

An Interview with

JACK P. RUINA

OH 163

Conducted by William Aspray

on

20 April 1989

Cambridge, MA

Charles Babbage Institute
Center for the History of Information Processing
University of Minnesota, Minneapolis

Copyright, Charles Babbage Institute

Jack P. Ruina Interview
20 April 1989

Abstract

The interview is mainly concerned with the beginning of the Information Processing Techniques Office within ARPA. The following issues were discussed: the initial goals, how the idea of an information processing program was initiated, the selection of the first director, and the working relation Ruina had as the Director of ARPA from 1961-1963 with the Director of the computing program.

JACK P. RUINA INTERVIEW

DATE: 20 April 1989

INTERVIEWER: William Aspray

LOCATION: Cambridge, MA

ASPRAY: This is an interview on the 20th of April, 1989, with Jack P. Ruina in his office at MIT in Cambridge, Massachusetts.

RUINA: ... Now, if there was somebody here who was there the same time, then in the course of discussion, you know, I am sure things would come up that would, perhaps, make me remember the missing links, the whole thing. Let's see. You ask the questions.

ASPRAY: Okay. There may be many things, or some things, that you want to say that I have not touched on.

RUINA: When you ask the questions I think I will find that, I will not remember almost everything. It was not a major program, you see.

ASPRAY: Yes.

RUINA: It had just started. The major programs we had were ballistic missile defense, nuclear test detection. They were the very major programs, and this was a program just starting, and it was a relatively small one. It was a new initiative. It was not front and center for me in terms of occupying my time.

ASPRAY: In a sense, it seemed to us to come out of two other activities: efforts in command and control, and out of behavioral sciences with the hiring of Licklider.

RUINA: They were two separate efforts, and, as I remember, we had just got the same guy to run both. But basically, what came to our attention were the possibilities of doing something useful in two different areas.

ASPRAY: Could you give me a brief description of what your program of effort was going to be in those two areas?

RUINA: Yes, well, let me tell you a little story about... why I felt rather positive, as I recall, about the computer effort, and not too positive about the behavioral science effort. From my experience in the Pentagon of a couple years, what I found was that the growth in computer technology, hardware technology, clearly was exceeding what people knew what to do with it -- in terms of not just number crunching, but once they wanted to get in to do analysis. I remember specifically that the Air Force wanted to get a large computer system to help them in intelligence analysis. We went through the details of just how it would be useful. On the whole, things seemed so simple-minded to me. This sort of software, programming, and understanding what the power of these things would be, other than number crunching, was something that impressed me at the time as something that was clearly in order, that the government was confused. Somehow, people saw something there, but were not prepared to invest big money without knowing quite what they were about. It was not my idea that ARPA should be working with computers, but somehow when the idea came to me from the staff (I was a director and it was a large staff), saying, well, why don't we start a program along these lines, I was impressed. I am not sure how it originated. Really, the basic idea, whether it was a committee, or a meeting, or what have you, when it came to me I remember being impressed with the fact that this sounds reasonable. To my mind, the issue at that time was how to explore the potential power that was growing in hardware for applications other than straight number crunching.

ASPRAY: Now, this was before Licklider came?

RUINA: This was before Licklider came, actually before we were going to take the job. So I was very positive about that. In the behavioral sciences I was negative, not because I was making behavioral sciences more important than they were (?). There was some great work being done by some great people, whether it was Freud, or what have you -- very important. But I thought, at least my memory was, that the typical contractor work that was being done -- contracted work in sociology, and organization, and group dynamics, that sort of thing, was just not doing very interesting things, and we were just going to get involved in something that was not going to be interesting, and that it was going to be troublesome from a bureaucratic point of view, and from a political point of view, because these things are always misunderstood, if there was a title there that congressmen could easily make fun of, or the congressional staff could make fun of. At the time, or soon afterwards, American University had some kind of a behavioral science program that was defense-fund supported that got into some trouble. It was easy to ridicule them.

I thought that unless there is going to be a big payoff, it was not worth the effort. If there would be a big payoff, fine. Somehow I did not see the big payoff. Now, again, I do not remember how Licklider's name came up, but when it came up I had known of him, and maybe met him once or twice. I was not a close friend of his at the time, but I knew of him. I knew that at one time he was part of this MIT group of psychologists that were interested in computers... Oh, Bill McGill (?) and some others. Then there was someone at Harvard. And the idea of getting somebody who seemed like a very distinguished and accomplished person was very impressive. I cannot remember how the idea of his running both programs came up, but it seemed strange that the same person should be running both. At the same time, it did not seem that unreasonable and, as I said, he was a man of some distinction, so I went for it right away. I remember talking to Lick about this when he came and challenging him by saying, "Tell me what has happened in the last 20 years in behavioral sciences that you would think of as a breakthrough in the sense of giving us new concepts, and thinking, and important contributions, and asked, essentially, did it come from any government contract -- cut-pipe work, or was it a guy who is more of a novelist like Tolstoy who was able to do great human insights without having to get a government contract to do it?" He said he would think about it, and I remember he came back and could not produce anything that was very interesting, and I said, "Yes, that was my concern about that program." Anyway, he took a lot of initiative when the program got started and, of course, then started working on the possibility that computers were going to get very powerful and very big, and instead of having everybody have their own computers, which was the way the technology really went, he said it would be much more efficient to have large, powerful machines where everybody has access, individuals have access, very much like a utility. You do not have your own little motor generators that sit in each house, but you have one big utility that does it. This all seemed to be in the air then, and I think people at MIT were the ones who started thinking along those lines. On the other hand, it was interesting that, even then, it was clear that whether it goes one way or the other depended on the specific technology, because steam was also generated in large cities in the central pipes, and people piped steam to the houses for heating. But yet, that turned out to be a less efficient way of doing it, and it was better for everybody to have his own little heating unit rather than a central steam source. But certainly for electricity it did not seem to work that way.

ASPRAY: Were these analogies made at the time?

RUINA: Yes. So the idea was that of moving into multiple access to large computers and that they would be

computer utilities and therefore the software and applications would probably be driven by these sort of architectures. You know, I followed it with great interest, but the initiative was taken primarily by Licklider. My interests were really in ballistic defense and nuclear test detection, which was the issue of the day. I mean, when Mr. McNamara and then, the Secretary, asked to see me about something, he never asked me to see about computer science; he asked me to see about ballistics defense or nuclear testing detection. So those were the big issues. This was a small but interesting program on the side.

ASPRAY: Well, what was the mandate you gave to Licklider when he came?

RUINA: I do not remember.

ASPRAY: You do not remember.

RUINA: There must have been a written document. In order to get approval to get this program there must have been a written document, and there must have been some congressional testimony, and I do not remember that. I did not do any homework for this meeting, so I did not look it up.

ASPRAY: Sure.

RUINA: I am not sure I could have. I am not sure I have the documents. Just a little bit. It had a small place, yes. No, I can imagine that. Have you talked to Lick?

ASPRAY: Oh, yes.

RUINA: He is the guy who would have a better memory. I am sure I never compared notes with him about this. His perspective must be somewhat different, coming into this agency and so on; mine was starting up this small program.

ASPRAY: It seems to me Licklider was a distinguished researcher in psychoacoustics, was somewhat knowledgeable about computing, but I would not think of him as a primary choice to run a program if it were going to really move

into computing. There were lots of people who were already working in computing.

RUINA: Yes, I think you are right. But there are two things. I think that very often the guy running the program at the top does not have to be the specialist. He has to know the culture, and know the values, and have good sense. Fairly often, if a guy at the top is a specialist himself in an area, the program can get distorted because he has his own strong views about the only directions to take, and not other directions -- you know, schools of thought, form within fields. If you are in one school you dismiss the other one entirely, "This guy is off the wall." I have heard many of my friends who are Nobel Prize winners, some in physics, ridicule each others' work. They say, "Yes, he's a pretty smart fellow, but I think he is on the wrong track." If he is a sponsor of work he may not even be supporting the other guy. There is a little bit of danger in too much expertise. I think good taste and understanding the culture and understanding the issues, in some ways, is more important. The fact that Licklider was rather distinguished... Most government bureaucrats have not distinguished themselves in the scientific field. They may be excellent and doing outstanding work in serving the field and the country, but they are not distinguished. And here we had somebody who was a man of some accomplishment as an academic, and maybe that overrode in my mind the other factors. As I recall, he used to tell me how he liked to spend a lot of time at a computer console. He said he would get hung up on it and become sort of addicted to the facility.

ASPRAY: At the time that Licklider came, there was already some activity being sponsored by ARPA in computing to the extent that they were supporting some research that was going on at SDC.

RUINA: Yes. Which program was it being supported under?

ASPRAY: Well, I am not entirely sure. They had received one of the enhanced computers for the SAGE system.

RUINA: That was an SQ7, I think. I am surprised that that was... It was a big IBM computer.

ASPRAY: Yes, it was an IBM computer that was not being used otherwise, and they were trying to do some early work developing a computation lab...

RUINA: Well, they were involved in software. That was their big thing. I cannot imagine which program it would have been supported under, except perhaps somewhere in the ballistics missile defense project.

ASPRAY: The actual work that was going was trying to use that computer to make it into a timesharing system.

RUINA: Oh, is that right? Is that before this program got started?

ASPRAY: That was before this program got started.

RUINA: You know, if somebody asked me whether we did that, I would have said, "I have zero memory of that event." I knew of SDC as a company, and I sort of knew their problems. They had split off from Rand, but I was not aware that we had done that for them at all.

ASPRAY: Okay. The way that Licklider tells the story of his coming to ARPA (or at least what he does when he gets there) is that he has this request to do something in the computing field that would relate to command and control work, but that he had in mind this mission of getting research sponsored on interactive computing -- that if it had benefit to command and control, so be it. That would be all well and good. But he had this personal mission of going ahead with the development of interactive computing.

RUINA: But see, command and control is a big subject. I think my memory here is not that bad. Again, what stuck in my mind was that many applications of the Air Force... See, before I got the ARPA job I was a Deputy Assistant Secretary of the Air Force, and a lot of things came up to me, sort of for approval, that had to do with buying computer systems like the 7L and 415L (I have forgot the numbers). But as far as the use of computers for intelligence, you can say, after all... that command and control involved intelligence too; there were intelligence applications. You know, all kinds of large-scale pattern recognition applications that people are thinking of. And as I said, the technology was not ready for it. That is what impressed me. But in any historical work you have to differentiate between the written word and what really was going on. Very often, the writing was to meet certain bureaucratic requirements: to justify to Congress or to get it through -- not the secretary. I mean my boss, Hal Brown, was terrific, and his boss, McNamara, was terrific, and I never played any games with them. But the paper

trail very often would emphasize the important applications in command and control, and the battlefield. They had to show how defense directly related... We all knew that, of course we had to have applications in defense, and in these big areas. So, it stood out. It does not surprise me at all that we used the emphasis on paper of command and control, to my mind the big thing was basically, the possibility of interactive computers and also the large-scale computer with peripheral workstations, and then just writing software for use in these problems. If you ask me, these were the issues.

ASPRAY: Okay. Can you tell me something about your mode of operation with Licklider, your interaction with him? How thoroughly involved were you in setting his program, in setting his budget?

RUINA: Not very much. My expectation is only once a month, at most, that I would see him. His office was on a different floor. I was on the fourth floor in the E-ring, and, as I said, my total emphasis was on the program we were running, a program that was then about 150 or 130 million dollars a year. Ballistics missile defense research was running at about 60, 70 million dollars a year. And then there was a program in nuclear test detection. These were the hot issues for us all the time. So computing was somewhat peripheral. I had great faith, and I am impressed because, as I recall, the history said that my management style was to let people, especially those people that I had confidence in, to leave them alone. That was the case as far as Licklider was concerned, I suspect. Again, I would say that I met with him perhaps once a month, and that is about it. Whereas, I must have met with the ballistic and defense people five times a day on different issues.

ASPRAY: Do you remember anything about the budget and budget increases over time?

RUINA: Well, I was not there. When did these programs start?

ASPRAY: They started in early 1963.

RUINA: Well, I left in July.

ASPRAY: In July, okay, so that you would not have been party to that. Do you have any sense of there being any

interest in the computing program in other offices, in the Secretary of Defense's office, at this time?

RUINA: I expect the only person of a high rank in the Secretary of Defense office that I may have discussed this with at all, may have been the guy who is in charge of intelligence operations in the sense of research and development intelligence -- not intelligence operations. It was a guy named Bruno Augenstein who came from Rand. Bruno was sort of interested in these things. So, again, if you said, "Did you have any conversations with anybody?", my guess is, not many, but a few on the subject -- more likely with Bruno than with anybody else.

ASPRAY: Especially in the early years of the information processing program we see lots of interaction with IDA. We have not been able to identify names of any people to talk to in IDA about this. Can you make any suggestions?

RUINA: Well, I think... Let's see. The people who were there... It would not have been the Weapon System Evaluation Group. It would have been what they called the Science and Technology group. You know, I later became president of IDA in 1964. They had a senior psychologist who was sort of a rather distinguished psychologist, who is still consulting for them. He must be in his 70s. His name is Jesse Orlanski.

ASPRAY: The name is familiar.

RUINA: Orlanski would be one person. Another person who is involved in this stuff, not so much in computer science but another psychologist, was Wally Sinaiko. He works for ONR but he is on the payroll of the Smithsonian in Washington. So Orlanski would be the number one person who would remember. He would remember more than anybody else. He was there, and he was an oldtimer there. Another guy who may remember, a guy who was there longer, who may have died, is Elliot Montroll. Bob Fox was head of that group after I was there. He was head of the group when I was in IDA, but not head when I was in ARPA. He lives in Washington and is retired -- Robert Fox. He is a physicist, and he might have some memory of what was going in the IDA connection. But that is about all I can think of. There must have been some others, I am sure. That is why if somebody else there is mentioning names...

[INTERRUPTION]

The computer group at IDA was doing very classified work and I doubt if Licklider had access to it. That was a group at Princeton. They were on the campus and it was an IDA group doing super-classified work for actual security reasons. I think I was the only one in Washington that had access to that stuff.

ASPRAY: Given the nature of your interaction with Licklider and your interests being elsewhere, it is not clear to me what other questions I should ask you.

RUINA: That is right. That is why I thought when you called that I would rather not; I was rather skeptical about the call. If you had come to talk about nuclear test detection, or ballistic missiles, or even fuel cells, or some of these other programs we had, or even some of the programs in the Defense Department that some of my colleagues are responsible for, which were much more psychologically consuming of my time and interests. You know, a similar sort of field -- sort of fun to watch. You must have learned how small the budget was.

ASPRAY: About ten million. Right. Compared to the others it was much smaller.

RUINA: Yes. It was much smaller. I think that most of the interesting stuff, in terms of substance, came later. These were the projects that started under Sutherland, that came after my day. And my successor was Bob Sproull. I know you have talked to him.

ASPRAY: I have not, but we plan to.

RUINA: I know his memory of all that is better. Then there is Charlie Herzfeld. I think the programs grew more in substance and got really rooted.

ASPRAY: What we have found is that, at least the Information Processing Office, has not been a very good record keeper over time. If we wanted to look for trails of records do you have any recommendations? I mean, we have looked at the records that the office itself directly deposited in the record system.

RUINA: That is the only place that I would know. I think the stuff that came at the top was more a case of staff work making up things to sort of make life easier for us on this, the path to control, and things like that. Again, I personally wasn't involved with the program.

END OF INTERVIEW