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The Princeton Mathematics Community in the 1930s
Transcript number 24 (PMC24)

JACK LEVINE

(with ALBERT TUCKER)

This is a telephone interview with Jack Levine at North Carolina State University in Raleigh. The interviewers are Albert Tucker and William Aspray at Princeton University. The date is 11 October 1984.

Aspray: I thought we'd start out by asking you how you came to Princeton in the first place?

Levine: I was at UCLA as an undergraduate, and after I finished there in '29, I taught there for one year as an instructor, a full-time instructor. That gave me till '30, and then I applied to one or two places for graduate work. One of these was Princeton, and fortunately I was accepted there.

Aspray: Why were you interested in Princeton?

Levine: Well, I can't remember that. Maybe one of the professors suggested it. That probably was because I didn't know much about schools giving graduate work. You see, at UCLA there was no graduate school then, so I had to go out. Princeton was just one choice. I can't recall the reasons if there were any. I think one of the professors suggested it, because I didn't apply to many other places.

Aspray: In the long run were you happy with your choice?

Levine: Couldn't be happier. The very best place I could have chosen.

Aspray: Why is that?

Levine: Well, for various reasons I'm going to discuss. Of course, in any place, a graduate student you know is not always happy. He's got a lot to do, and he's got a thesis to consider, and in those days there was the Depression. The reappointments came out annually, and that also was a worry. But on the whole I was very, very happy there, and I couldn't have picked a better place.

Aspray: Fine. Since you have some topics prepared, would you like to just start in?

Levine: Al suggested the following: faculty, fellow students, the common room, foreign visitors, and things like that. Does that cover it pretty well?

Aspray: That sounds good. Why don't we start with faculty. I understand that you did your dissertation with T.Y. Thomas.

Levine: Right. He also asked me some questions about his obituary. Anyway, in those years there were about five members of the faculty that taught graduate work; some faculty members didn't. There were Thomas, J.H.M. Wedderburn, Einar Hille, Solomon Lefschetz, and Luther P. Eisenhart. Oswald Veblen was then head of the Institute for Advanced Study, so he didn't do any teaching. Also H.P. Robertson taught a course in relativity and many of the math students attended that, including myself. It was practically a mathematics course.

Now, Al wanted me to discuss each one of those and to tell what I feel. Now I know Thomas the best, of course. I was always impressed with the way he dressed. He always wore a bow-tie and was very neatly dressed. After I knew him a little better I discovered he was really an enthusiastic research person. He always liked to work in research. In fact all of those people did. They were all, every one of them, writing a book at that time—the ones I mentioned, except maybe Hille. I didn't know that at first. Naturally their courses were related to their books, so they kind of talked about their books for a while.

Thomas gave a course in tensors. There were about ten students who came my year, in 1930, and I'd say at the end of two years about half of them had left. That left maybe four or five, whose names I'll mention in a little while. In this course he required the students to give reports during the semester. He didn't tell us that for a while, and the report he gave me was unfortunately written in German, a top tensor work. I read it the best I could, and I finally gave my report. It seemed all right, but there was one point in that paper which neither of us could understand very well. I finally figured out what it was. This was the evening. I called him up, and I told him about it. He immediately wanted me to see him. He wanted to go over to the building to talk about. This was at night. So of course I went over and explained it. This illustrates his enthusiasm. He didn't say come tomorrow. He wanted to figure it out right away.

I worked with him. I wrote about two papers with him while I was a student, and I observed that he really was a brilliant person. He

would do these very complex calculations in tensor work, and he did them easily. I never could figure out how he did those, because I always had trouble with these things, these really elaborate calculations. That impressed me very much. We worked in his office. This was in Fine Hall then. The year I came it hadn't been completed yet.

Tucker: We moved into Fine Hall in 1931. Thomas's office was a ground-floor corner-room.

Levine: That's right, on a corner. These were very elaborate offices, the whole building was that way. Every once in a while, his wife would call up and give him a grocery order.

Now, Al asked me about the obituary notice. He didn't know of any. One appeared in the *American Mathematical Monthly.* It was this year, I believe. I happened to read it.

Tucker: Well, he died early this year, so I'll look in the *Monthly* for that. Thank you.

Levine: Another thing. He went to Rice University as an undergraduate, and somewhere I read not long ago that Rice University has started an annual award that is given to outstanding students, past and present. This notice said that Thomas was given the first award. It was given this year. I just read this a few months ago.

Tucker: Yes, Rice was a very good place for mathematics at the time when Thomas was there because of Griffith Evans, the mathematician who later became the head of and built up the department at Berkeley.

Levine: Seeing this notice, I thought of you. You wanted to know something. The obituary for the NAS ...

Tucker: National Academy of Sciences.

Levine: Yes, you wanted to know if that had been done. I thought the people at Rice might know something about that. If they gave him the award this year, you see, it might be an idea to write to Rice University and see what they can tell you.

Tucker: Yes, very good.

Aspray: Can you tell me something about how Thomas was as an advisor of graduate students?

Levine: Let me see. I don't think they had advisors of graduate students. The only ones he would be advising would be the ones for whom he was directing the Ph.D. thesis.

Aspray: Yes.

Levine: In those years they didn't give master's degrees. I think they changed later. All I can tell about is his relations with me; he was very cooperative and spent a lot of time working on things with me. We were writing papers together, so I observed how he was then. As far as I can remember nobody advised graduate students about their first two years; after that they got into writing a thesis. Tests and examinations were not given in those times, so the students didn't worry too much about courses. So I guess they didn't need any advice. They just had to come to class; they knew they weren't going to get graded or anything.

Aspray: When you were working on the joint papers with him, how did you break up the work?

Levine: Well, he did most of it. He suggested the problem. This was in about my third year I suppose. We came to a place where he said, "I wonder if such and such is true." So I would go out and look up all the references in the library. If I was lucky, I would find that somebody had actually proved the theorem that he was hoping was true, so that helped out. But we sat there together, and of course he did the writing. I didn't have any experience in that. As I say, he did most of it, but I helped.

Two people don't *write* a paper together, as I've learned from doing joint papers here for many years. Usually one person will get started on it, and then something will come up. Then the other one will say, "Well, I'll try that part." They don't work simultaneously. They'd get into arguments all the time if they did. They wouldn't get anything done. But with him, of course, he assumed the greater load of the work. I was just sort of a beginning student to him.

Aspray: Can you tell me something about the other students that were writing dissertations with him?

Levine: There was one other, Edwin Titt. I am coming to him in the student set. You're about a year or two ahead of me.

Tucker: You go ahead and talk about members of the faculty, and then we'll come back to the students.

Levine: Well, I don't have much on the others. Wedderburn worked in algebra. He was already a famous mathematician, although I might not have known it. He was a very quiet man, always serious; you never saw him smile or anything. He lectured in class; he was writing his book on matrices at that time, and I think his notes were based on that. There's nothing unusual there except that everybody always used a capital letter to designate a matrix, but he always used small letters, which caused confusion. Nobody ever complained about it, but when he'd write a little x on the board, well that didn't mean a matrix to anybody; he'd have to have written a big x.

He was, as I say, a very famous person then, but you wouldn't know it just talking to him or listening to his lectures. You'd never

see him except in the classroom. I don't know, I guess he stayed in his office all the time. Now I took that course before we went to Fine Hall; it was in Palmer Laboratory, the physics building, which is right next to Fine. All the math department was located in Palmer Laboratory.

Aspray: Yes.

Levine: During the first year there wasn't many classrooms available; the physics department took them up mostly. So we met in a room that happened to be right next to where Fine Hall was being built. We'd hear all the construction noises, the hammering and such, which were certainly disturbing to the students. I didn't know what it was at first; I soon found that out. That's about what I can tell you about Wedderburn. He had two students, the most famous of course is Nathan Jacobson, who later became quite famous in this country and throughout the world. The other one was Mérrill Flood. Jacobson became quite famous. He's a former president of the Math Society and wrote a lot of books. I'll come to him in a little while.

Now Professor Hille taught real and complex variables. My first year, he was doing real variables. He always wrote out his notes. Some of the professors didn't have any notes, but he had very carefully written notes. I was appointed what he called the official note-keeper. I would write notes as he talked, but then always at the end of the hour he'd give me his notes. I'd rewrite them and try to clarify difficult points. I spent quite a lot of time on it, but it helped me a lot just doing it. The following year he taught complex variable, and Malcolm Robertson took notes.

Hille also required reports by his class, that is, oral reports for maybe one or two lectures. Not all the professors did this. I had to talk on what's called the Riemmann Zeta function. I had a lot of trouble. It was extremely difficult. A beginner then, I didn't know much about it, so it took me several months. These reports were rather important, because I think the faculty judged the caliber of the students on the basis of them. Students didn't get any grades you see, and the faculty needed some way to judge them. Those were the only two classes that required reports, which was fortunate. Bohnenblust was one of the older students. He was ahead of me a couple of years, and he was working on a real-variable thesis, so I'd ask him questions occasionally and he'd help me out. So I had this report and the one for Thomas' class. These reports might last three or four lectures, so it took quite a while to prepare a good report.

Now Dean Eisenhart gave a course in groups, Continuous Groups of Tranformations, second term. I might mention that every graduate student seemed to go to every class, the first year anyway. We just went around in a group, so we got to know each other pretty well. Eisenhart was a leisurely speaker. He never raised his voice much, and he liked to sit down when he was talking. He had a desk there, and he would sit at it. Of course he had to get up to write on the board occasionally, but that's the way he taught. I noticed that in

other courses that I had with him. He was also writing a book, and after the book was finished he followed it pretty carefully.

Tucker: A Princeton University Press book, *Continuous Groups of Transformations*.

Levine: Well, this was in transformation groups.

Tucker: Oh, *Transformation Groups*.

Levine: As I mentioned every one of these professors was writing a book at that time. Maybe just a coincidence. That was good in a way, because they had something to talk about. Now my last year I acted as Eisenhart's research assistant; that was after I got my degree. I would check over his papers. He'd write a paper and tell me, "Look it over and see if you can find mistakes." That was my main duty, and of course I had to be sure that I found it if there was a mistake.

Aspray: Did you find mistakes?

Levine: Yes, I found a rather serious error in one of his papers. I don't know which paper it was. So he had to do it over, or part of it, and I guess he appreciated that. I did the same sort of thing with Thomas' papers. He was always writing papers; in fact, his first book was sort of a collection of his papers. He gave me several to read. I never found any errors in those, but I found places I couldn't figure out and then he'd show me how to do it. Thomas was working in my area—or I was working in his area—and Eisenhart's partly so.

There was an amusing incident the first week I was there. You see, besides being Dean of the Faculty Eisenhart was head of the department, so he had each new student come for an interview over at Nassau Hall. I happened to be wearing a pink shirt that day, and I noticed him looking at that. I didn't realize it was pink, I just put it on. He said, "You're from California aren't you?" I guess he knew where I came from, and he added, "Well, people from California dress that way." I had white shirts too, which I put on later.

Now, Lefschetz taught topology. I couldn't get very interested in that because he taught it right after lunch. I got sleepy right after lunch, so I kind of lost interest, which is unfortunate because I understand he was an excellent teacher. That was a popular subject at that time. He had just finished writing his book on topology, one of the pioneer books as I understand it.

He also was in charge of giving the language test. All students had to pass a reading test in one language. I picked German since I had read in that and had had courses in it. I thought I was ready. And so I went up to him, and he took out something and said read this. He didn't show me the cover of the book, I looked at the paragraph, and I had some difficulty. A lot of the words I'd never seen before. I struggled with it for a while. He said, "Well, that's good enough." Then I found out he had given me a book on

astronomy. I expected a book on mathematics. I don't know if he did that with everybody, but I was a little bit puzzled about that. You see, at UCLA Professor E.R. Hedrick, head of the department, who became well known and was also the provost (later), gave some of the mathematics students a little course in reading mathematical German. So I expected to do well in the German and was a little disappointed that I didn't know the astronomical terms.

Now Veblen was not teaching then, because he was head of the Institute.

Tucker: Well, he was a research professor.

Levine: Yes, and he gave seminars. I'll come back to him in a moment. There were two others, Morris Knebelman and Alonzo Church. I don't think they taught graduate courses. They taught undergraduates. You see, I was teaching also, and Knebelman was teaching in the same area—elementary calculus, algebra, things like that—so I was quite close to him. I worked with him a while in teaching.

Alonzo Church's area was mathematical logic. He had some graduate students, but I don't think he had any graduate courses. Eisenhart didn't have any students because he was Dean of the Faculty and head of the department; I guess he was too busy. Lefschetz did have some students; Walker was one of them. Wait a minute, I think Eisenhart had Tucker as a student.

Tucker: No, it was Lefschetz.

Levine: Well, I mentioned the fact that there were no tests given. That may not have been too good, because the students just sort of sat in class. They knew they were never going to be examined. They did know that eventually they were going to have to take the final oral exam for the Ph.D. I guess they started studying then, but it helped a little to know at the beginning that you didn't have to worry about tests.

Aspray: If you were to compare the teaching skills of the various people, what would you say about them?

Levine: That might be impossible to answer. They were teaching completely different subjects.

Tucker: In completely different styles.

Levine: Yes, every one of them. They were so full of their books. These people were good teachers in that, because they were working on their books, they knew the subjects perfectly well. But let me think a minute. The courses they were giving were standard graduate courses, and far as I can see they all did a real good job at it. They'd answer questions if you asked them during class time, and also I suppose if you went to their office. Now I never did that, but they'd probably

take time to tell you anything you wanted to know. It's kind of hard to compare two teachers, unless they're teaching the same thing and you can go from one to the other on the same lecture.

Tucker: Let's turn to the students that you can talk about.

Levine: My class, as I called it, the ones I remember out of ten, were [Robert] Walker, [Nathan] Jacobson, and [John] Vanderslice. They stayed all five years, I believe. The rest of them dropped out at the end of one or two years, so I don't remember even the names of some of them. Now when we came, there were already several students, like Titt, Tucker, [J.H.C.] Whitehead, Bohnenblust, [J.L.] Barnes, and James Singer. These are the ones I remember. They had already been there a year or two. Then the year after we came, the ones I remember were [Stephen] Kleene, [John Barkley] Rosser, [A.H.] Taub—who was in the physics department—[Merrill] Flood, and [Malcolm] Robertson. So that group, the ones I just named, we all more or less stayed there all the time, four or five years, so we got to know each other pretty well. The other students either left, and we didn't know what happened to them, or they came a couple of years after us, and we were so far ahead of them that we didn't notice them much. Each group kind of stuck together.

The ones I mentioned first—Walker, Jacobson, Vanderslice, and myself—we stayed together a good bit in Fine Hall. Most of the students had fellowships, which meant they had to live in the Graduate College and eat there. They didn't like that. I was appointed, I mean given two classes to teach. I didn't have a fellowship, and the others were sort of envious of that, because I could live wherever I wanted to and eat wherever I wanted to. They were restricted, but later on they relaxed those restrictions. I had what I called a princely salary for teaching two classes. The salary, I believe, was almost double the fellowship value, and maybe they didn't like that so much. Anyway, I'd already had a year's teaching experience and those others hadn't. Well, Robertson—I'll give you his full name, Malcolm Irving Slingsby Robertson—is from Canada. We rented rooms in the same house on Bank Street. He came my second year, I believe. We also ate at what was called Zapf's Boarding House on Nassau Street, a very popular place where faculty and graduate students and the clerical staff at Princeton ate a pretty good sized meal. Then after a bit—I don't know after how many years—we moved over to Lahiere's French Restaurant. Everybody will remember that. I don't know who got us started on that, maybe Tucker.

Tucker: Maybe.

Levine: He led us around somewhat. Lahiere's French Restaurant, there on Witherspoon Street.

Tucker: Yes, it's still there, but the prices are much higher.

Levine: My goodness, we paid $5 a week for ten meals then. Well, Bohnenblust was from Switzerland; he could talk French. In that

restaurant he'd always have a friend. They always ate at a small table, and they talked in French all the time. We didn't understand a word they were saying. They were laughing at things, and it kind of irritated us, the rest of us that ate there with him. I never found out who his friend was or what they were talking about.

Tucker: His friend's name was Andre. He was Swiss and worked as a technician in the geology department.

Levine: I didn't know that. [I now recall the name 'Andre'. J.L.] They always ate separately from us, I mean at a little table. The rest of us ate about one table. Thoe who ate at Lahiere's Restaurant were Walker, for sure, myself, maybe Jacobson. There weren't over four or five of us. I don't know if Tucker ate there or not.

Tucker: I ate there for a while, and then John Barnes led a revolt, and we went down to a Greek restaurant farther down Witherspoon Street.

Levine: I remember this place. There was another graduate student, named Cubello.

Tucker: Yes, Frank Cubello, from Niagara Falls.

Levine: Yes, he ate there too, Frank Dominic Cubello. He read the proof sheets of Dean Eisenhart's book. Most of the time he was busy with that. Well, it happened that I was in Princeton about 20 years after I left there. I was curious and went back to Lahiere's Restaurant. Of course the owner is named Mr. Christian. I talked to him, and he seemed to know all the fellows that used to eat there 20 years before. He seemed to remember them all pretty well. I guess we kept him in business, because in those days it was not so easy to get a lot of a business.

Tucker: That's right.

Levine: [J.H.C.] Whitehead became one of the world famous mathematicians. He's the nephew of another Whitehead, even more famous. He was one of Veblen's students. He was from England, and he left after about two years. But he had already been there some years. Barnes was writing a thesis when I came, what we would now call applied mathematics. I got to know him pretty well. He was grading the papers for one of Alonzo Church's classes. He would show me comments Church had written. He would say, "Look at this paper"—Church had written more on it than the student had. Full of comments; Church insisted on that. He was very conscientious, and he told Barnes, "I want you to do the same thing. Just write comments."

Kleene and Rosser came the year after us. They worked with Church in logic.

Tucker: Yes.

Levine: Taub was in the physics department, but he attended all the math classes. He became quite well known in later years. I forgot which school he went to, Wisconsin? No, that was Kleene.

Tucker: Yes. Taub was for a long time at the University of Illinois, where he became head of their computer set-up.

Levine: Flood, I think, went into the testing service.

Tucker: Yes, we have already interviewed Flood.

Levine: Now, the common room. Before Fine Hall was completed we always worked in Palmer Laboratory. There wasn't any place where you could meet or do anything there. There was a small room that served as a math library, and then there was a large room for the physics library. Other than that there were only one or two classrooms, so you never got to see many people. There was nowhere for them to stay, like there was in Fine Hall.

The place we stayed in Fine Hall was the common room. We sort of adopted it as our headquarters, all the students. In fact, they were there almost all the time they weren't otherwise occupied. And they played games: chess, bridge, poker, go, and so on. I liked to play chess. And they really played poker. I heard that there was one game that lasted all night. And the bets were in three digits, dollars not cents. I heard about it the next day. The only two I know were in the game were Bohnenblust and Flood. There must have been some others.

Tucker: I think Robertson was in on it.

Levine: They talked about that for a good long time. They were very much impressed with the magnitude of the game.

Tucker: Dean Eisenhart put a stop to poker after that all-night session.

Levine: Well, there was almost always somebody in the common room from morning till late at night. A few of us would arrive, oh maybe around tea time, 4 o'clock, and just stay there. They just played games. I was curious: when did these people ever study, these graduate students? Of course you could ask that of me too. Naturally if you didn't have to take examinations, you didn't have to study. So some just stayed there and played card games and things like that. However, a good deal of studying was done, especially when starting theses.

Aspray: Did mathematics get done in the common room?

Levine: No, we may have talked a little mathematics, but it was strictly recreation. Of course the visiting professors were there. Everybody would come there at tea time—that was almost the only time the faculty came.

I mentioned Vanderslice. He was one of Veblen's students at that time, and he thought he was an expert chess player. In fact he was somewhat of a chess expert, and I played with him a lot. He really was a good player. A lot of people were interested in chess, and he decided to get up a chess match with the Princeton undergraduate chess club, about ten on each side. He appointed himself number 1 on the team, which was probably right; I was near the end. It so happened the at number-1 board the undergraduates won. It was quite a surprise that Vanderslice lost that game. I hesitated to ask him about it because I think he would be a little embarrassed. But this chess match was quite an event. Our number-2 man was one of the fellowship men—G. Bol, who won his game. I believe the school team won the match.

A lot of us used to spend a good deal of time in Fine Hall, not just in the recreation room—14 or 15 hours a day was not unusual. Vanderslice liked music. He was from Philadelphia, and he knew all about orchestral music. There was a music room in one of the nearby buildings, the name I can't recall. Vanderslice had discovered a phonograph and a lot of records there. Around midnight we'd go up there and play the records. Later somebody complained of the noise, and we had to stop, but while it lasted we enjoyed having these records after a full day's work. I told you about the poker game, and I told you about tea time. That was at 4:00. Professor Veblen organized it, I believe.

Tucker: That's right.

Levine: There was a little kitchen there in Fine Hall. The students who had fellowships were in charge of the tea, making the tea and things like that. I didn't have to do that.

Aspray: How was the library?

Levine: The library was excellent. It was on the third floor. When I wasn't in the common room I was up in the library. Of course teaching was done in different buildings; there were very few classrooms in Fine Hall. I don't believe there were more than two, plus a large lecture room. We were assigned desks in the library for reading and research.

Tucker: That's right.

Levine: We didn't see the faculty very often except around tea time. They stayed in their offices quite a bit. Now, foreign visitors and visiting faculty from other schools. After the Institute got organized and people heard about it, they all started coming to Princeton to stay a year or two. There were what were called National Research Fellows. I don't believe there are any more now. These were people who had just gotten their Ph.D. degrees. They applied for a National Research Fellowship. It was $1000 or $2000, which was extremely high, and they could go to any school they wanted to. A lot of them chose Princeton at that time. Some of them became famous, mathematicians like A.A. Albert, Hassler Whitney, E.J. McShane, McCoy, Leonard Blumenthal.

Those are names I remember. I think they were all National Research Fellows; one or two of them might have been visiting professors, with a leave of absence from another school. We would meet them in the common room; you'd hardly ever see them anywhere else. Of course they did a lot of work. Then there were International Fellows that came from different countries and stayed for a year. I don't remember them, except Charles Ehresmann from France; he became a quite prominent mathematician. Of course J.H.C. Whitehead was already there. Whitehead later became what is called a world-class mathematician. One of the International Fellows was named Bol. He always signed 'G. Bol'. I didn't know his first name.

Tucker: Gerrit, I think.

Levine: Yes, I eventually found this out. He had what I call an interesting recreation: trying to balance the chess pieces. Do you remember that? I don't know how he did it; it seemed impossible. He started with a couple of rooks. He had the 30 other pieces, and he tried to balance them all on the two rooks. I heard that he actually succeeded once and a picture was taken of it. I've never seen it, and I don't know if it's true. One day we were in Eisenhart's class. Bol always stayed in the common room and did this. Eisenhart's class was close to the common room, and once we heard a terribly loud crash from somewhere. Of course the students realized it was one of his towers that fell down, but I don't think Eisenhart knew that. We all laughed about it. Can you imagine that, balancing a whole chess set on two pieces.

I believe E.J. McShane was a National Research Fellow at that time. That was a prestigious award, the most you could get after your Ph.D. McShane was a great practical joker. At that time we were in Palmer Laboratory; we hadn't moved to Fine Hall yet. We usually met in the library room, which was very small. The whole math library was in one small room. Well, late at night he would take out a certain book and put it on the table. There was a secretary who was supposed to put the books back the next morning. Well, this particular book had a very unmathematical title. I'm sure a secretary would be embarrassed reading it. I don't want to mention the title. McShane did that every evening for a while. I wondered what it was, and I finally looked at the book. It was one I had heard of. That was a typical practical joke of his.

Another one. He knew an old English song that you wouldn't want to sing in public, a ballad or something like that. He typed up the song on a secretary's typewriter, making nice clean carbon-copies. He left the carbons on the secretary's desk in the evening. In Palmer Laboratory in the room next to the secretary, he'd give copies to some of the students and they'd start singing the song, loud as they could. I was trying to study then and wondered what was all that noise. Finally I listened for a few moments, and I said, "What are you doing there?" I think Walker and Jacobson were in that group and some others. That was typical of his practical jokes.

When he left Princeton he went, I understand, to the University of Virginia for many years. One of my colleagues here was from there, and I told him about McShane. He knew McShane and just wouldn't believe all the things I told him McShane did. He said he was the most dignified person you ever saw. Well, that was not usual for these fellowship people.

The building of Fine Hall and the founding of the Institute for Advanced Study immediately attracted many from all over the world. In particular some from Germany were invited. Every semester there would be some world-famous mathematician, like Goedel or J.A. Schouten or [Carl Ludwig] Siegel or [Edmund] Landau or Blaschke. Landau was from Germany, as was Weyl of course. Von Neumann and Einstein were members of the Institute. These others were just visiting. Einstein was rarely seen; he stayed in his office. And I have the following incident. Several of us finished eating lunch at Lahiere's one day in the winter. We were waiting to cross Nassau Street, and the bus—I think from New York—came up and stopped. A man got out and said, "How do you get to Fine Hall?" We told him we were going there, so we went together. We asked him what he was doing. It turned out he was painting a picture of Einstein. I think he was going to Einstein's office to check up on it. He was about finished, so he let us in the room. I didn't even know where Einstein's office was then. And we looked at the picture; it was just like an ordinary picture. I don't know what ever happened to that picture. Have you ever heard of that?

Aspray: No, I know nothing of it.

Levine: Well, the people that ate at Lahiere's with me would remember it I guess. It would be interesting to find out where the picture is. It was about an 18-inch by 18-inch, something like that, a picture of his head.

Another incident: when Einstein arrived in Princeton of course all the New York reporters were anxious to interview him. Dean Eisenhart took him around, and he knew that Einstein wouldn't want to talk to reporters. So he managed somehow to go in a little room off the lecture room where the reporters were, and he had Einstein stay in his office. He came back and told I-don't-know-what story to the reporters. This is all hearsay to me. This was when Einstein came to stay, although he had visited Princeton some years earlier.

Now Weyl. I finally got a good office, the last few years. I was in an office with Robert Walker and Richard Brauer. Now Brauer was from Germany, and he was Weyl's assistant. He later became very well known. He went to Canada.

Aspray: Right.

Levine: I was trying to read a lot of German mathematical things, and I always asked him. He was very courteous and helpful. If you're reading something in mathematical German, sometimes you don't know

whether the German says "yes" or "no". It's hard to tell. So he straightened that out. I think he stayed there a year or two. He was very very quiet. I think Weyl helped him get over here.

Now we had a mathematical club meeting every week. The people who gave talks were either the visiting U.S. professors or the foreign professors. Not ordinary students, they wouldn't give any talks. Landau came from Goettingen and was very famous. He was introduced when he arrived; Veblen or Eisenhart introduced him, I can't remember.

He got up and made a memorable remark, which is as follows: "Goettingen was formerly considered the center of the mathematical world. The center of gravity has now moved to Princeton. It is no longer at Goettingen." Now, in the early 1900s anybody who wanted to get a Ph.D. in math had to go to Goettingen almost. I thought that was quite a remarkable statement. I think a lot of us might have been surprised to hear that, because graduate students, you know, had their own problems and didn't bother too much with all these world-class mathematicians. Of course we were glad to see them. So it might have been a surprise to many of us to hear that Princeton was the center of gravity. Maybe it's still thought that way, I don't know. Landau was a very good chess player. I knew about that from Vanderslice.

Well, trying to summarize all this, I'll answer your question if I was happy there. As far as I know, everyone who stayed through four or five years said we happened to be in the right place at the right time. We couldn't have made a better choice of either one. As it said in the song, that was the best old place of all. For us, for me anyway, a mathematical wonderland. All these visitors coming and going. Many gave seminars, and many of them lectured in the evenings, and so on. It was a remarkable time. I think those five years were the best of all. I don't know how the second five came off, but I believe the first five were much better because things were much newer.

Aspray: One question I have concerns the fact that this was the time of the Depression. What effect did that have on your trying to find jobs afterwards?

Levine: That didn't worry us. We didn't think of that so much because we were provided for financially each year, enough to tide us over. Of course we knew there was such a thing. Townspeople knew that. I lived on Bank Street, next to a bank, I believe, and a grocery store. I walked by this grocery store every day. It had sawdust on the floor, an old-fashioned store. I know that people had financial difficulties; everybody knew that.

Aspray: Wasn't it difficult for mathematicians to get jobs?

Levine: It sure was. But I'm talking about while we were students, graduate students. Then it didn't concern us much.

Tucker: Yes, that's right.

Levine: But we knew we had to leave finally, and getting jobs was a big problem. We depended on the faculty to help us. They really did the work, writing letters and things like that. That was quite a serious problem. You usually just grabbed any job you could get, and in 1935 the Depression was about over.

Aspray: How did you get your job?

Levine: Well, someone, one of the faculty members, wrote to a friend who was the head of the department here. This friend said, "We need somebody here." He suggested me. Naturally I wasn't going to turn any job down.

Tucker: Not at that time. And you've been there ever since.

Levine: Yes, except for the war years. Some people had trouble getting jobs; they weren't reappointed. I don't know what they did. Went to other schools. I used to hear them talking about the job business, so there were some that had trouble. Even now, it's not any too easy.

In spring of 1929 Weyl was either a visiting professor or just visiting at Cal Tech. I was a student then at UCLA. Some of the math professors invited me to hear a lecture in the physics department that Weyl was to give at Cal Tech. He was introduced by the then President of Cal Tech (the famous physicist Millikan) as a great physicist. When Weyl got up the first thing he said was to make clear he was a mathematician, not a physicist.