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The Princeton Mathematics Community in the 1930s
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ERNST SNAPPER

(with ALBERT TUCKER)

This is an interview with Ernst Snapper at Bradley Hall, Dartmouth College, on Thursday 7 June 1984, conducted by Albert Tucker.

Tucker: Well, Ernst, tell us something about your coming to Princeton: how this came about, and what your impressions were when you arrived there and met the inhabitants of Fine Hall. This was in 1938, wasn't it?

Snapper: Right. Well, I would say that it came about because it was well known that Princeton was the best school of mathematics in the world at that time. Both my father and I wanted very much that I would study there. Actually, the president of the Institute for Advanced Study at the time was Abraham Flexner, who was a friend of my father. My father came to America early in 1938 because he was going to work for the Rockefeller Foundation. He talked things over with Abraham Flexner, and, as I understand it, the way I got into Princeton was that Abraham Flexner kind of arranged it with Dean [Luther P.] Eisenhart. Well, once I was there I saw, of course, the overpowering influence on mathematics and people by Lefschetz. Lefschetz was not at that time the chairman of the department. Eisenhart was dean of the graduate school and chairman of the math department, but the real day-to-day influence definitly came from Lefschetz. Lefschetz, I thought, was a very admirable person. He stood for excellence in all departments of mathematics, whether research or teaching or journals or book writing. He would support any young person with promise, in fact he was always with young people as much as he could. He would always support them as long as he felt they were serious and promising.

He also was a lot of fun. I can, for example, remember what he did to Bob Hooke one day. Bob Hooke wrote his thesis under Claude Chevalley, and Chevalley told Lefschetz that it was a very fine thesis. So, Lefschetz immediately arranged it that Bob could stay for another year at Princeton. He called Bob in and said approximately the following: "Well, you have written a fine thesis. Now why don't you stay here another year and learn something. Stay another year, we can pay you $8,000." I am making up the number $8,000. Bob kind of hemmed and hawed and said "Well, I've got to speak to my wife, Anna. We have a child now, and I must see if we can live on that. Let me talk it over with her. Furthermore I have another opportunity. Raleigh, in North Carolina, is after me. Perhaps I should start my academic career." Lefschetz had a few more words: "You better stay here, Bob, and learn something, but let me know your decision."

Well the next day or so, Bob came back to Lefschetz and said, "Professor Lefschetz, I have talked it over with my wife, and we have decided that I should start my academic career and go to Raleigh." Professor Lefschetz said, "Well, alright you made a decision. Good luck to you, good luck to your wife." When Bob was walking out of the room Lefschetz stopped him and said, "How much are they going to pay you in Raleigh?" Bob said, "Oh, about $10,000, sir." Lefschetz answered, "My God, Bob, $10,000 with a wife and a child. How can you live on that?"

In his relations to [J.H.M.] Wedderburn, it was my impression that Lefschetz, of course, admired Wedderburn as a mathematician, but he did not admire or even approve of Wedderburn as a man. Wedderburn by that time kept himself very isolated from the department.

Tucker: He was a recluse?

Snapper: Yes, the only one with whom he was really on friendly terms was Dean Eisenhart. In fact, they were on a first-name basis. Lefschetz, I think, did not approve of the fact that Wedderburn kept himself isolated to the point that he would not really do anything for the department. In the old Fine Hall, there were four super rooms that were occupied by the four superstars of Fine Hall. Wedderburn had one of them.

Lefscheft did a beautiful thing when Wedderburn retired. At that time Lefschetz was chairman of the department. He went to the administration and said, "We have Wedderburn retiring. He is one of the men that made Fine Hall what it is. Make an exception for him, and don't throw him out of the room." It was customary that whoever had one of those super rooms gave it up when he retired, but Wedderburn kept his room until the day he died.

I'll tell you another story about Lefschetz that involved Wedderburn, a little story that even Al Tucker may not know. I was back in Princeton in '49-'50, and at that time, Al had one of the super rooms which was given to me during the year. At that time, Lefschetz was writing one of his books on algebraic geometry; it was published in

the Princeton Series. I spent that year really learning algebraic geometry from Lefschetz, and since I helped him with blacksmithing to get the book in shape, Lefschetz thanked me for that in a typical Lefschetz way. He came into my room about twice a day asking, "Ernst, what do you want to talk about?" So I learned a lot of algebraic geometry on a one-to-one basis from Lefschetz.

Well, one day I saw on Al's shelves a very famous book the *Trattato* by Severi, so I said to Professor Lefschetz, "I would love to have that book and learn a lot from it. It is hard to get such a famous book. I think when I go back to California, I will just swipe the book. Al will never know; he will never read that book." So Lefschetz said in a kidding way, "You can't do that Ernst. You'd be a thief and then we couldn't trust you anymore." That was the end of that. Well, I was back in California teaching at USC, when one day a package arrived. In the package was a copy of the *Trattato* by Severi that was owned by Wedderburn. Wedderburn had died by this time, and there was a little note from Lefschetz saying that it was his job to see to it that Wedderburn's books would go to the right places.

Tucker: Wedderburn, in his will, left his books to the math department.

Snapper: The note continued, "I am sending you the book, use it. But if at anytime you tell somebody that I sent it to you, I will call you a liar." Lefschetz, of course, was a tough cookie, and for that reason some people did not like him. I always thought that the person he was toughest on was himself, and I certainly admired him for all the things he did. He was just as tough on the big people as on the small people. I remember, for example, it probably was the very first lecture on computing given by von Neumann. The lecture was being given in the small lecture room in Fine Hall, and, of course, everyone was there to listen to it. One of the people who were there was Lefschetz. Well, about halfway through his lecture, von Neumann said, "Well, so far so good," and Lefschetz spoke up from the audience and added, "and so trivial."

There is also a good story about Lefschetz and Einstein, which again shows that he treated everybody the same way. There was a luncheon, and at the luncheon was Einstein and Lefschetz and Hodge from England and others. At a certain moment people asked Einstein, "How do you like it in this country?" Einstein said that he liked it very much, it was a great country, and he was grateful for what Flexner and others had done to bring him to the Institute.

There was however one thing he really did not like, namely that people stopped him on the street and asked him for signatures and other things. He was always recognized. According to the story, which I have from Hodge, Lefschetz turned to Einstein and said, "Well, Herr Einstein, I can tell you how to stop that." Einstein said, "Oh, Professor Lefschetz, I would be so greatful. What can I do about it?" Lefschetz said, "Cut your hair."

Guido Fubini-Ghiron once explained the "Fubini gun" to us. Fubini was giving a course in interior ballistics and began by explaining when the trajectory of a bullet is a parabola. He stated the usual conditions and then added: "Furthermore, not only should there be no air—you should be in a vacuum—the projectile should be a perfect sphere, otherwise you won't get that parabola." Then he went on, "No, it doesn't have to be a perfect sphere. It may be a cylinder, as long as the axis stays parallel to the trajectory." And he went into that. "That is why it works with a sphere, because any line through the center of the sphere is an axis of symmetry." Then he said if that does not happen, you can get all kinds of curves. "For example, you can set your interior ballistic in such a way, and your projectile again is a cylinder, that the cylinder comes out of the gun and the axis always stays parallel to itself. Then you can very well have a curve which has a double point. It comes back and it hits behind the gun." So now we all laughed, because it would hit your own troops.

It was in the small lecture room in Fine Hall, and Fubini became as red as a beet at our laughing and got all excited and said, "No, this is very important, and now I'm going to tell you why." Then he told us that with the heavy cannons they were using, you could not give them too much of an elevation. "So it could very well be that the enemy is behind a mountain, behind a big hill and you are in front of it. You want to shoot over that mountain. You can put your big cannon very close to the mountain but not far from the mountain because it is too marshy there, and then you can only shoot over the mountain if you give your gun enough of an elevation, but a heavy cannon can't take much elevation. So what you do is, you point your gun toward your own troops," and he tried not to laugh, "and you take a Fubini gun, and there goes the bullet. There is the double point, and there comes the bullet back over the mountain and kills all of the enemy." He told us that he had told this to people, and people had taken him to the Pentagon where he had explained his idea to people high up in the Pentagon. But they had kind of walked him out of the room, and that was the end of that.

Another thing about Guido Fubini-Ghiron comes to mind. One day—we were students at the time—we got a phone call from his landlady: "I'm worried about Professor Fubini. He hasn't come home. He is always home at this time in the evening. (It was 8 or 9 o'clock.) Would you boys go out and look for him." So we went out, and we looked everywhere. In fact we got worried. Had he drowned in Carnegie Lake? We went down to Carnegie Lake. Finally somebody got a bright idea and said, "Let us check the elevator in Fuld Hall. Perhaps it got stuck, and he can't reach the button." (The point is that Fubini was practically a midget.) So we went out there, and indeed the elevator was stuck. We got it down, and Fubini came out full of fun. He kept saying, "You saved my life" and things like that. He gave us a party; we all went down and drank beer. He put a little sign on his room where he lived: "To my landlady: when I am not home at 6:30 at night, please check the elevator in Fuld Hall." He was a great guy, absolutely a great guy.

Tucker: Anything else you can think of.

Snapper: Well, right now, nothing comes to mind.

Tucker: Well, thank you very much Ernst.