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SHAUN WYLIE

This is an interview of Shaun Wylie on 21 June 1985 at his home in Cambridge, England. The interviewer is Frederik Nebeker.

Nebeker: I'd like to ask you first about your background.

Wylie: Fine. I was born in Oxford, brought up in Oxford. My father was secretary of the Rhodes Trustees in Oxford, so our house was always full of Rhodes Scholars. He was the first secretary and had a very important job instituting Rhodes Scholarships into Oxford University. However, that was well out of the way by the time I was young.

I went to a very good prep school in Oxford called the Dragon School, and I got a scholarship to Winchester College, which is one of the very finest schools in the country. I had a very fine education; I was very privileged.

Nebeker: What was your education directed toward?

Wylie: My father had been a Greats don at Oxford, a philosopher, and he rather hoped I'd turn out to be a classicist. So I kept up the classics, because it was his wish. During my time at Winchester, they were very accommodating: I was the only one who was allowed to do classics and mathematics.

Nebeker: Did you take mathematics throughout your time there?

Wylie: Oh yes, all the mathematics that anyone could ever do. And I did all the classics—towards the end—except composition; I didn't have to do proses or verses, but I did all the translations, and the set-books, and the history. It was very civilized.

Then the question arose as to what I should do about a university. Of course I wasn't going to go to Cambridge. So the question was, what Oxford college I should go to. In those days, they were run in three groups. You could try all groups one after another, and if you failed one you might get into another.

My father had been an undergraduate at Balliol and a don at Brasenose, and there was a strong Winchester connection with New College—there were closed scholarships to New College.

Nebeker: What is a closed scholarship?

Wylie: Only people from Winchester could get these scholarships. The number to be awarded was up to them, but they generally awarded three or four or five, something like that.

I didn't want to go to New College because there were too many from my school there. But my father pointed out that it was in the first of the three groups, and also—a very serious advantage because it was a closed scholarship—New College were perfectly happy to examine me in both classics and in mathematics, my two strong features. Anyway, I went in for that, and I got a closed scholarship.

So I went to New College, and I did mathematics mods. That's the first year's examination in mathematics, which was a bit dull. There was very little in it that I hadn't already done at school. Winchester is one of the places which advances you rather far. For instance, we did Hardy's *Pure Mathematics* at school. So when it came to maths mods there wasn't a lot that was new, and what was new didn't much appeal to me, like hydrodynamics. So I wasn't much taken with the mathematics first year. Doctor Poole was my tutor in mathematics at Oxford.

Anyway, there was sort of a prestige about doing Greats, and I knew enough Latin and Greek to be able to read the texts all right. So I changed to Greats at the end of my first year. I didn't work very hard and didn't do as well as I should; I got a second.

Toward the end of my time, the question naturally arose what I should do when I left. It was suggested to me, I think by Christopher Cox, who was a classical historian, that I might try for a Commonwealth Fellowship, as they were then called. In those times the Commonwealth Board elected two sorts of people. They elected people who'd proven themselves in research, and they elected people on what Henry Whitehead called the ambassadorial ticket, young undergraduates who might do well or might not. I was one of those.

Nebeker: How many years had you completed at Oxford?

Wylie: Three years. So they were taking a chance on me. I always thought that I got elected because my father ran the Rhodes Scholarships and it was a nice gesture to elect me to a Commonwealth Fellowship.

Anyway, I knew well before I finished Greats that mathematics was what I wanted to do, so this was an opportunity to get back. I had to put down a list of three universities I wanted to go to for mathematics. I consulted Henry Whitehead, who was a don at Balliol at the time. He said, "If you want to do mathematics, go to Princeton and read topology. That's the best thing to do." That's what he'd done.

Nebeker: Yes.

Wylie: I put Princeton first and Harvard second. I can't remember who I put third.

Nebeker: Was topology, or analysis situs as it was then called, taught at Oxford at that time?

Wylie: I don't know. I only did one year. Certainly not in that year. When I left the country there were two topologists in England, Max Newman and Henry Whitehead. I don't think Whitehead got the chance to teach much, except possibly to research students, at that time.

So I went to Princeton. I was very lucky to get there. At that time the Institute for Advanced Study was in Fine Hall.

Nebeker: What year was this?

Wylie: 1934 I went. It was an absolute hotbed. Of course that didn't exactly touch me; I knew very little mathematics at the time.

Nebeker: Were you in the Ph.D. program from the beginning?

Wylie: I was, yes. I took an M.A. after my first year. It wasn't certain whether I was to get two years or three. I did bits of research which *could* have been a Ph.D. thesis at the end of my second year, but fortunately I got a Procter Fellowship to give me a third year.

Nebeker: Do you remember any of the classes you took the first year?

Wylie: Oh, yes. Tracy Thomas on differential geometry. Bohnenblust on analysis. There must have been some others, I must have done something on algebra. I think it wasn't Wedderburn, because he was very dry, not very good for the first-year people. It must have been something on matrices and groups. Everyone told us about groups; groups had sort of recently come to the fore. I don't know who it was taught us algebra.

Nebeker: Could I ask you what you remember of Bohnenblust?

Wylie: Yes. I'd heard about Bohnenblust from Henry Whitehead; he thought he was the "coming man" and that one should take an interest in what he did. He was ebullient. He was fun to listen to. You felt, when you heard him lecture, this was the *stuff*, what he was interested in. He communicated enthusiasm in a remarkable way. Lefschetz used to communicate enthusiasm in a quite different way. He got everything

wrong, so the whole class was involved in putting him right. I expect you've heard about that from other people. We were climbing over the chairs trying to get it straight.

Nebeker: I remember hearing about his impatience in going through an argument carefully.

Wylie: [laughing] I don't think he was up to it. No, that can't be right.

Nebeker: He apparently had good mathematical intuition, but not the patience for working something carefully through.

Wylie: Actually, I don't think that's right: I think he was bad at it. I think he rather liked the idea of getting the argument right. He'd tell you the idea, and then he'd screw a chalk into his hand. Then there would, nearly always, be something wrong. We all felt we were involved in the subject because of this. I don't think it was deliberate [laughter]. One thing that was deliberate with Lefschetz, when there were seminars he always asked the most fatuous questions, so that the rest of us would feel that we could ask fatuous questions too. One of the things I learned at Princeton was that the more intelligent you were, the more stupid questions you asked. That was a great comfort to me.

Nebeker: The system there was that you took qualifying exams for the Ph.D. after the first year, wasn't it?

Wylie: Yes, for the M.A. I remember my M.A. examination; it was an oral. The only person who asked me a question that he didn't know I knew the answer to was Knebelman, because I'd been to Tracy Thomas's differential geometry, not Knebelman's, so Knebelman didn't know what to ask me. I didn't do very well on the questions he asked me. I remember Bohnenblus asked me five questions that were in his lectures, and I expect Al Tucker did too. It was just a test to see whether you understood the lectures. There was also a language test.

Nebeker: Did you take the two language tests there?

Wylie: Oh yes, I learned German in order to read van der Waerden.

Nebeker: How did those tests go?

Wylie: All right. Language is something I'm reasonably comfortable with.

Nebeker: It was an oral examination.

Wylie: Yes, I think I had to read a bit and translate it, I can't remember. But I remember taking six lessons in German so I could read van der Waerden and get through this.

Nebeker: Did you take courses the second year?

Wylie: Oh, I took courses all the time. I always took courses, Lefschetz and Tucker particularly. I suspect there were some courses by people from the Institute.

Nebeker: Did you go to any of Weyl's courses?

Wylie: I certainly went to Weyl's, I think he lost me fairly early on.

Nebeker: Do you remember what he was lecturing on?

Wylie: I would guess it was continuous groups, thinking back on it. I don't think I got enough out of it to be very confident what it was.

Nebeker: There are stories of his courses where the attendance would dwindle to two or three because they were so demanding.

Wylie: Too difficult, yes.

Nebeker: How was Weyl as a lecturer?

Wylie: My guess is that he was an absolutely first-rate lecturer. He was extremely clear. I wasn't up to it, that is the thing.

Alexander used to give courses of lectures that stopped after two or three lectures.

Nebeker: Did you attend any of those?

Wylie: Of course. If Alexander gave a lecture course I attended. I remember once he came in with a torus and a few other things and chucked them on the table. He got started on something called gratings, which was an idea of his. He just gave it up after two or three weeks. I don't think he prepared enough, and he wasn't sure he could carry it through. He was past his best then.

Nebeker: What field did you decide to go into?

Wylie: Oh, topology, absolutely.

Nebeker: That was clear from the beginning?

Wylie: Well, you didn't have to know anything else to start topology, and as I didn't know anything else, it was just the job for me. It's not so now. Topology has a great structure of theorems that you have to know—a lot of basic work. In those days you could do it, more or less, with your bare hands. Homology theory had been invented, but I think cohomology theory only came up while I was there. The fundamental group was known about, but Hurewicz' homotopy groups were invented while I was there. It was all happening. There were no exact sequences of theorems as in algebra.

Nebeker: Besides Alexander, who did you learn topology from?

Wylie: Lefschetz and Tucker were the two people for topology. I don't think the other Institute people offered topology. There was Veblen, of course. Now why didn't Veblen give any courses? I don't think he did; I would have gone if he did.

Nebeker: Did you happen to be there when R. L. Moore came to Princeton to give a series of three lectures?

Wylie: If so, I didn't go; I don't remember that. That's the Moore from the Deep South?

Nebeker: Yes, the point-set topologist.

Wylie: It was combinatorial topology that I wanted to do. No, I don't remember R. L. Moore coming.

Nebeker: Who did you work most closely with?

Wylie: Oh, Al Tucker, certainly. I was officially Lefschetz' research pupil, but I was farmed out to Al Tucker. He was the one who helped me. He was the one I used to go to talk to.

Nebeker: What was the topic of your thesis?

Wylie: I started off on a question that in fact I'd raised myself: whether a simplicial complex could have local regularity for all simplexes except those of the penultimate dimension. A very strange thing to ask yourself, but I found that it could happen. That's what I was doing in my second year. In my third year a suggestion was made to me by Lefschetz or Tucker, probably Lefschetz, I am not quite sure. At that time the cohomology theory had started and the cohomology ring had been discovered, the multiplicative structure on the cohomology groups. It was clear to Lefschetz that it must be isomorphic, in the case of a manifold, with the intersection ring, and he put me on to dealing with that. I really did my research on that. Freudenthal published something before I got my results out which established it, but that's what I worked on.

Nebeker: Did you complete your thesis the third year?

Wylie: Just. And I had my Ph.D. examination before I returned. It was a close run thing.

Nebeker: I wanted to ask about the Commonwealth Fellows. You've already mentioned that it was Whitehead who suggested to you going to Princeton. Were there personal connections among these Commonwealth Fellows?

Wylie: Not strong. It wasn't like the personal connections among Rhodes Scholars, because Rhodes Scholars all went to Oxford—in those days, at any rate. We knew about each other; some of us went over on the same boat, and some went on summer trips together. But we weren't greatly aware of being one of a body of thirty. We were held

together by a marvelous man, called Reed, Papa Reed, who used to come around and visit us at our universities. And there was a chap called Whit Littell, too, who came around with him. He was second in command, I think. They would give us dinner and talk to us about how we were getting on, and presumably they talked to our supervisors as to how we were getting on. But it wasn't a very close-knit organization.

Nebeker: I wanted, too, to ask about the image of Princeton mathematics, and why someone would want to come to Princeton to study mathematics?

Wylie: If you're talking about me, the answer is very simple: there was the fellowship. I needed to have something to do the next few years. But I wasn't typical. I was very naive, just an undergraduate. I think that anyone in this country who was a serious mathematician would have known about Princeton. It had this galaxy of people. The Institute and the University were confounded, I think both in people's minds and in practice. Everything happened at Fine Hall. You got the advantage of a tremendous group of people, I should think the top people in mathematics in the world at that time.

Nebeker: Perhaps we could talk a little bit about the physical setting, Fine Hall. Did you often go to the common room in Fine Hall?

Wylie: Constantly. It was a marvelous place. I don't think the staff particularly went there, but the graduate students used to go there and play chess and—what is the name—psychology?

Nebeker: What is that game?

Wylie: Oh, psychology is a very interesting game. A chap called Myers, S. B. Myers, a differential geometer, used to play a lot. Some others, I think Flood, used to play a lot. Each of you would have a suit, the whole suit. You would have spades, say, I would have diamonds, someone else would have hearts. Face down in the middle of the table there would be another suit—you might have needed more than one pack. The suit on the table would have been shuffled and the top card turned face up. Say it was a five. Then each of us would select one card from his own suit and place it face down on the table. They would all be turned up, and the highest would win the five. At the end of the day you counted up the pips of the cards you had won. Well, naturally, you could put out your ace for the five, but it was a bit of a waste. Oh, that was a very serious, very good game.

Nebeker: I've heard of a lot of games played there, but I hadn't heard of that one.

Wylie: Go and chess, of course.

Nebeker: Kriegspiel.

Wylie: Oh, I used to watch some marvelous Kriegspiel games. Yes, a wonderful game. I've introduced it in other places since.

Nebeker: What about the Institute people—Veblen, Weyl, Einstein, von Neumann, Marston Morse. Were they accessible to the graduate students in mathematics?

Wylie: The answer is, I don't know. I never tried. I never thought of them as being inaccessible, if that's any help to you.

Nebeker: You did go to Weyl's lectures.

Wylie: Yes. One year I was actually a member of the Institute. My second year I was a member of the Institute. No distinction was made in my mind between the Institute people and the University people, and of the various people around in the common room, playing games and talking about mathematics, I didn't know who was in what.

It was the talking about mathematics that was good. You would go in for tea or whatever it was, and if you wanted to discuss something there was always someone to discuss it with. People were as ready to talk about mathematics as they were to play chess.

Nebeker: I remember at Wisconsin where I was a graduate student in mathematics that topologists seemed to be those who most enjoyed talking about their mathematics. They seemed to often have interesting topological spaces or properties they enjoyed talking about. Was there any feeling among those of you studying topology that you formed a group distinct from the algebraists, say?

Wylie: I never felt that. Of course the ones I talked to most were topologists, because we were interested in the same things. I don't know whether the algebraists talked to each other or not. Perhaps not, Wedderburn was a very private person.

Nebeker: You had a story about a fellow graduate student who was an algebraist. What was his name?

Wylie: I don't remember his name. He was clearly a nut, an algebraist. The story was that whenever he went for a walk he would have to come back exactly the way he went for fear he would enclose a bad singularity. It's almost certainly untrue, like all these stories.

Yes, I was going to say that I had been to courses by Bochner on complex variables, a single complex variable and several complex variables. An extremely clear lecturer, and I did get a great deal out of his courses. They weren't somehow quite so exciting as Bohnenblust's. I think it was probably a matter of personality rather than of anything else. But they were very fine courses, and I think I probably still have the notes from them, which I've used from time to time.

Nebeker: What about other young mathematicians?

Wylie: Jacobson, Now he was an algebraist. Jacobson and Tompkins I remember with particular affection. When I finally left Princeton I was going to catch a plane to go across to Vancouver, going around the world the other way. Something awful happened. I had a train to catch, and unfortunately I didn't know that you didn't use summer time on your summer train-timetables. When I went to Princeton Junction to catch the train to Newark Airport it had gone. Now there was plenty of time to spare, so I went along to Fine Hall and said, "Who will drive with me to Newark Airport and then drive my car back?" I'd already sold it to the night porter at the Graduate College. Tompkins was there, and he said, "Oh, I'd be happy to do that." And Jacobson said he'd come along "just for the ride." Tompkins said, "Let's go along and ask Polly," that was his wife, "to come." So we went to the flat where the Tompkins lived, and Polly Tompkins said, "Yes, I'd be happy to go, but I'd like to bake this cake first." I began to look at my watch. "It wouldn't take long," she said. We sat there and talked while she baked the cake. Then when the cake came out of the oven, she cut in in four pieces and we ate it. So we got in the car to drive to the airport, and it turned out it was Lincoln's Birthday or Washington's Memorial or Labor Day or something and the whole road was absolutely stiff with cars. I drove most of the way up on the soft shoulder, you know, and got there—in my opinion—with about two minutes to spare. Then it turned out the airports *do* use summer time; I had assumed the airports would be made like the railway stations.

Anyway, I have great affection for Jacobson. I remember also one day I decided to drive out to Asbury Park just for the ride, and Jacobson wanted to come along. Do you know Asbury Park?

Nebeker: No, I don't.

Wylie: It's not quite like Atlantic City, but it's a bit like it, fun fairs and that sort of thing. And we went on the bumpums. Poor Jacobson had a bumpum all to himself, and he was wearing his Phi Beta Kappa key. Poor Jacobson was a target for all the roughs in the town; they had a lone Phi Beta Kappa in a bumpum and they weren't going to waste the opportunity.

Nebeker: I wanted to ask how it was living at the Graduate College.

Wylie: It was a marvelous place for me. I was very young. I'd lived in college. I didn't have to bother with meals, nor to find my own accommodations. It was a corporate life to which I was used. You met a lot of people who weren't doing mathematics.

Nebeker: Did *you* get to know people outside of mathematics?

Wylie: Oh, yes. There were a couple of chemists I got to know quite well. There was Larry Levengood, who was a professor of modern languages and who had people for cocoa in the evening. I remember at least one English student. Oh, and the English student I traveled around America with was at the Graduate College, a chap called Frank Lyell. We spent the summer together.

Nebeker: So you didn't return to England for the summer months?

Wylie: In the first summer-month it's part of your job as a Commonwealth Fellow to travel around the States. You got paid for it: I haven't been through all the States, but most of them. That was a terrific experience.

Nebeker: Did the English graduate students associate with one another to a considerable degree?

Wylie: Yes, they did. For one thing, we were more frivolous than the other graduate students. We were regarded as people who obviously weren't working hard. You may have read in the book about Alan Turing by Andrew Hodges about our treasure hunts and hockey games and that sort of thing.

Nebeker: Could I get your account of how field hockey started at Princeton?

Wylie: It didn't start with us. There was a man named Wolfenden, in fact there were two people named Wolfenden in the Graduate College. One of them was a very great hockey player, but the other started hockey at the Graduate College. When we were there, a friend of mine called Francis Price discovered that down in the basement there were a number of field-hockey sticks. He and I had played hockey for New College together when we were up. So he collected these, and we marked out an area at the back for field hockey. We may have had twenty or thirty people who played, most of the English community and many Americans and Canadians. We used to play games; we played Miss Fine's School—I don't know if that's still going in Princeton. And we had a match against Vassar.

Nebeker: Could I hear about that match against Vassar? It was mentioned in another interview.

Wylie: Oh, it was rather a flop actually. We drove over, and it rained, so we played in a gymnasium.

Nebeker: Now this was a men's team from Princeton playing the women's team from Vassar.

Wylie: An inexpert men's team playing a comparatively expert women's team, but men move so much faster, so that although we didn't have as much control we were better. We played some school in Philadelphia, I think, and there was a men's team in New York who came down to play us—only just beat us.

Nebeker: I know that James Alexander was quite a sportsman, a tennis player and an expert mountain-climber. How many of the graduate students were active in sports?

Wylie: There were a lot of very good tennis players in the Graduate College. A chap called Chabauty, who was, I think, on the French

Davis Cup team, though perhaps never played for France. There was a handball court in the basement of the Graduate College that people used, and I think quite a number played squash. There was softball in the evenings in the summer, which was played fairly seriously. But I don't think there were many graduate students who spent much time on sport.

Nebeker: You said that the English students saw themselves as somewhat frivolous.

Wylie: We were seen by the *Americans* as frivolous [laughter].

Nebeker: How did Princeton seem to someone coming from Oxford or Cambridge? What was their impression of it as a university?

Wylie: I can say only what my impression of it was. I was very sorry that the Graduate College was separate from the University. I would have liked to have had opportunities to get to know undergraduates as well as graduate students. But the Graduate College itself was only too blatantly based on an Oxbridge college. It was really just like what I was used to, extremely easy to slip into.

Nebeker: What about the instruction in mathematics or whatever?

Wylie: I can only talk about the graduate instruction. I thought the instruction in the graduate courses was extremely good. What I liked, which was new to me, was that there were nearly always a couple of people told to take notes, and the notes were published monthly, in arrears.

Nebeker: Was this done in most of the graduate courses?

Wylie: Almost all, I would say. A great many, at any rate. I think it was very good for the people who took the notes, too.

Nebeker: Were the notes looked at by the professor before they were run off?

Wylie: I don't know, I never was involved in the note-taking. I would guess they were. The only person who didn't lecture clearly—and that was the person I learned most from—was Lefschetz. Wedderburn was dull; Church—I think I tried Church for a bit—was unbelievably slow. I never went to Knebelman's lectures, I don't know why not. Nor did I go to Robertson's, since I wasn't interested in theoretical physics.

Nebeker: Did you have contact with von Neumann?

Wylie: No, I heard him only a couple of times. There was a mathematics club, and I remember he gave a talk about some relationship between the indeterminacy principle and logic, which I found fascinating and forgot instantly [laughter].

Nebeker: I know that later on you were a close associate of Alan Turing. Did you know him at Princeton?

Wylie: Yes, it was his first of two years and my last of three. By the time he came, there was a fairly well established clique, I have to say, of friends. A lot of English, and quite a number of Americans—Will Jones was one, and Bobby Burrell and Wendell Taylor to a lesser extent. We did things together, had play readings and that sort of thing. Well, that wasn't really Alan Turing's scene. He was an honorary member of the clique. He hardly seemed to throw himself into things. I suspect that he was glad to be involved, but was certainly at that stage not a leading spirit. Charlie Stacey, a historian, was another one who did things with us. Carl Allendoerfer, too; he was at New College with Will Jones, and Francis Price, and me. But perhaps he didn't take part in some of the sillier things we did.

Nebeker: You mentioned that, although Solomon Lefschetz was officially your thesis adviser, you worked most closely with Albert Tucker.

Wylie: That's right, he was the one who really helped me. He used to think about my problems when I wasn't there and come up with suggestions. He came up with an absolutely crucial suggestion in the first bit of work that I did, on simplicial complexes. All along I felt he had thought about what I was doing, whereas I think most research supervisors would just do it as well as they could when the chap came. He put a problem my way which I was able to solve, and altogether he was the person on whom I leant. The thing that most fascinated me when I saw him with great pleasure a couple of years ago was the extent to which he'd changed. When he was helping me with my research, there used to be enormous silences after I said something, while he was thinking about what I'd said, though heaven knows why anything I'd said could provoke a silence like that. While he was thinking about what I'd said there would be no indication, from his face or otherwise, that anything was going on inside. About the time I'd given up he would come out with some very useful remark. When I saw him a couple of years ago, he was all talk and there was nothing in the way of silences—perhaps I didn't say anything that was worth stopping for [laughter].

Certainly I regard him as having been my research supervisor, although Lefschetz did propose a problem to me and occasionally had something to say about ways in which one might go about solving it. But Tucker was the one I went to whenever I was in difficulty, and I never came away without some help.

Nebeker: Did you take classes from Tucker?

Wylie: Yes, I did. I think there may have been one about Lie groups, but I can't be sure. I would certainly have gone to any class that he gave. I went to all the topology classes that were given.

Nebeker: One thing that several people have mentioned about Princeton in those years is that it was easy for a graduate student to be

distracted by all that was going on, that it was easy to have one's attention drawn to a wide variety of mathematical topics, when, of course, one's main concern was getting on with the thesis research.

Wylie: Yes, in fact that suited me down to the ground, because I was very ignorant and could learn a lot from anything that was going on. I don't think the courses outside topology that I went to were a repetition of anything that I knew. Indeed, I was asked, in a couple of courses, to give an exposition. It was a very useful broadening of my knowledge of mathematics that I've been grateful for ever since. I haven't done original work in anything other than topology, but it extended my grasp—such as it is—of mathematics as a whole. And it didn't distract me.

Nebeker: I remember someone else saying that he was asked by Weyl to give a presentation. How common was this?

Wylie: Not uncommon. I think it was a very good feature. I did try it myself when I was lecturing on Part 3, which is rather like graduate work. I had some very good people, and I got some fairly reasonable presentations. I gave it up. I think I supposed that it took too much time; I had a syllabus to cover.

I did one presentation in Tracy Thomas' course and one in some algebraic geometry lectures—I've forgotten who was giving them. And I know that Al Tucker had us all explain things, one after the other. I really learned something in doing these presentations.

Nebeker: What do you remember of Tracy Thomas?

Wylie: He smoked a cigar. That's what I remember. My first year I went to him on differential geometry. I didn't know anything about differential equations, and he was talking about—I now realize—integrability conditions, but he was a Texan, so it came out "angrabillady conditions". I had no idea what they were. I think his lectures on differential geometry were good lectures; I wasn't quite sophisticated enough to know. But they were much enlivened by the presence of S. B. Myers, I think the name was, a postdoctoral fellow who commented on them. Not in an obtrusive way, in a very helpful way.

I remember Tracy Thomas invited us all one evening round for drinks. Very kind of him, but he never seemed to me a very approachable man. But I can't say, because I wasn't really interested in his subject.

Nebeker: What about the social life among the mathematicians? Some people have mentioned tea at the Eisenharts' or parties given by the von Neumanns.

Wylie: The Weyls gave parties occasionally. Turkish coffee. I don't think there were a great many parties, and the Eisenharts entertained for all graduate students, not just those in mathematics. The Weyls

entertained most often. They had two sons about our age, I don't remember their names.

Nebeker: Michael and Joachim.

Wylie: Yes, a lively pair. We played games and had rather a nice time. Weyl had a very beautiful wife.

Nebeker: Was this because you were taking a class of his?

Wylie: I don't know why. Maybe he just invited graduate students. I did take a class of his.

Nebeker: How did you relate to Weyl?

Wylie: I didn't get much out of his class, but I enjoyed his company. He was a pleasant and genial man, but I was way outside his sphere, and I wasn't a student of his. Nor did I see much of von Neumann for similar reasons.

Nebeker: I understand that Einstein lectured very little, and worked mainly with his assistants.

Wylie: He smiled genially when he met you in the park. He was good at that. [laughter]. I don't think he came to the common room much.

Nebeker: Yes, I think I've heard that from others.

Wylie: Lefschetz came, I think, quite a bit. Also Tucker, Bohnenblust—the younger ones.

Nebeker: The graduate courses in mathematics, I understand they didn't have final examinations, perhaps no examinations at all.

Wylie: There were no examinations except the oral for the M.A. and the oral for the Ph.D.

Nebeker: But I assume there were problem sets in these classes.

Wylie: Not that I remember. I think I'd have done them; that's the sort of thing I liked.

Nebeker: I meant to ask you about your oral exam for the Ph.D. Do you remember that? Who was on your committee?

Wylie: Lefschetz, Tucker. Tucker told me ahead of time (perhaps I shouldn't say this) the sorts of thing I'd be likely to be asked, then he asked them [laughter]. Bochner was on my committee, and he asked me a very difficult question about the relation between almost-periodic functions and dual groups. The duality between compact groups and discrete groups. I didn't catch on to it at all. Mostly I was asked easy questions, and I was allowed to say what I'd done in my thesis and the methods that I had used. There were follow-up questions. I think Bochner was the only one who introduced new material.

When you do Ph.D. examinations in this country you ask about the thesis and you ask a few courtesy questions about supporting mathematics. I don't know if that's common in the States. Nobody pays too much attention to them.

Eisenhart was there. I can't remember who else.

Nebeker: Was Eisenhart there because he was chairman of the department?

Wylie: If he was chairman of the department it wouldn't have impinged on me. I think I probably did go to one of his courses of lectures. He was Dean of the Graduate School; that's how I had most contact with him and his daughters and son.

Nebeker: He must have been living at Wyman House, right at the Graduate College.

Wylie: I think that's right. He was a very nice man, and that was a very attractive family. They used to ask us round. You'd feel welcome. She was rather splendid and perhaps a little grand, and he was perhaps splendid and not at all grand. They made a very good couple at entertaining. And of course he dined in the Graduate College quite often.

Nebeker: Was it the practice then to wear gowns to dinner?

Wylie: Oh yes, gowns to dinner. Certainly.

Nebeker: That was, I imagine, something smiled at by the graduate students.

Wylie: Perhaps it was; to me it seemed absolutely natural. Don't you wear a gown to dinner? I expect it did seem bizarre to the natives.

Nebeker: Was there a good relationship between the students living at the Graduate College and the University staff?

Wylie: There were various members of the faculty—Gillespie, Larry Levengood, Charlie Stacey, Wendell Taylor (I think he was on the faculty, I'm not sure)—who lived at the Graduate College and were friends with us. It was very nice.

Nebeker: If you were to describe the social world of the University, would you say there was a greater distinction between the undergraduates and the graduate students than between the graduate students and the faculty members?

Wylie: That's an interesting question. It seemed to me there was a total split between undergraduates and graduates. We weren't involved in the same sort of things. I don't believe that undergraduates even came into Fine Hall.

Nebeker: Yes, undergraduate instruction was elsewhere, and I've heard that they needed some special reason to use the library in Fine Hall.

Wylie: I used to meet undergraduates in two ways. First, I played rugby football, in which graduate students were allowed to play. Secondly, the Dean of the Chapel, Dean Wicks, a lovely man who had a marvelous family, used to invite people out on Sunday evening to play ping-pong—table tennis, sorry—and generally spend the evening and eat waffles. There were some graduate students; quite a number of the British were asked out. And some undergraduates used to come too. Two of the sons were undergraduates at that time. But otherwise I didn't come across undergraduates very much. So there was a big split between the graduate students and the undergraduates.

Between the graduate students and the faculty, no, I didn't feel there was a split at all. But there wasn't a tremendous amount of hobnobbing either.

Nebeker: I suppose there was a sort of continuum from graduate students to people who were teaching a section or two to instructors to assistant professors.

Wylie: I was amazed to discover that Ralph Traber, who was a friend of mine, was a research assistant. I thought he was just a graduate student like me. Part-time instructors, I think I was aware that they did part-time instruct. Walker, for instance, gave a course that I went to. But I quite agree: there was a pretty continuous flow between these.

Nebeker: You didn't do any teaching, since you had the fellowship.

Wylie: Oh no.

Nebeker: Did you use the library in Fine Hall?

Wylie: What I used were the four seminar rooms off the corners of the library. Very good places; you nearly always got it to yourself. I liked to draw on the blackboard.

Nebeker: To work through material?

Wylie: Just to think about things, and to talk to people occasionally. It's one of my failings that I'm not a library person. I don't read books easily. I hate reading mathematics; I'd rather hear about it. So, no, I didn't use the library a lot though it was a good one.

Nebeker: Another of the facilities of Fine Hall was the showers down on the first floor.

Wylie: There weren't showers, were there?

Nebeker: Yes.

Wylie: I knew that down there was some terrible machine which cyclostyled notes—a printing facility of some sort.