

Now, would you tend to agree with that aspect of it?

Mr. SQUIRES. Yes, I would.

Mr. HORTON. That we think in terms of protection of the individual's rights in the nongovernment aspect of our society in addition to the governmental aspect of our society.

Mr. SQUIRES. Yes, I definitely think so.

Mr. HORTON. I would like to ask you this: Are you in the technical aspect of computers? In other words, what is your specific field?

Mr. SQUIRES. Well, specifically I am working on programing systems.

Mr. HORTON. Are you an expert in the technology of computers, or are you more an expert in the field of the philosophy, or the use of computers, or both, or something else?

Mr. SQUIRES. I am afraid I don't really know how to answer that question.

Mr. HORTON. Do you design computers?

Mr. SQUIRES. No, sir, I do not design computers. I am presently at the University of Illinois. There are fellow scientists with whom I work who do design computers. My activities are more along the programing line, designing the programing systems, or software, as we referred to them in the testimony.

Mr. GALLAGHER. In other words, you engage in the computer sciences?

Mr. SQUIRES. That is right.

Mr. HORTON. You are more in the programing or use of computers as opposed to how they are built and designed, is that right?

Mr. SQUIRES. Yes, sir.

Mr. HORTON. Then I think this question is properly in your area: Do you have any suggestion as to how, programwise, this committee can make any recommendations or take any action which will protect the individual's rights in the use of the computers?

Mr. SQUIRES. I think some things can be done programwise, but they are somewhat minimal in that the information is stored in the machine somewhere.

One way of getting this information out of a computer is to do what is called a dump; what this amounts to is connecting the tape or whatever the storage device is to the computer and asking the computer to print out just exactly what is on this storage device. You then get a hard copy record of what was there. What you are asking is, is there a way to prevent a program from doing this? Strictly from a programing point of view, I do not believe there is.

Now, the information could be stored in the machine in cryptographic forms or it could be sorted and this should be done, as Mr. Baran has suggested, but even if it is in a cryptographic form, if a person knows the code or can invent a decipher for it and he has access to the computer, he can write a program to decode it. So I don't see programing alone as being the solution. I think it will have to be partly programing but a large part of it will have to be associated with the hardware.

Mr. HORTON. In other words, to define the areas with which we have to be concerned, we must consider how safeguards can be built into the technical system, that is, the mechanical system of the computers, and the whole problem of telecommunications and its ac-