s and '60s, across the United States, if you were interested in brain and behavior, the term neuroscience didn't exist. What existed was physiological psychology, or just plain psychology. Terms like neuroscience, psychobiology, neuropsychology, they just didn't exist and if you wanted a Ph.D. in this area, you had to get a Ph.D. in a department of psychology or some place else. It goes to show, the book I used when I was an undergraduate was Morgan & Stellar, which was the first physiological psychology text book. It was written by Eliot Stellar and I used the 1953 edition when I was in college in 1962 and took the course. The book completely changed my life and made me want to go into this field.

Imagine, in 1953 there is an Institute of Neurological Sciences established at Penn, and in the rest of the world the term didn't exist. I gave papers at the 1970 meeting of the American Association of Anatomists, and in one room I was talking about the anatomy of the brain and the visual system, and next door there was some session on the pancreas

or something. In other words, neuroscience, as a concept, didn't exist.

So, around 1970 Ed Everetts [sp] at Hopkins decided they would start an organization called the Society for Neuroscience, and that represented the coalescence of all of these people into a discipline that came with its own identity. Penn was way ahead of the game, because we'd already had this for 17 years.

Eliot Stellar:

When the Institute was founded, neuroscience was part of neurology. Rarely part of psychiatry. There was such a thing as neuroanatomy, and that dated way back. People simply studied the structure of the nervous system without particular emphasis on its function. That was the great thing about Sprague and Chambers, their emphasis on functional neuroanatomy. They were great anatomists, but they also wanted to know what the functions were physiologically and behaviorally. But it was not recognized as a separate field.

In my field, there was a thing called physiological psychology. Today that's behavioral neuroscience, to illustrate how the terminology and the recognition comes about. And this was not different from the development of such fields as biochemistry, biophysics and neuroscience. They all had similar patterns. They drew from many fields and when they got far enough along, they were recognized as separate entities.

When we got far enough along we decided finally we needed a Ph.D. program in neuroscience. That became more important than worrying about whether we were helping or competing with other departments. We would try to do this in a considerate way. The Anatomy Ph.D. program was phased out because the best graduate students that Anatomy had were the neuroanatomy graduate students or the neurobiology students, and now they wanted to get the Ph.D. in neuroscience.

But in characteristic fashion, this department, quite apart from the Institute, made the decision to go in its own direction and developed a cell biology graduate program. Not long after that the idea came about that Penn ought to have a separate basic science department of neuroscience. Again, that decimated the Department of Anatomy. Worse, it almost cut it in half. At that point, having already been partly understaffed, the faculty decided that the remainder of the department should not just be a remainder but should be an exciting new adventure of cell and developmental biology. We changed our name. And now we're charging forward, having a wonderful time. I'm in the anomalous position of being a neurobiologist who happens also to be emeritus who's the Chairman of the Cell and Developmental

Biology Department and that's not my field. But it's going very well and we're recruiting a new Chairman and Bob Barchi's helping us. All the values that I've described for the Institute are also prevalent in this Department.

Now, another excellent thing that we did in the Institute was to go forward with a special undergraduate major called the Biological Basis of Behavior. One of our members who was in the Psychology Department, Norman Adler, was finding students who wanted independent majors across biology and psychology, or anthropology and psychology. There were so many of them that he couldn't really handle them, and didn't want to handle them on an individual basis. He made the petition to have an independent major quite apart from any department or any recognized discipline. I was Provost at the time at the University, and when Norm told me what his ideas were I thought they were super, and we established the Biological Basis of Behavior major.

It turns out that it grew like topsy -- again, because neuroscience was becoming so exciting. Students in the College, and some in Engineering and in Wharton and in Nursing, were very interested in this and signed up for it. It became one of the top three largest and most demanding majors here, sending the largest percentage of its majors onto graduate professional school, medicine and veterinary medicine. It was really built on the spirit of the Institute, and one can view this as a product of the Institute even though it resides not in the Medical School but in the College. It was, from the beginning, interdisciplinary. People who taught it were members of the Institute and they came from veterinary medicine, from basic sciences in the Medical School, and clinical sciences in the Medical School. And over half the teachers worked outside the College, and the students began signing up for research and independent studies with faculty in the Medical School, with members of the Institute and so on. This developed to a very high point. In fact, we nominated this educational innovation, if you will, for one of the Dana Foundation Awards and Norman Adler won it. They got $50,000. And this facilitated the export of this idea to other colleges and universities, which were already beginning to pick up on it.

So the Institute made another important contribution. It had two educational spheres, the Ph.D. program and the Biological Basis of Behavior, even though, if you look at it administratively, the Biological Basis of Behavior is an independent entity. Although it's not recognized as something coming out of the Institute per se, it was obvious that it grew out of the Institute. The current Director of it, Ed Pugh, is an Associate Director of the Institute, and that obviously ties them together.

The fact of the matter is, modern students don't want a Ph.D. in Anatomy. They want a Ph.D. in Neuroscience, Molecular Biology, Genetics, Cell Biology. So we have to restructure ourselves to let them know where to find their places. All of this is part of the nurturing,

All of this is part of the nurturing

interdisciplinary philosophy of the Institute. We like to think of the Institute as being woven into the fabric of the University, adding great strength. That's proven to be one of the greatest sources of strength the Institute has. In atmospheres where there is fear and competition and where the departments don't want to be threatened, or think they're going to be threatened, this can't happen. They're falling behind, though some of them are recouping. Hopkins now has something called the Mind/Brain Institute that's opening, and this is 40 years later, in this interdisciplinary spirit.

The Institute at Penn started with six members and we very quickly drew up a list of probably a dozen associate members. Very quickly the active ones of those became members because they were indistinguishable from members. I would say that by the time I became Director, the number was probably up to around 15, maybe 20 members, and about an equal number of associate members. That process continued with the expansion of the University during this period and with the expansion of the neurosciences field. Everybody wanted the neurosciences, whether it was psychology, biology or pharmacology. More and more people came along and wanted to be part of the Institute, and we felt that we should take in any qualified faculty member who wanted to be active in the Institute. And that growth process continued. Our membership criteria were: first, excellence in the field -- and that was recognized by having a proper appointment in a department of the University -- and secondly, a desire to help new faculty, or faculty entering the field, achieve their goals. That combination was a very positive one.

What we did at that time, because we had money, was to offer set-up money, offer partial salary, sometimes salary for the first year or two. We still had trouble. For example, we desperately wanted to hire a molecular physiologist. Physiology wasn't putting that high on its list. That would be the logical place for a molecular physiologist to be. They wanted to be in Physiology and we searched and failed. It was a tough row to hoe. Then along came Sol Arucar, and he had also come from Hopkins. His view was that he'd like to join this bunch, he didn't care whether he was in Physiology or not. And at that time we were able to convince Pharmacology that he'd be a fine addition to their faculty. And it worked. But it didn't always work. Similarly in recruitment of faculty to Biology, there were three or four faculty there who we helped with set-up money and offering colleague-ship so they just weren't plunked down in a department without neuroscientists around. And the same thing in Psychiatry and Psychology. So we did it by persuasion, by attraction, by offering interdisciplinary training, by offering a graduate fellowship system, by offering access to shops, facilities and by offering colleague-ship for science. And a happy atmosphere. And it worked. But it was hard. It was probably one of the hardest things to do when I was

Director. And then there were some cases where we failed, where we lost the person we wanted because we couldn't make a fit. Well, that reached a peak just recently when we decided the only way to truly solve that problem was to have a Department of Neuroscience that could hire these people, and that's what we did. We solved the problem that way in 1992 when the Department became official. It staked out a certain area of need in molecular biology and systems biology, and neurobiology, which it made its main emphasis. And it's worked very well.

I had a wonderful time being Director. It was relatively easy to do because it was what I loved to do anyhow. And it was wonderful to see the field grow and expand. I had written, co-authored, a text book in physiological psychology back in 1950, which was interdisciplinary. It borrowed heavily from physiology and anatomy as well as psychology to address the major questions in the field about memory, learning, perception, motivation. It was reductionistic because it wanted to know what the basic hormonal and biological bases of these behaviors were. Being able to be Director of an Institute with people with expertise in all of these fields and watching it grow was to see the text book come alive. That was very exciting.

Well, things change, and I left the directorship and became Provost of the University. Jim Sprague took over, and carried on very much, and very ably, in this vein. The financial picture began to change. NIH and IMH were getting tighter and tighter on funds. This wonderful grant that we had was running out of time, and it was clear they weren't going to renew it. So we had to begin to charge for the shops, for example. We had to apply for new training grants because the umbrella grant didn't provide enough fellowships. We did all of those things. That was beginning to happen while I was still Director, but a lot of that fell on Jim Sprague. I tried to be supportive of the Institute as Provost. I made the decision that it was one of the best things that the University had, and that I was going to put resources into it, and I did.

The Sprague Years (1973-1980)

James Sprague:

What Stellar and I did, sequentially, was to increase the scope of the Institute and increase the amount of its funding. We had a large amount of funding, generally for program project, for research, a separate pre-doctoral training grant and a separate post-doctoral training grant, both of them quite large. We had three grants from the NIH: program project for research to be utilized at the discretion of the director, and two training grants. And the program project sufficed to fund the shops that we had. We tried to make those services as nearly free as we could.

If I remember correctly, when I was Director from 1973 to 1980, we had somewhere between 85 and 90 members of the Institute. Those were faculty in a variety of basic and clinical departments. From a beginning of six to 85, there's a big increment there.

Now, I became Chairman of this Department in 1967 to 1976, and for three years there I was Chairman of the Department and Director of the Institute, and during that time I made an effort to build up one sector of neuroscience, which was the one in which I did research -- the visual system. And I appointed four members of this department who were working on the visual system and we branched out a little bit, under the umbrella of the Institute, to support visual sciences because there was a new institute in NIH ready and willing and anxious to support these ventures.

We got two different grants in vision. One was a Visual Center grant to buy expensive equipment that could be used by all members, instead of duplicating it in each lab, and to support those doing research on the visual system with access to these various shops. Paul Liebman [sp], who was a member of the Institute, became Director of the Visual Center, supported by NIH, and he still is and it still is supported by them.

We applied for a special training grant also from NIH for training students in visual sciences and ophthalmology, with a very strong clinical relationship with the Scheie Eye Institute and the department of ophthalmology. Leo Hurvich became the head director of the training grant. He has since retired and Peter Sterling in this department is the new head of that training grant.

One of the things that I did in the neurosciences, apart from my own research, was to bring in more people working on vision and to establish a training grant with a strong clinical side to it, and a center grant also serving the clinical people as well as basic science. We have

always been very interested in the Medical School, in bringing the two things together as much as possible.

And we have made another step there in the teaching of the course in neurosciences to the medical students and that course is taught by Anatomy, Physiology, Neurology, Psychiatry and Neurosurgery. The center and dynamism of that had to stay in the basic sciences because clinical people are too busy. They could come and give lectures and take isolated spots in there but they can't run a course like that. That has been a very successful course -- neurobiology. That course continues to this day. Alan Rosenquist was, last year, the head of the course.

I think roughly there have been 12 members of the Institute that have been elected to the National Academy of Sciences, which is some indication of the way the members have contributed to neuroscience. There have been a lot of other medals and awards that I don't have at my fingertips.

Sprague

The thing that's sort of an intangible, and it's hard to express in a dialogue like this, is the really wonderful spirit that has gone on for years. There has been a tremendous amount not only of professional stimulation, but of personal relationship, and a thing like this doesn't succeed well if it doesn't have that.

I think possibly Penn has a rather remarkable kind of looseness to it that engenders that. We have had very little internecine warfare among the departments and I have seen a lot of that in other places. Harvard, for example, put together, they didn't call it an Institute but a Department of Neuroscience, and its head was a man named Stephen Cooper [sp]. In addition to several members of the National Academy, they had two Nobel prize-winners. But when Steve Cooper died, the thing just went to pieces. There wasn't the momentum and impetus that has been present here right along. It didn't hurt anything when Eliot Stellar became Provost of the university. He saw to it that the President understood something about neuroscience, which he probably wouldn't have otherwise. It has just been a very felicitous environment.

More students and postdoctorals tell me that they have gone on to other jobs elsewhere but they never had an experience such as they had here. They certainly didn't have it at the place they went to. Of course, partly that was due to the fact that it was the time of their lives when they were young and ambitious, idealistic and all; those things contributed. But one of the things was a fairly loose atmosphere and that is what we tried to keep - a minimum number of restrictions, a minimum number of stiff, inflexible requirements, very few. We tried to tailor the training and the requirements to the needs of the students so that they could develop themselves. Because the important thing is not to hold a man against the wall and pound his head until he learns things - it is to get him to think and get him to develop himself. That's really it. I think the atmosphere had that kind of nurturing. People

were there to help and they didn't intrude overly. There was very little of this business of organizing a team of graduate students to do all your research for you. To try to get the student to write his own papers and to think how to do it himself - that was the important thing.

I spent a lot of time in various other places, for example, the Rockefeller. The atmosphere is totally different there. The head of the department is a virtual dictator. By God, you do what you are told to do and the way he wants it or you don't stay there. They even go to lunch together, sit at a table, and they don't talk to the guy at the next table. Incredible. Little fiefdoms. We tried to break all that down here, and were pretty successful.

One of our members from psychology, Dr. Norman Adler, put together an undergraduate university program on the Biological Basis of Behavior which was strong in neuroscience, and that rapidly became the most popular undergraduate major in the university. That's another thing that came out of the influence of the Institute. It really started with undergraduate training and went up to graduate school on one side, and post-doctoral, and into the Medical School on the other. Very widespread. And it was all built around the brain because it's such a big part of the body.

In time there was a need for changes. For one thing, we were losing some of the best applicants for graduate school who no longer wanted a Ph.D. in Anatomy, Physiology or Biochemistry - they wanted a Ph.D. in Neuroscience. It was very important to establish a separate specialization, which had not been true earlier. That started to become an important thing just at the end of my role as dictator and during the time when Saunders and Rosenquist were acting directors. They shepherded things along until Barchi was appointed. Then it became really important to do that.

And in the same sense, it has become important to found a Department of Neuroscience and to give it a role, an active, specific role, in teaching. This inter-disciplinary course I was talking about is now being taught by the Department of Neuroscience. It needed more formalization than it got. I think we did it the right way to begin with, which was also the way Magoon [sp] did it at UCLA and several other people. But as it went along, these other things became obvious and it needed to change.

I enjoyed the experience as Director a lot. I like to do things in that sense in a rather informal way and we ran it fairly informally. I asked half-a-dozen people to act as an executive committee and we would meet at least once a month and go over the situation, funding, training and other things like that. That was very pleasant for me. I think it was for everybody. We had a feeling at the time that we were blazing these new trails, shaping and defining the field.

In time I just felt I'd had enough administration. I was tired of it and I thought it was high time that somebody

else took on the Institute. I sensed these changes, and simply didn't want to put that much of my life into it. I was anxious to get back full time into the laboratory. When Stellar left control of the ship, he also came back full time in the laboratory. It shows you in some sense the drawing power of it.

The Interim Years (1980-1985)

Alan Rosenquist:

Professor Jim Sprague was the Director of the Institute and was about to step down as Chairman, and he didn't want the directorship of the Institute any longer. As he put it, he had done this long enough and the Institute needed some new blood. They had begun to look for a new permanent Director, but in the meantime they needed an Interim Director, and they asked me to do it.

The first thing that needed to be done was that the Institute needed a mission -- it needed to be thought through more fully. When I took over, it was a fair characterization that the vast majority of our time in meetings and discussing things with the executive committee was spent on discussing our three shops. They were known as the INS Shops and the big question became: how will they be funded. In the early years of the Institute -- no one would believe this anymore -- when I first came here as a post-doc in '68, something like a quarter of a million dollars was simply attached to Eliot Stellar's research grant to run the Institute. Those where the days when everything was 'hang loose'.

By 1980, things had tightened down considerably and we had this A-21 budgeting and all this other stuff, and you couldn't just support a person, you had to pay for the person on the basis of the time that he or she spent. You could pay fee-for-service at a standard rate.

There were some needed changes, because the shops were in danger of going under. Not necessarily because there wasn't money there, but because the money couldn't be used. There was no organization to it and the transition from the old way to the new way was not an easy one.

So I was asked to run the Institute for a year, and the charge given to me by Stemmler was to go in and find out what the financial situation with respect to the Institute was, to make recommendations, and implement them to get the Institute on a firmer footing vis a vis the shops. So I said I would, realizing of course that I am not a business person but I have a common sense of business.

At this time there was no educational or other mission to the Institute. There was a seminar series, but it really was languishing. You could no longer support post-docs directly from Institute money like you could in the old days. When I came here in 1968, I had a letter that said: "Dear Alan, we are happy to appoint you as a post-doctoral fellow at the Institute of Neurological Sciences, total

salary of $6,000 a year. We hope you will be joining us." Very informal.

Government then cracked down in terms of wanting everything to have much more of a paper trail and more bureaucracy, and it probably wasn't a bad idea either. There was never any hint that it was being done wrong, it was just the way the government worked.

I viewed my responsibilities as being primarily the shops and the finances, and one of the first things to do was try to get a handle on the Institute books - where did the money come from over the last three to five years, and where did it go, and how were these changes effected and how much was each shop costing us.

We had with us a woman who was called a business administrator who was not a real business administrator because she didn't know anything - her name was Dorothy Yentes [sp]. Dorothy is a sweet person and you would love to have her for a mother, but Dorothy was incompetent.

The first thing, I went to the Dean and I said that I needed a new business administrator and he said, go ahead, here's the money, go hire one. I interviewed 30 people or something, and hired a man named Dan Cardoni [sp]. I said to Dan you have to go through the books and he met with enormous resistance. He alienated a number of people, but he didn't alienate me because he did exactly what needed to be done - he went after information and got it. I had actually threatened certain people, who will be nameless, with asking for an internal audit from the University of their books before they opened the books to us.

Finally, we got the books opened up, and we knew where the money was, where it had come from, where it had gone. Then Cardoni and I made projections. If this is the hourly rate we charge for the shop, and this is what we could do with non-federal money, how much should we subvent the shops. If you raise the rates too precipitously, grants haven't caught up with it. So, we worked out a plan whereby we could get the shops solvent again and keep them functioning. And by the end of that first year, it was not without aggravation I might add, that plan was pretty much in place. In the old days the Institute was run like a candy store, mom-and-pop, where you go in in the morning and take the money out of your pants and wallet and you put it in the register and at the end of the day you stuff the money back in, and once a week you may count it. but nobody is really tracking it. I thought Cardoni did a great job. His tenure ended the next year. He moved on to a new job and was not replaced, and Dorothy continued on for two or three more years.

I took this job July 1, 1980 and gave it up June 30, 1981. I was only in the job for less than two full months when I was informed on the day before the end of a grant that we had $30,000 unspent. It turned out that I had enough time because there were bills that were in the hopper

and we just spent them up. But this gives you some idea of how it had been run.

It was a lonely job, and though I had a lot of people supporting me, a few of the established people were very upset that I was depressing Dorothy. The Institute should run so that Dorothy was happy. I gave up the job in 1981 for a lot of reasons. I was tired of it. My wife died in 1977 and I had two young children and I just couldn't take anything else on. I was also running the neural course, and I had six or seven people in my lab. Something had to go. Luckily, Jim Saunders agreed to take it over for another year or two, and during that period of time they began an honest to goodness search and very fortunately appointed Bob Barchi to be the head of the Institute.

At the time I took over the Institute it was drifting aimlessly. It was a very sad time. It didn't have a mission. The Medical School was not about to pump any money or resources into it until it developed a mission, a sense of identity and goals. When I took it over, it was nearly moribund except for the shops.

And yet, it was moribund in a very functional sense. It was really looking for direction, and everyone at Penn had a sense of love and identity with the Institute, even if it was just a seminar series, which was really all it was then. I think there was an annual dinner or retreat at that time, but that was about it. It was like being a member of a club. Like Feynman, the great Nobel prize winning physicist who refused to join the National Academy of Sciences when he was elected. He said he refused to be a member of any organization whose sole purpose was to determine its own membership! I think that is very unkind, but the people here really wanted more, and we have to thank Bob Barchi for the rebirth and renaissance of the Institute. He deserves an enormous amount of credit.

The year I was director of the Institute, I was invited to sit in on the external review of the Department of Physiology here. I was interviewed as to what neuroscience meant to physiology, and I pointed out that there was basically only one neuroscientist in the Department of Physiology, George Gerstein, unless you count the cellular molecular people who maybe worked on something that had to do with neurons. It was really a very focused, very parochial department.

At this meeting, I heard about it from Paul Liebman later, one of the external reviewers of the department was a famous man named Vernon Mountcastle [sp] from Hopkins, perhaps the founder of modern neuroscience in many ways, a very big slugger. Mountcastle said to Bob Forster, who was the Chairman of Physiology, "Bob, you guys really need a Department of Neuroscience." Of course he says, "Well, that's ridiculous. This is the Department of Physiology and we have a Department of Anatomy, why do we need a Department of Neuroscience? We don't have a Department of Renal, we don't have a Department

of This or That - we have a Department of Physiology and there shouldn't be a Department of Brain or Neural."

And Mountcastle said, "Bob, there is something you don't understand. There's a qualitative difference in the analogy. You could know everything there is to know about heart muscle and know a lot about how the heart works. You could know everything there is to know about how kidney cells work and you'll know something about the kidney. You could know a lot about the alveolar in lungs and you'll know about the lungs and how they work. But you could know everything there is to know about a neuron and you will never understand how the brain works. That is the central concept. You have 12 billion of them in there and you could understand the physiology of them in isolation, exquisitely, but it is how they are connected and how they function."

That, to me, was a rallying cry.

In those days, we were fighting an uphill battle because the Chairman of Anatomy, Frank Pepe, said, "Alan, why do you need a Department or Institute of Neurological Sciences? The brain is a tissue. It's like the skin or the toe." But it is completely different. Even the people in Cardiology would admit this. It is much harder than the rest to understand.

This was a vulnerable period for the Institute. None of the existing departments, nor graduate groups, were very interested in giving up any of their intellectual or real estate turf. The trend I just described is still one that we have to reiterate - the principle that you could know everything there is to know about a neuron and never understand the brain. It is one that we have to continuously tell ourselves today even, because of the reductionist fallacy where you reduce everything to more elemental stages. Pretty soon everybody is doing physical or theoretical chemistry because everything is made up of atoms, right, but that doesn't help you when you are trying to understand schizophrenia because it is not a problem with the orb of an atom, of an electron. It is the problem of something else that exists at different levels.

One of the things that Penn has always maintained is the belief that the interdisciplinary and multi-level approach must be maintained at all costs so that you don't look down at somebody who does behavior because they don't use formulas and equations. And similarly, you don't look down at somebody who uses formulas and equations because well, what does this have to do with how the brain works? It all works together and that is why it is such a good program now. There has never been a parochial attitude here.

I was very honored to serve as Interim Director. I felt it was a way I, hopefully, could repay some of the things I owed the Institute. When I came to the Institute, wet behind the ears with a fresh Ph.D., I was given tremendous support. Sprague gave me everything I wanted. This is the thing that characterizes the Institute. I can't

think of a selfish person that has been affiliated with it. You go to a lot of places in academics and you have a lot of big egos and a lot of turf battle. The Institute has, from the day of its inception, been marked by fairness and collegiality. It is other-directed, and it has always looked after its students and junior faculty. It is its etiquette that the senior faculty make sure that the junior faculty thrive as well as the students. And if a student comes to you from another laboratory to learn something, you teach them.

Here's an anecdote: there was a guy named Tom Rainbow who got his Ph.D. here in about 1980-81 in Anatomy with Dr. Flexner. Tom was the ultimate in practical jokes and every year at the Institute dinner Rainbow did some more macabre and strange thing. In those days, you went around at the dinner, it was much smaller, and everyone stood up to introduce themselves. One year, Rainbow got up and introduced himself as Dr. Flexner's parole officer! The venerated Dr. Flexner and a young graduate student named Rainbow! There's a tragic end to the story in that about '82, Rainbow was killed. He'd gone on as a post-doc and come back here, and was killed falling running to catch a train. But he and I were in mortal conflict in terms of practical jokes and he always won. He wrote an abstract for a national meeting that was truly hilarious and somewhat off-color in a scatological sense. He was always up to some diabolical scheme. A very talented guy.

This has always been a place where the students have felt it very easy to go from one to another, to cross lines and departments. There are no turf battles. There is no looking down on M.D.s or Ph.D.s by the other side. No impediment to clinical and basic neuroscience interactions. Your department bears no relationship to how you are viewed. It's almost, and I hate to use this word, it really is like Camelot for the neural system. It is just a group of people who interact in a very, very supportive way. And you can imagine the students pick up on this when they come for their interviews. They just thrive on this, it's great for them. It is an ideal program because by definition, neuroscience is multi-disciplinary.

The reason it is so good now is because of Bob Barchi. But because of the characteristics and standards and values that I just outlined, this was a fertile ground in which to sow the seeds of modern neuroscience. You can thank Flexner, Stellar and Sprague all those years for making that ground fertile. I think you could thank Saunders and me for just watering it every once in a while to keep it fertile, but we didn't do very much beyond that. And then you can thank Barchi for really sowing the crop.

James Saunders:

Al came in as Acting Director at a time when the Institute was extremely weak. The accounts were in horrendous condition at the time, in large measure because this thing was run as a mom-and-pop shop for so long. With a laissez faire, "well what the hell the sun will always rise tomorrow," attitude. As I understand it, Al was essentially brought on board to try and gain a sense of organization and restructure to the financial affairs of the Institute. Al shelled out a zillion and one IOUs. He cussed everyone out from top to bottom and managed to offend a zillion different chairmen, but he did gain financial control back over the Institute affairs. In that one year interim he managed to offend a hell of a lot of people, and some he offended awfully, and it wasn't that he was trying to offend, he was just doing his job. He came to the conclusion that he lost his effectiveness as an administrator and that for the Institute to move forward, he would be bucking the people in an awful way.

In the late summer of 1980, I was asked to take on the responsibility as the Acting Director. The mission given to me by Dean Stemmler was to try and save the Institute of Neurological Sciences because he was very seriously considering advising the Provost that this operation was financially not viable and intellectually in disarray and should be shut down, even though Alan had brought the books under some degree of control and knew what resources we had, what was available to spend, who was responsible for what, what the relationships were in the different property holdings, for instance.

It has always befuddled me why in the hell they asked me to be the Acting Director. I suspect I can pat myself a little bit on the back and say I had a little more even temperament than Al. I had just been promoted to Associate Professor and now I had security at the University, in a sense could go tell people to buzz off and not be worried that my own personal position was in jeopardy. I had been teaching in the neurosciences for a couple of years prior to that and was very active in Institute activities and affairs. I'd had several graduate students come through who were sponsored by the Institute.

I think more importantly, at that time I constituted a bridge between the clinical aspects of the Medical School and the basic science aspects of the Medical School. My appointment primarily is in the Ear, Nose and Throat Department, and yet all of my research and intellectual efforts are in the basic science areas of neurobiology, particularly the neurobiology of hearing.

I think I accepted the position, not because I needed to add bennies or prestige to my own career, but I really had an affection for the Institute of Neurological Sciences. For me, it was a very significant, intellectual part of my

Pennsylvania experience. Being a Ph.D. in a clinical department, there's a certain separation between my M.D. colleagues and their interests, and myself as a basic scientist and my interests. So the Institute had been providing me with enormous intellectual supports over the years. There was a very strong sense of affection for the Institute.

Anyway, those were the antecedents of this and the reasons that I felt it was important to try and contribute. The basic fundamental issue was to try and save the Institute.

Now, that salvaging was accomplished in a number of ways. One was to further the financial position, and this was accomplished by releasing the art and photography shop. and by relocating the electronics shop from Biology over here to what is called Stemmler Hall now. Also by gaining control of the personnel in the machine shop. There'd been a zillion people coming in and out as part-timers and we tried to gain control over that. This was also accomplished by changing the fee structure within the shops so they could recover more of their costs - that the costs would pass on to the user. There was a greater cost recovery.

The second thing was to establish a more broad-based seminar series which could actively involve participation of greater numbers of members. In fact, I remember in those years that we actually took head counts at the seminars so that when I went up to the Dean to argue for the interest and involvement of the Institute members, I could say, "Look, we had over 800 people that attended seminars this year" or something like that. There was quantitative date that there was an interest in this neuroscience enterprise.

The third thing was to involve Institute members in the undergraduate teaching program, and that program is the Biological Basis of Behavior. Others did this and it worked out very successfully, but I encouraged it enormously. Fostered it, mostly. That program was run by Norm Adler, and it was suggested that the introductory course be team-taught and involve members of the Institute in that process. Suddenly you had Medical School faculty crossing over Spruce Street to teach undergraduates. This, again, was to foster the argument that this was big, multi-disciplinary operation involving all facets of the campus.

Additionally, there was an enormous thrust to create a graduate training program in the neurosciences. I can't claim credit for that. This movement had been trickling along for many years. A man by the name of Allen Epstein actually was the one who prepared the document that became the equivalent of the by-laws of the graduate group in neuroscience. That had been languishing for a number of years, and I saw our future as clearly dependent upon having a graduate training program in the neurosciences that the Institute was responsible for as the umbrella organization. And, in fact, I saw this as another one of these key things that could be taken to the Dean.

Indeed, in early 1983, whatever the University committee was that reviews graduate training programs, it gave us their stamp of approval and the neuroscience graduate group came into being. For a very short time I was the Chairman of the graduate group.

And finally, the fifth thing was to convince the Dean that the neuroscience community at Penn was a viable and valuable community, having enormous potential for generating resources, and that the Dean should have the control of the Institute of Neurological Sciences transferred from the office of the Provost to the Dean's office of the Medical School, and then he should appoint a fully salaried Director of the Institute whose full-time responsibilities were to serve as the Director.

Previous Directors of the Institute got a $3,000 allowance. It was not a fully salaried, line-item appointment. It had no financial status as an appointment, a line-item appointment within the University. They were giving me $3,000 allowance a year, Alan the same thing.

Now, I can't sit here and pat myself wildly on the back for this. My role here was to really generate enthusiasm and pressure among my colleagues. There were committees at the time that were reviewing the Institute and trying also to lobby the Dean to create this new formalized structure housed within the Medical School. My role was to encourage this process and I was out on the front line screaming and yelling at people, to get their tails into gear, if they were committee members to get busy and push to get the graduate group facilitated, and going to demonstrate to our seminar series that there was great interest in the Institute. I could not stand here and say that I went to the Dean and said, "Look, Dean, do this and if you don't do this, I am resigning." He would have said, "I enjoyed your stay here at Penn and wish you luck wherever you go in the future!" I can't stand and say I was the force behind it, but I think, with pride, I can look back and say that if I weren't there, it wouldn't have happened.

And it was successful. In September of 1983, there was a search. There were a number of my colleagues who wanted me to apply for the position of Director, and that was very flattering, but that would not have been in the Institute's best interest. What was in its best interest was somebody with an M.D. degree and a Ph.D. degree. Within our in-house individuals, there was little question in anyone's mind that Bob was the individual of choice. It took a little bit of arm twisting and he agreed to accept the appointment.

Then, in the accepted appointment, all the hoped-for things emerged. The Institute was to be the responsible agent for the graduate training program. Responsibility at the level of University administration shifted from the Provost's office to the Med School. The reason that's important is that the Med School is a rich parish and the Provost, even though he's the big cheese, doesn't have the resources that are to be found over here. It was important

to have a good church behind us, so that was the motivation for that.

When I stepped down that September, it was with an enormous sense of satisfaction that the goals that I had set out in trying to save the Institute were salvaged, and under Bob's leadership it has just blossomed and exploded magnificently. If there was a downer period, it's the period of '79 to '80 or '82. Then there was a kind of euphoria that spread through the community as we saw these various new elements: the graduate program, the recognition that a director was needed, shift of the administrative control across Spruce Street to the medical school, and then finally an agreement by the Dean here to take that responsibility and appoint a full-time, very solid individual.

When the graduate group was approved, I guess the one direct thing I can claim credit for is that I did get the Dean to provide us with three graduate student fellowships to start up the program. The bloody committee and the University approved the graduate program in very late April, early May, something like that, and a week or so later the Dean gave us three fellowships for graduate students. There was a time I was convinced he was going "ha, ha, ha" because in late May, or mid-May, it's as hard as hell to try and find three graduate students. He was very obstructionist, against the formation of an Institute in a more formalized sense. He was very much into the retrenchment of programs, and anything that was new he wanted out of his hair. He didn't want the responsibility for it. This is why it was a long and uphill battle to convince him that this was an important and viable community.

This is early '83 we're talking. He gave us these fellowships in May, full-well knowing that all graduate students had accepted back in March. And I got my colleagues to scour the country and we found three kids. They weren't the best. One of them was a fairly recognized ding-a-ling. I can remember my colleagues angry as hell at me because we had given out two of the fellowships and I had a third one left and I didn't care, as long as it wore pants and wanted to go to graduate school, it should have a slot. And we found one that just wore pants and wanted to go to graduate school! I paid the money to that kid and I went back to Stemmler and said, "Jesus, we had so many applications and we filled them easily and filled all your slots and I really appreciate it and if we could have a fourth one next year, we'll fill that one too!" In reality, Stemmler was quite impressed by that and was surprised that we could fill the graduate program. Whether it was easy or not, I never told him in great detail!

There were about 82 to 86 Institute members then, and these were all full-time, fully funded faculty scattered across the campus in Arts and Science, Veterinary School, Dental School and Medicine. I don't think we had any engineers at that time, though we certainly do now. There

were maybe between 30 and 35 associate members, as they were then known, that would be graduate students and post-doctoral fellows. It was a big operation.

We were just at the start of the great advances in the cellular biology of the nervous system, and the hints on the horizon were there of the advances to come in molecular neuroscience. It was clear to many of us that the field was poised for an explosion, an intellectual explosion, in the biochemical and molecular areas of neuroscience. And indeed, that has manifested itself.

Bob was at the forefront of that explosion at the time, looking at cellular mechanisms in terms of protein channels in neurons, and so his personal research was hot at the time. His research was nationally recognized, and of course that recognition has continued here. He was just appointed to the National Academy, which is a very prestigious appointment, honorific.

Eliot Stellar and Jim Sprague are individuals who have played a very, very significant role in my academic development here at Penn. I describe them to others as my academic mentors. Eliot is an individual I have gone to on many occasions and asked advice on matters of my own professional direction, and his counseling has been nothing short of spectacular. There are many, many others who do the same thing. Jim Sprague and I have worked together since 1976 and he too has had an enormous effect on the way I view my role as an academic. Both those guys are gentlemen of an extreme sort. They are patient, giving people. Eliot is probably the most selfless man I've ever met and Jim Sprague is right behind him. In that sense, the assumption that one gives to one's colleagues in an unselfish way without worrying about time constraints or anything, has permeated a whole generation of faculty here in the neurosciences.

Jim Saunders

Rosenquist clearly comes out of that mold. This whole generation of us, in the range of 50 to 55 now, have had a ~~rather~~ significant impact placed upon us in terms of the role models that Sprague and Stellar have provided. And the Sprague and Stellar role model flows from Flexner, from an earlier generation. The whole Institute is based upon, in large measure, volunteer service. This sense of being able to give to the better enterprise of a larger organization, without any expectation of reward or remuneration, has been an incredibly pervasive attitude throughout the members of the institute.

I would hope, and I see it in my generation of colleagues, that some sense of that might be transferred ~~on down~~ to the next academic generation. We see that in guys whose ages range from 30 to 40. There seems to be this whole other group of younger folks who have the same sense of contribution to a bigger enterprise. That flows from this incredible generosity of Sprague and Stellar - generosity at all levels. When they had money to control,

they were generous with it. And beyond that, generous with their time and their ideas and their service.

In that sense, I think early, early on, this is what turned me on to this enterprise of individuals here. This sense of collegiality, congeniality, this sense of giving to other colleagues. This is very hard to articulate but I feel very strongly about it.

It is one of these beautiful things in life where people just do something for the love of doing it. We live in a world now where students and faculty are always looking for something. What do I get paid for this? What are my credits for this? What are my course grades going to be? What am I going to get out of this?

Jim Saunders

I never ever had that sense with those guys Stellar or Sprague. There was this incredible sense of giving - giving of time and personality. ~~They have been very significant role~~ models. ~~Actually, I use a word that my colleagues sort of crow at, but I think~~ Eliot and Jim Sprague were in love with ~~the rest of us. They were in love with~~ the academic life. They were in love with the intellectual freedom afforded to them and they were respectful of that. And we returned that love. ~~Colleagues don't like me saying that out of context, but that's the way I felt about it over the years.~~ And others have come to share that same kind of love for the Institute. And our colleagues try to return it in the same measure it was given to us. I hope that continues as long as it can.

The Barchi Years (1985-present)

Robert Barchi:

There was a lot of discussion around 1982 about what the future of neurosciences on campus should be. There was a task force that was formed by Ed Stemmler, and the major discussion had to do with what form neurosciences should take on campus. The kinds of models that were considered were one, a Department of Neuroscience, and two, something like an interdepartmental Institute. What we had at the time was a fairly large faculty who were doing neuroscience, but not really integrated in any clear way. We had no graduate program and no educational program in neuroscience at the graduate level. But there was this Biological Basis of Behavior program which was in place then at the undergraduate level. So in parallel with the working of this committee, there was a separate group of about four or five of us working toward establishing a graduate group in neuroscience. And those two things were moving forward independent of each other but at about the same time.

The Institute at that point was still what it had been for many years, which was largely a loose confederation of faculty brought together for purposes of collaborative research, run primarily out of the Anatomy Department. It was not a very effective group in terms of University policy or in terms of setting the direction of neuroscience. It was more of a club, and it wasn't very well resourced. It was run out of the Office of the Provost with a nominal budget and not very much attention from anybody. So the real issue was where we were going with neurosciences on campus, and this task force addressed that issue.

What we decided was that we ought to capitalize on the visibility and name recognition of the INS, keep the same name basically, but change the Institute into something with a much broader scope, something that had a truly University-wide mission in education and development, fund raising and public relations, and in faculty development and recruitment. A programmatic development. And those things should be brought together under one administrative structure. Initially we were still thinking of running it out of the Provost's Office, but very quickly that got moved to the Dean of the School of Medicine as the responsible Dean acting on behalf of the other Deans in the University.

So the Committee report came out that we should strengthen and expand the Institute, build on that as a model for what we wanted to create, to resource it centrally, to provide it with a certain number of recruiting physicians and to build it around a graduate education program. At the same time, the Committee working on the graduate group had formulated a proposal which goes through

a separate set of channels and that had worked its way through the University and we had approval for the formation of the graduate group. There was then a search committee to look for a new director, and the net result was that I negotiated with Ed Stemmler, who was the Dean then, to take this job and we worked out a letter of agreement that included these various elements. Very quickly, we had a graduate curriculum started and we had accepted three graduate students in the first year and had started thinking how we were going to expand the educational program.

The first thing we did with the Institute was to have a University-wide retreat, and that was the first of many. It was the prototype for retreats that are now held by many different centers and departments in the Medical School. There were none before the Institute had its first retreat. I would say that we probably had 150 the first time out, whereas we have 350 attending it now. Basically we had a number of sessions reviewing various areas of the neurosciences. It was a day-long event and an evening dinner that set the tone for the retreats that have been held subsequent to that. We brought under the new Institute the older functions of the Flexner Lectures that had been present before, and the seminar series that had been run before, so now all these things were administered through the Institute. And we made the Flexner Lecture a little more formal so that the dinner afterwards included a broader group and was seen more as an opportunity for all the faculty to get together.

During that first year or so, year-and-a-half, we had the planning and construction of the conference facility and the library and the administrative offices. Those all came on line. And at the same time, we were busily looking around for funding from external sources.

About 1984 we finalized things with David Mahoney. David was an alumnus of Penn. He was a basketball player, and was a Trustee of the University. He is a former CEO of Good Humor and of Norton Simon and of a number of other companies along the way -- a very, very successful businessman who was interested, as it turned out, in neuroscience. They were trying to get him to donate money for athletics and he wanted to hear more about the brain. And so they sent him over here, we set up a presentation for him with key Institute faculty, and really turned him on. We first turned him on to endowing a professorship in the neurosciences, and then in subsequent discussions to donating more money and sponsoring the Institute itself. He created a fund that, over a period of four or five years, generated the endowment for the David Mahoney Professorship in Neurological Sciences. And he made an irrevocable bequest of additional funds that would be used for the activities of the Institute itself. At that time the Institute was named the David Mahoney Institute of Neurological Sciences.

Somewhere along in that time frame, we had a big dinner up in New York to which David invited all of his friends and acquaintances and society mates and whomever -- from Senator Jacob Javits down to Dan Rather and all the people in New York -- at which the Institute was basically launched. We had a presentation and discussion with them and it was quite a fun night.

So over those early years, the emphasis was on expanding neuroscience on campus in areas of which we were particularly weak or were perceived to be weak. The graduate group over those early years was growing rapidly in terms of the pool of applicants, the quality of the applicants that we were taking, and the number of courses that we were offering. We were actively assisting in the recruitment of other key faculty for the University in various departments, and trying to build programs in computational neuroscience and developmental neurobiology with the recruitment of John Raper and Tom Abrams, Leif Finkel in bioengineering and a number of other faculty who we participated with. The annual retreats became a widely applauded part of the program and the attendance just went up every single year. It's still going up.

What really developed was an esprit de corps among the faculty that I don't think was there before. A feeling of solidarity, of being able to do things and being able to move as a group, of being able to influence the course of those who affect change within the institution. A sense of what we could do as an Institute that couldn't be done by individual faculty. There seemed to be more faculty coming together through the Institute to accomplish things, and people looking to the Institute as their academic home and the route through which they had the most leverage to get things done. And that was a gratifying change.

At the same time, I think the Institute gained a lot of recognition at the University level as a force to be contended with and as something that was moving. Both the President, Sheldon Hackney at the time, and the Provost, Mike Aiken, were very favorably disposed toward the Institute and looked at it as one of their model programs, as a one-University concept, something that really did cut across the Departments of the schools and worked efficiently. They were very supportive of our programs.

We picked up donations from a number of other sources in those early to middle years. The Alexander Foundation provided us with the funds to endow the maintenance of a library, for example. The Hearst Foundation provided us with funds to back up our graduate student recruitments. The Dana Foundation, which is influenced by David Mahoney as the Chairman of the Board, made a number of contributions to the Institute to set up new programs and spin off new directions -- both the Charles and the Eleanor Dana.

Our goal was to establish new initiatives that then could be spun off on their own. For example, the initiative in sleep research, the neurobiology of sleep, was initially

a three-year program funded by the Eleanor Dana Foundation, through a grant to the Institute, bringing together faculty from Medicine, Neurology and Psychiatry, that grew and prospered and subsequently spun off a clinical program currently sponsored by the three of them under the hospital's aegis. It has since created its own Institute under the leadership of Allan Pack. That whole thing started as an INS program and it's those kinds of programs that we're interested in fostering. Those things were happening during the middle years.

About '86 or '87, an agreement was reached between all the principles, the Dean, the President, the Provost, me and David Mahoney, for additional funding for neurosciences that included monies from the Provost's Office, monies from the Dean's Office and monies that David would put into the system. We gained additional funds for the Institute endowment that allowed us to set up a number of additional recruitments at the University-wide level, and to create space for the Institute for the first time. We were thinking in terms of generating physical space beyond the conference facility and the library that would actually house investigators. So we designed and renovated 10,000 square feet of space that would house the administrative offices of the Institute and would house lab space for a number of neuroscientists that would be recruited or moved into the space because of the nature of their interactive research. It was at that point that I recruited John Lindstrom [sp] as Trustee Professor of Neuroscience in pharmacology, the Trustee Professorship being a part of this package as well.

Around that middle period of time we began The Forum, which is another instrument for publicizing the activities of the Institute. That took the form of a glossy, eight-page, professionally done newsletter that would typically highlight areas of research activity in the Institute. It goes out now to probably close to 25,000 neuroscientists and interested individuals throughout the country.

We started a seed grant program for faculty members on a competitive basis that would provide start-up funds for new initiatives and collaborative research that we've been able to run every year since then. We also initiated through the Institute a number of awards for faculty to recognize outstanding teachers or outstanding contributors to the neuroscience community.

That would bring us up into the early '90s. It was at that point that we decided to establish a Department of Neuroscience within the School of Medicine. The reason for doing that was that, over the intervening years, it was becoming increasingly difficult to recruit the very best faculty members in neuroscience. In some areas we were in competition with other key Medical Schools that had departments, and these faculty would prefer to be in a Department of Neuroscience rather than jointly appointed in an Institute at a Department of Anatomy, for example.

Here, the Institute of Neurological Sciences had grown to the point were it was so strong and such a dominant force that it was not going to be offset by a Department in the Medical School, that we weren't going to disenfranchise the faculty members who were not in the Medical School by creating such a department. So we went through a fairly careful review of our position with a number of subcommittees within the Institute, working to write white papers that culminated in a day-long meeting of all the faculty members to discuss the white papers and the positions that we were going to take, and to reach agreement that we would in fact create such a department and move forward with it, and agreement on other issues that had to do with education and development. So the Department was formally founded in July of 1992, and now we have a Department of Neuroscience in the School of Medicine, as well as an Institute which is the over-riding umbrella for neuroscience on campus. As far as I'm concerned the Institute is the imprimatur for neuroscience. If you come to Penn and you want to be a member of the neuroscience club, you petition for membership in the Institute, not for a joint appointment in the Department of Neuroscience. So the Department is a subset, or one of a number of pillars that help to support the Institute. Other ones would be the Department of Neurology, Department of Psychiatry, Department of Psychology, the various other areas in the University that have concentrations of neuroscientists. And the department focuses on certain areas of neuroscience, specifically molecular, developmental and systems neuroscience. Now other areas of neuroscience like cellular neurobiology and computational neuroscience, behavioral neurobiology, are still developed as joint recruitments through the Departments under the Institute, under the aegis of the Institute. And that's worked out pretty well. The Department of Neuroscience has now grown to about 15 faculty members and 25,000 net square feet, and we will have, by the end of next year, probably 18 faculty members and we'll be looking to expand beyond that.

Somewhere in the mid '80s a lectureship was established in honor of Jim Sprague, with donations from a large group of his friends. That annual Sprague Lectureship was combined with the retreat so that the key afternoon lecture of the retreat is the Sprague Lectureship in Systems Neurobiology. More recently, we have established a visiting professorship in honor of Eliot Stellar, and that provides funding to bring a professor to the University for a week and to support a key lecture by that faculty member. That lectureship is tied to an annual get-together of faculty members specifically interested in behavioral neuroscience, which we call the behavioral neuroscience retreat. It's a mini-retreat that's held typically in September. So the funds that were gotten for that professorship are key to the behavioral retreat.

This year we have gotten another endowed lectureship from Dr. Craig Elliot [sp] on the neurobiology of human behavior. We'll have the first Elliot Lectureship in December, another on our list of sponsored events with external support. So now we have something for all the ex-Directors, as it were.

Over the course of the years, we have put together a number of large programs within the Institute that have supported activities in a variety of Departments. These are key programs that really underscore what the Institute is all about, this kind of interdepartmental approach. One was Eleanor Dana Sleep Center. Another was the Charles Dana Fellowship Program in Neuroscience that sponsored post-clinical fellowships for people finishing clinical neuroscience residencies in neurology, psychiatry and neurosurgery to do additional training in basic research. We tried to encourage them to have careers in academic neuroscience. That ran for five years and was very successful. It was one of five programs in the country that were supported for that five year period. More recently, we've just started a big new program called the Dana Initiative in Cognitive Neuroscience. Again, it's one of five such programs around the country that focuses on cognitive decline in the elderly, and it asks questions about mild to moderate memory loss in the older population, and the role that depression might play in that and what kinds of things can be done to treat it and what's the path of physiology of it. These are patients who do not have Alzheimer's disease but a mild cognitive dysfunction. The program brings together key players from Psychiatry and Neurology to a joint clinical enterprise.

So those kinds of programs are the kinds of building we're trying to do. The hope is that these programs would then spin off their own ongoing activities involving those departments, and would no longer need the Institute's sponsorship. The example would be the Dana Sleep Program, which is doing fine independently now.

And over the years, the number of faculty in the Institute has grown steadily from about 80 or so when I took over, 70 or 80, to almost 140 now. I've been asked by many institutions to go and be a consultant to them in terms of how they can build a program like our Institute in their institutions. Ours is a model for many such programs. Interestingly, I don't think it works in that many places. The Institute works at Penn in part because of the sociology of this University! The fact that the University is all on one campus, it's been that way for hundreds of years. The fact that we have a long tradition of interdisciplinary programs that cut across departments and schools, and the fact that the Institute itself has been around since the 1950s. So this was not a novel approach to organization. What works here works very well, but it simply doesn't work as well in a school that is more parochial, a Harvard or a Hopkins or a Yale. It's very difficult to do those things

there, because there are turf battles between departments and between schools that get in the way of the academic programs of the institute. Here, those weren't an issue and it's been very easy to do here what would be very hard to do in other places.

There was a tradition and a history in the early Institute that made clear it was there to benefit the people who worked in it, especially the students and trainees and fellows, as well as the young faculty. Certainly Lou Flexner, when he started this thing, started it as a program that would help to train young students as well as to bring together a group of faculty that were interested in neurobiology. Both Jim and Eliot are very, very institutionally oriented people whose primary concern was making things work for the school and for the faculty as opposed to anything that smacked of self-aggrandizement. And I think that has set the tone for it.

We've tried to continue that with the expanded Institute. It exists for the purpose of benefitting neuroscience on campus, and not for the purpose of making any one department richer, or any one particular faculty member famous. I think, by and large, it has succeeded. Its success is due in a large part to the degree with which the faculty perceive it as being that kind of thing. They feel part of it. People feel that it's a big family, they enjoy interacting with each other and the reason they come to the dinners and the retreats is that they enjoy doing it. They have a good time with each other. And out of that comes a tremendous amount of positive benefit in terms of science and collaborative research. Interactions that wouldn't have taken place otherwise are very easy to start and to maintain. It's a very easy environment to recruit people to, because once they see it they want to be part of it too. It's very different from many other institutions. And it also gives us a very strong voice, because when we get together and decide among ourselves that we want to do something, we argue it out and then it's done. We all get behind it, and we can create a fair amount of academic pressure to see the program pushed through and succeed.

Eliot Stellar:

It's a marvelous thing that all the past Directors are still here. Flexner's 92. I'm 73. Sprague's 75. Bob is 45 or less. With Bob we've been friendly but hands-off. We offer to help if needed, but we also recognize that the Director doesn't need somebody looking over his shoulder. That goes back to the old days, that's how we used to do it. I served on Bob's executive committee for a number of years and was always very cognizant of the fact that it's his show and if I could help, fine. And if I couldn't help it was time to shut up. The Institute was the entity we were all

working for and towards. Sprague and I have published together, and Flexner and I published together on a memory problem. I've never published with Bob, but I spotted him when I was Provost. He'd just finished his M.D., Ph.D. program and he had a big offer from Texas. His department chairman didn't want to lose him and thought that maybe if he'd talk to me, to the Provost of the University, that he'd see the value of staying here. Well, I had known Bob as a student, and he came to see me and I told him it was a dumb thing to go to Texas. We had it all here, and he had a great future here. Well, it worked out that way and he stayed. It was a matter of nurturing one of our most exciting young faculty and trying to open his eyes to the promise of the Institute for him and his career. We are all interwoven. Sprague and I knew each other, Flexner and I knew each other at Hopkins as well. That's all for the good. Certainly we've been friends, and respected each other in personal and social ways as well as intellectual and academic ways.

Robert Barchi:

I think it is extraordinary that we have all the past Directors here, and I think it is really a tribute to what the Institute is all about that people don't leave. It's not as if these Directors stayed for a few years and then got recruited off to a better position. The tendency has been for a Director to be the Director until he retires. And I think that's almost unique. I don't know of another place that has every single Director that ever has served still in place in the same institution. They all are active participants in the Institute's activities, and are a tremendous help to me as an intellectual resource. Anything that needs to be done, they jump in and do it. That includes the Acting Directors who are both thoroughly active in the affairs of the Institute, as well as the past Directors. Lou Flexner has just been an inspiration for everybody. He's still very actively involved. All of them are actively involved in research, but Lou, in his nineties, is really amazing. He has always been an institutional person, willing to get up at an Institute dinner and say whatever needs to be said, and giving credit to whoever deserves it. He's tremendously popular. But Lou and Eliot and Jim are all that way, and always have been.

Eliot, of course, went on to be Provost and is back now as Chairman of Cell and Developmental Biology. He probably is the prototype of the self-effacing institutionally oriented leader who is talented, one of the world's foremost figures in behavioral neuroscience. He wrote the text book that everybody uses in behavioral psychology, and he's a world expert in motivation and affect. Yet if you talk to

him, you'll come away feeling that his only concern is what you're doing.

They've been tremendously helpful to me, it creates a feeling of family. That's an important element of what's here. And we mourn the loss of the people who we don't have with us, like Alan Epstein who was killed in a car accident several years ago, and Tom Rainbow who was killed a decade ago now in a train accident.

We don't see a whole lot of people who leave to move to greener pastures. It's hard to find greener pastures than what we have here. I think that generates a lot of the "warm puppy" stuff that you feel as a member of this Institute. There is a tradition and a feeling of camaraderie and collegiality that's unique here.

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