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ALONZO CHURCH

Alonzo Church is interviewed by William Aspray on 17 May 1984 at the University of California at Los Angeles.

Aspray: Could we begin by your describing how you came to Princeton and what caused your interest in Princeton?

Church: I was an undergraduate at Princeton, and I was pressed by the math department to go on to graduate school. Actually they gave me fellowships that paid my way, otherwise I would not have been able to continue.

Aspray: Who was it on the faculty that was encouraging you to go on to graduate school?

Church: Primarily Oswald Veblen, also to some extent Dean [Henry Burchard] Fine and Luther Eisenhart.

Aspray: What years were you a grad student?

Church: I graduated in 1924, as an undergraduate that is, and then immediately went to graduate school and got my degree in 1927.

Aspray: After finishing graduate school did you immediately become an instructor in the department or did you go off some place?

Church: I had two years on a National Research Fellowship. I spent a year at Harvard and a year in Europe, half the year at Goettingen, because [David] Hilbert was there at the time, and half the year in Amsterdam, because I was interested in [L.E.J.] Brouwer's work, as were some of those advising me.

Aspray: Brouwer was there at the time?

Church: Yes. I think he wasn't teaching. He was quite old. I used to take the train out to his residence, way out in the country.

Aspray: Who of Brouwer's group of disciples, whatever you want to call them, were there while you were there?

Church: [Arend] Heyting was not there, and I remember no one except Brouwer himself. He had a secretary who was also a student, but she was not interested in foundations.

Aspray: How did you get interested in foundations?

Church: Well, mainly through Veblen, who was not himself a contributor to foundations in math except in the old-fashioned sense of postulate theory.

Aspray: Geometry and postulate theory?

Church: Yes. His dissertation was about axioms for Euclidean geometry. He did over again what Hilbert had done, so of course it was not wholly original, but I always thought his axioms for geometry were on the whole somewhat better than Hilbert's. Of course Hilbert had prestige and he didn't.

Aspray: At least three other people that I've interviewed have said that. Your interest in logic, did it come as an undergraduate or a graduate student?

Church: I was generally interested in things of a fundamental nature. As an undergraduate I even published a minor paper about the Lorentz transformation, the foundation of (special) relativity theory. It was partly through this general interest and partly through Veblen, who was still interested in the informal study of foundations of mathematics. It was Veblen who urged me to study Hilbert's work on the plea, which may or may not have been fully correct, that he himself did not understand it and he wished me to explain it to him.

At any rate, I tried reading Hilbert. Only his papers published in mathematical periodicals were available at the time. Anybody who has tried those knows they are very hard reading. I did not read as much of them as I should have, but at least I got started that way. Veblen was interested in the independence of the axiom of choice, and my dissertation was about that. It investigated the consequences of studying the second number class under each of two assumptions that contradict the axiom of choice.

Aspray: Was there any opposition on the part of the rest of the department to a graduate student doing a dissertation in logic?

Church: Well it was not exactly a dissertation in logic, at least not the kind of logic you would find in [Whitehead and Russell's] *Principia Mathematica* for instance. It looked more like mathematics; no formalized language was used. The only thing that might have annoyed

some mathematicians was the presumption of assuming that maybe the axiom of choice could fail, and that we should look into contrary assumptions.

**Aspray:** That suggests that if you wanted to do something along the lines of *Principia Mathematica* you would have had some trouble in the mathematics department doing it.

**Church:** Quite possibly. I did later try that. I published a paper with serious errors, and generally got in bad because I was hasty and incautious.

**Aspray:** Can you tell me something about your graduate education, the kinds of things you studied, the people you studied with.

**Church:** I had an interest in foundational questions, but there were not many courses in that direction. I took essentially the standard curriculum. I could not name all the courses I took, but there was, of course, a general examination to pass, and there were various required subjects including analysis and real-number theory. I forget exactly what else, but I think I still have something listing the courses I took with the signatures of the instructors.

**Aspray:** You presumably took courses with Eisenhart, Fine, and Veblen.

**Church:** Yes, and [Einar] Hille and [J.H.M.] Wedderburn. I can't name the exact courses now, but I remember several courses in analysis. James Alexander had a course in topology. He appointed me to take lecture notes. This is something I have somewhere. He spent about half the course on the solution of the problem of classifying closed two-dimensional manifolds. This was done in a highly geometric way, which has much more appeal than the present topology, which consists mainly of incidence tables and something that looks so much like algebra you can't tell the difference unless you go into detail.

I wrote a very careful set of notes on the first half of the course which was on just this problem of classifying closed two-dimensional manifolds. They are around somewhere. There is nothing original in them, but I think they are a careful job of reproducing Alexander's lectures. Sad to say I never got the second half finished. Somehow or other he forgave me for not doing it, probably because he had to, but by the end of the course I had just finished the notes on the first half.

**Aspray:** Was it standard for grad students to be asked to take lecture notes at that time? I know it was in the '30s.

**Church:** I assume it was. I don't know for sure, but I did it for Alexander's lectures, and it may be that is the best record of what he was doing at the time. I have not looked into his publications.

Aspray: What do you remember of the various faculty members as teachers at the time you were a grad student? Does anybody stand out one way or another?

Church: Veblen perhaps. I think it was because of his interest in foundational questions that he impressed me. Fine was excellent for teaching undergraduates, especially for the better sort of undergrads who had some idea of what was going on and were not just grinding away at it. He had not done any research since he got his degree, and he did not try to teach any graduate courses, but I had many courses with him as an undergraduate. I thought well of almost everyone who was teaching there at the time. Who were the others? Eisenhart, Wedderburn, and of course Alexander.

Aspray: [Tracy] Thomas came later, is that right?

Church: Yes. He was essentially a contemporary of mine, I think. He got his degree four years before I did.

Aspray: Didn't Einar Hille come sometime while you were a student?

Church: Yes, I don't remember whether he was there when I entered the graduate school or whether he came later.

Aspray: Who were some of your fellow graduate students?

Church: Paul Smith. I remember him as being a graduate student at the same time I was. There are no doubt a couple of others about whom I would say, "Of course I remember a lot about him" when the name came to mind.

Aspray: How closely did you work with Veblen on your own research?

Church: He was really the only man supervising it. I sort of had to convince him about some aspects of the axiom of choice. To deny what seems intuitively natural is rather difficult. You tend to slip back into what informally seems more reasonable. I remember from time to time having to explain things to him, but I convinced him that my arguments were sound.

Aspray: Do you remember who else was on the committee that read your thesis and examined you?

Church: Certainly Veblen, quite likely Eisenhart and Alexander, but I have forgotten.

Aspray: Several people have suggested that Veblen encouraged grad students and visitors and young faculty members to really push their research and not put as much effort into their teaching. How would you react to that?

Church: Well, I don't remember his being negative toward teaching. Of course he did try to get people interested in research, but that is probably not unusual.

Aspray: Though Princeton was a special place at that time.

Church: It had preeminence specifically in math. There were complaints that the University was overemphasizing this one field to the detriment of others.

Aspray: I see, mainly because the University was thought of primarily as an undergraduate institution.

Church: It had been for a long time. The University was developing the grad school. I wasn't one to complain, but there probably was a one-sided emphasis on math because they happened to be able to get a lot of good people in that particular field. My impression at the time was that for teaching grad students there were abler men in mathematics than there were in other departments. That tended to produce an emphasis on math. You can't be preeminent in all fields, so there is something to be said for being preeminent in one.

Aspray: I know that there are certain external ways of judging which do seem to indicate that math was preeminent. For example, there were certain competitive fellowships that seemed to always go to the math department. One—I can't recall the name now—for people coming from Cambridge each year.

Church: Yes. I remember the fellowships that I had, but I don't know whether they were confined to mathematicians or whether they were general fellowships. I probably did not notice very much.

Aspray: Did you do any teaching while you were a grad student?

Church: I think not. I got an appointment as an assistant professor immediately after my two years on a fellowship. I think that was the first teaching I did.

Aspray: Did you think of going some place other than Princeton after your two years?

Church: I think nobody made me an offer, and I did not go hunting for offers because I saw no reason to leave Princeton. [Afterthought: Belatedly I remember an offer from John Hopkins, but I had already accepted at Princeton.]

Aspray: Do you remember much about your teaching responsibilities in your early years as an assistant professor?

Church: I may well have been teaching things like elementary calculus, more or less according to the routine. There would be a large group of students taking their first or second course in calculus, 100 to 200 I suppose. They were divided up into sections of ten originally—the number kept growing. There was one man in charge who coordinated things. There was a complicated method of judging the examinations so as to try to make the grading uniform and at the same time have input from the instructors. I remember sitting through sessions where the

grades given to the students in different sections were compared and adjusted by artificial formulas.

Aspray: Did you get a chance to teach any grad courses?

Church: I can't remember when I started teaching grad courses. Rather early I started teaching grad courses in mathematical logic. There was no one else there to do it.

Aspray: What sort of things would you cover in those courses? What would you use as material?

Church: Yes. I gave first an elementary course in mathematical logic. I forget what textbooks I used at first. I worked as rapidly as possible to get at least something of my own written out. My research was unorthodox and some of it unsound, but I was devoted to it and wanted to get my own ideas down and teach them.

Aspray: I am trying to remember what textbooks were available in the late '20s and early '30s. Do you recall?

Church: There were none that I liked. Lewis and Langford's *Symbolic Logic* was around. No, that may have been later, but certainly the book by C.I. Lewis was available. But there was nothing about the sort of thing I wanted to teach, logic directed towards math rather than the philosophical aspects of logic. Well, I am not sure; there may have been a book of that sort. Of course [David] Hilbert and Wilhelm Ackermann's *Grundzuege der theoretischen Logik* was in existence at that time, but it was in German. While the grad students were supposed to learn German, as a practical matter I could not have used it as a textbook. So I used written notes of my own and things like that. [A later check shows the Lewis's *A Survey of Symbolic Logic* was published in 1918, and Lewis and Langford's *Symbolic Logic* was published in 1932. A.C.]

Aspray: Was there any relationship between the math department and the philosophy department at this time?

Church: No. Nobody in philosophy was interested in that sort of thing at the time.

Aspray: When did an interest in logic develop among philosophers?

Church: That is hard to say. Of course, C.I. Lewis' *A Survey of Symbolic Logic* was published sometime between 1910-1920, and it is very definitely philosophically oriented. So there were philosophers who were interested in symbolic logic from the point of view of its relevance to philosophy rather than to math, and Lewis was one of the leaders in this. He was at Harvard at the time.

Aspray: While we are on the subject, can we talk more about the logic community in the late '20s and '30s, both in the US and overseas? Where were the active centers? Did you have any contact with these people?

Church: I had very little contact with the people at Harvard, where I suppose the logicians were C.I. Lewis and H.M. Sheffer. Those are the ones I remember.

Aspray: Was anyone at Chicago at that time?

Church: Not that I remember. There must have been some other logicians, but the others who were active at that date or earlier were, I think, mathematicians. E.L. Post, for instance, was a mathematician. He did write papers criticizing some of Lewis' work. In fact, Lewis' first set of axioms for his modal logic had a serious error that Post corrected, and then Lewis tried a second time.

Aspray: Did you have close ties with Post?

Church: No. He was at Princeton just before I was. He may have been there at the time I was an undergraduate, but I did not meet him till much later. He had some sort of mental trouble and was inactive for a long time. He finally recovered from it, and that was really when I first heard of him or heard from him.

Aspray: What about in Europe? Were these people you were in contact with? Did you keep up a contact with Brouwer, for example?

Church: Yes, to some extent. To a greater extent with Bernays, who, because Hilbert was old and ill at the time, was the main logician at Goettingen when I was there.

Aspray: Ackermann?

Church: No, Ackermann was not there at the time I was there. He never had a university position, if my information is correct. He had a degree from Hilbert, but that was before I was in Goettingen. Where he was in Germany at that time, I do not know, but much later he was teaching at a *Gymnasium*. He never did really have a university position, though he finally received an honorary professorship at Munich.

Aspray: What about people like Skolem, did you have contacts with Skolem?

Church: Not till very much later.

Aspray: Do you know anything about the discussion there was to bring you back to Princeton as an assistant professor? Maybe you heard this many years later?

Church: I was not let in on their deliberations. I assume it was Veblen's idea, though it is merely an inference. All I really know is that I got an offer while I was still a fellow at Goettingen, I accepted the offer, and I ceased to look after that.



Aspray: As you progressed up the ranks at Princeton, did Veblen continue to be a strong supporter of your moving up? You obviously had to have your own talent to continue to move up.

Church: I assume he was until he resigned at Princeton and joined the Institute. I forget the date of that. It was probably before 1930, but the dates are on record and you can easily check it.

Aspray: '30-'31.

Church: I see.

Aspray: Why don't we turn to your graduate students for awhile. If I remember correctly you had Alfred Foster, Stephen Kleene, and John Barkley Rosser. Did you have other students in the '30s?

Church: None that I remember now. There may have been some, but none of note. There was a gap there until later when Leon Henkin and John Kemeny were there at the same time. There were also Hartley Rogers, Martin Davis, Norman Shapiro, William W. Boone, and (much later) D.J. Collins. My memory is very poor, both as to the names and as to the chronological order, but most of these were later than the '30s.

Aspray: Can you tell me something about these graduate students? Anecdotes, personal stories, things you remember about their research, how they got involved in logic—anything along these lines?

Church: I remember Kleene was slow getting started. It is possible he was trying other fields, but as far as I knew he did almost nothing for quite a time. Then suddenly he began to come up with things that impressed me greatly.

Aspray: Now did all three of them start by working on the same sorts of things you were working on, such as the lambda calculus?

Church: Kleene and Barkley Rosser were there simultaneously, and both started work in connection with recursive functions and the lambda calculus at about the same time. The notion of a general recursive function originated with Goedel in lectures at Princeton.

Aspray: How closely did they work with you on projects? Did you suggest problems to them? Did you talk to them regularly?

Church: I did talk with them in a general way, and they took courses in which I was teaching things such as the lambda calculus. Probably in both cases they worked considerably alone before they came to me. I don't remember details now, especially not the chronology, but I remember being quite surprised when they first brought their results to me.

Aspray: I know Rosser quite well because I studied with him when I was a grad student, but I don't know Foster at all. I'll get to meet him.

Church: I didn't think much of him at the time. He has developed since, and I believe he is very well thought of. His field, though, is not exactly logic. He is at Berkeley now as you probably know.

Aspray: I'll see him tomorrow. Did you have many grad students taking your courses in logic?

Church: At one time I did. There was a time when logic was not very well thought of, and the students tended to follow the trend.

Aspray: Can you elaborate on that? I have always thought that was true, but I was not sure.

Church: There is nothing definite that I can put my finger on. I speak of an impression.

Aspray: What period was this?

Church: Oh, the late '30s. Just before the *Journal of Symbolic Logic* began and for a time after that.

Aspray: Now, as the Institute got started, actually even a little before that in the case of von Neumann, you got other people coming into the community who were interested in logic.

Church: Well, as far as I know, at the time when von Neumann came to Princeton his interest was set theory rather than logic. Even that was in the past as he had already turned to other subjects, either that or he did so very soon after he came.

Aspray: You did not have very much contact with him then?

Church: Not too much. Occasionally there would be a question or a paper in set theory I would consult him about; and occasionally he would consult me. This is how I got the impression that he was no longer active in set theory, but was doing something entirely different.

Aspray: Was it not 1933 or 1934 that Goedel came to Princeton?

Church: Yes, that may be right.

Aspray: Did you have close contacts with Goedel then?

Church: I had a lot of conversations with him and a lot of disagreements. Like most others, I was hard to convince about the incompleteness theorem. There was at the time a tendency, which I shared, to think that it was special to a certain type of formalization of logic and that a radical reformalization might have the effect that the Goedel argument did not apply. I persisted in that longer than I should have, and he was always trying to convince me otherwise.

Aspray: I see. Was the lambda calculus one of those that you would have put into that category of being radical enough that the incompleteness theorem would not apply?

Church: Not the lambda calculus alone. In a way that does escape the Goedel theorem, but it does it not by not being powerful enough. I had a scheme that had the lambda calculus as part of it. After publishing a couple of attempts that actually lead to inconsistency, I decided that it couldn't be put through, so the lambda calculus is all that is left of that. The sense in which it escapes the Goedel theorem is not significant from the point of view of logic as a foundation of mathematics, though it might be in other directions.

Aspray: Who else came as a visitor or as a member of the Institute or as a university faculty member in the '30s?

Church: Bernays was there on two successive occasions, each time on one-year appointments. I think it was at Princeton University, rather than the Institute. I had a lot of contact with him at the time.

Aspray: Anyone else?

Church: No, I can think of no one else.

Aspray: You said that Henkin and Kemeny were students at the same time?

Church: Yes.

Aspray: This must have been '39, '40, something like that, is that right?

Church: There was a gap between the students that was important enough for me to remember, that is between Kleene and Rosser and the next two to fall into that category, Henkin and Kemeny.

Aspray: Did they both work with you?

Church: Well, Henkin had a new proof of the Goedel completeness theorem and an extension of it to second-order logic. This was quite substantial. Kemeny's dissertation concerned the relative strength of simple type theory and ZF set theory without replacement axiom. He wrote a dissertation which I thought well of, but he did not accomplish very much in research afterwards.

Aspray: Did you direct Alan Turing's thesis?

Church: Well, he was at Princeton, but not only under my supervision, because, of course, he had worked with M.H.A. Newman in England. It was while he was working with Newman that his truly original ideas came out.

Aspray: On effectively computable functions?

Church: Yes. In fact the definitions of effective calculability and the results on the unsolvable decision problems are essentially the same. These were obtained by me and by Turing almost simultaneously. I

think I was the earlier by six months or a year. My paper was delayed in publication, but there is an earlier abstract. Turing did not hear of it until it finally appeared. It was, of course, a great disappointment to him. I don't know the date at which he first had the result.

**Aspray:** If you don't mind, I would like to ask a few more questions about this topic, because it is one of particular interest to me since I wrote my dissertation on Turing. How did you hear about Turing's work?

**Church:** Well, Turing heard about mine by seeing the published paper in the *American Journal of Mathematics*. At the time his own work was substantially ready for publication. It may already have been ready for publication. At any rate he arranged with a British periodical to get it published rapidly, and about six months later his paper appeared. At the same time, I think, Newman in England wrote to me about it.

**Aspray:** Now didn't his papers appear in the *Journal of Symbolic Logic*?

**Church:** No, I guess there wasn't any such journal at that time. It appeared in a British journal.

**Aspray:** *Proceedings of the London Mathematical Society*.

**Church:** It is quite likely, yes.

**Aspray:** That is where it was. Did you know Newman at the time?

**Church:** Only by correspondence.

**Aspray:** How was Turing's visit to Princeton arranged?

**Church:** At Newman's suggestion he applied for admission as a grad student.

**Aspray:** I thought that he had come on a one-year fellowship and then was encouraged to stay on by Dean Eisenhart for a second year as a regular grad student.

**Church:** Yes, I forgot about him when I was speaking about my own graduate students. Truth is, he was not really mine. He came to Princeton as a grad student and wrote his dissertation there. This was his paper about ordinal logics.

**Aspray:** Right. Did you have much contact with him while he was writing his paper?

**Church:** I had a lot of contact with him. I discussed his dissertation with him rather carefully.

**Aspray:** Can you tell me something about his personality?

**Church:** I did not have enough contact with him to know. He had the reputation of being a loner and rather odd.

**Aspray:** Could you tell me something about the founding of the *Journal of Symbolic Logic*? For example, what was behind your decision to found a new journal?

**Church:** It was not my doing. Somewhere there is an historical paper about this in the journal itself.

**Aspray:** I can find that easily. I was not aware of it.

**Church:** Yes, it is a historical paper about the founding of the Association for Symbolic Logic and of the journal. I was not in on it from the beginning. I was brought in as editor for the journal later. I think the information in that paper is more accurate than I could give you.

**Aspray:** Could you tell me something about the time you were editing it? How strongly did the math department support the journal? Did they think it was important?

**Church:** Well, they yielded finally to the fact that it had a big reputation elsewhere. There were not many others interested in this field, and it was thought of as not a respectable field, with some justice. There was a lot of nonsense published under this heading. I definitely had the idea that one of the things the journal had to do was to suppress this. There were some savage reviews that were written of nonsense papers; I kept them polite, but they were still sharp.

**Aspray:** And you kept a firm hand on what got published and what did not?

**Church:** Yes.

**Aspray:** Did you have pretty much entire editorial control over publication at that time?

**Church:** There were several editors. I did not try to second guess the other editors when they decided to accept or reject contributed papers.

**Aspray:** I can't recall who the other editors were now. Can you tell me?

**Church:** At first there was no one who stayed very long, except myself. I persuaded a man to take a three year term, and there were a number who lasted even longer. A library that has a complete set of the journal will quickly answer that question.

**Aspray:** I can find that out. To what extent did the department provide you with support, such as secretarial help and money for assistants?

Church: I had a half-time secretary, supplied I think, by the department.

Aspray: That could have been supplied by the Association.

Church: Perhaps, but probably not because they were hard up for funds from the beginning.

Aspray: I know that the *Annals of Mathematics* was more or less reviewed in-house in Princeton. Was that true of the *Journal of Symbolic Logic* also?

Church: You mean that they used only Princetonians to referee the papers? That certainly was not true of the *Journal*. There were no other logicians at Princeton, unless you count the visitors like Goedel and Bernays.

Aspray: One of the things that Professor Tucker is most interested in getting on tape are recollections of the Princeton environment, because many people thought of it as a special place in the '30s, especially after the Institute was established.

Church: Yes, long before that there certainly was an intense interest in mathematical research, and Veblen exhibited that spirit.

Aspray: What kind of decisions were made administratively to allow or to foster this kind of environment?

Church: Well, that I really don't know.

Aspray: For example, the new Fine Hall. Can you comment on it?

Church: Somebody gave money for that specific purpose, but I can't remember who it was.

Aspray: It was the Jones family.

Church: Yes, they were probably friendly with some of the mathematicians.

Aspray: I think they were quite friendly with both Dean Fine and also L.P. Eisenhart.

Church: Yes.

Aspray: But, architecturally speaking did the building fit the requirements of a mathematics research group?

Church: Yes. It was fancier than necessary and not strictly utilitarian. But at the time Princeton was going in for Gothic architecture. All the large offices were paneled in wood up nearly to the ceiling and with elaborate carvings. I assume it is still there. The math department moved, of course, so some other department has it.

Aspray: The East Asian Studies Department is there now and still has all the nice carvings. Do you remember going to tea? Was this a regular part of your day?

Church: Yes. Veblen used to run those himself before there was any Fine Hall. He promoted that as a way for people interested in research to get together. So afternoon tea in Fine Hall was really a continuation of Veblen's teas in Palmer Laboratory. It never worked much for me. I was too much of a loner, but I think in other mathematical fields it was a very useful thing.

Aspray: Did you go anyway? Regularly? Or sometimes?

Church: Yes, I used to go to their teas in the afternoon. I never had any mathematical conversations with anybody, because there was nobody else in my field except a student or two. [Afterthought: An exception must be made in the case of Bernays while he was there; with him there were often conversations at tea time. A.C.]

Aspray: How was the library?

Church: That was very good from the beginning. I think a lot of effort and probably a lot of money was put into getting a good mathematical library.

Aspray: That reminds me about another question I have been meaning to ask you about the *Journal of Symbolic Logic*. It seems that the journal had interest in historical and bibliographic information. It kept you up to date in those ways, as well as publishing research.

Church: The intention at the time was to review everything that appeared in the field. A bibliography which was meant to be complete of earlier things was published, and the reviews up until about 1950 were quite complete. The field kept growing and the reviewing got to be too big a job.

Aspray: I want to say to you that when I was coming through graduate school interested in the history of logic, they provided an invaluable source. They were a real service.

Church: If used right they should be very valuable. I have an idea that few people really use them right. At any rate it could not be continued, because the field got too large and there were not funds around to do it.

Aspray: I have the impression that many at Princeton were rather social people, that people like the von Neumanns, the Eisenharts, and the Robertsons were all people that made their homes available regularly for big social occasions.

Church: Yes, that is true. Veblen was a great advocate of getting together informally. His teas were in the same spirit. He believed in taking long walks through the woods to discuss mathematical research. It never worked for me, but maybe it did for others.

Aspray: Was the relationship between the graduate students and the faculty fairly close?

Church: I think so, yes.

Aspray: Can you tell me something about the role the Depression played in the development of mathematics in the '30s? Were there opportunities for getting students funds for research? Did it make any difference in your own career?

Church: As far as I know, it made no difference to me. Neither do I have much of an impression of the general situation. The university was evidently hard up. For example, they postponed promotions for the faculty.

Aspray: Did it affect your being able to help your grad students find positions, for example Rosser and Kleene and Foster?

Church: There was never any real problem.

Aspray: I seem to recall that Kleene told me that he was ready to go out, that there was not anything for him for a year or two, and that Princeton found money somehow for him to stay on.

Church: I don't remember any agonizing delay about his getting a position, but it could have been he stayed a year or two longer than was absolutely necessary.

Aspray: Do you remember any discussions in the '30s about the hiring of immigrant mathematicians or of bringing in a large number of foreigners as researchers? There were big battles going on, maybe just underneath the surface, about ...

Church: Yes. I wasn't a party to said battles, I am sure. Many were invited to Princeton, and I did not hear any opposition to it.

Aspray: Princeton seems to have been unusual in opening its arms to immigrant mathematicians, unlike certain other centers at the time.

Church: Yes. I suspect that this was partly Veblen's influence, but I don't know.



