

It might be helpful to draw some analogy between the present technology in this area and the nuclear-device problem, but I fear the analogy may break down before it proves very useful. There is a very important difference in these problems. The nuclear device threatens to physically destroy our cities and perhaps our country in a rapid series of large easily recognized explosions. The invasion of the privacy of our citizens threatens to carry out a destructive mental process on a gradual, less perceptible scale, under the guise of causes that individually seem justified.

In preparing for this hearing I felt it appropriate to read again John Stuart Mill's essay, "On Liberty," in which he says:

The sole end for which mankind are warranted, individually or collectively, in interfering with the liberty of action of any of their number, is self-protection. That the only purpose for which power can be exercised over any member of a civilized community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant. He cannot rightfully be compelled to do or forbear because it will be better for him to do so, because it will make him happier, because, in the opinion of others, to do so would be wise or even right. * * * Over himself, over his own body and mind, the individual is sovereign.

This committee has already heard extensive testimony regarding the collection of data concerning a person's thoughts, beliefs, emotions, and sensations. Professor Beaney and Mr. Speiser have testified—on pages 15 and 27, first session hearings—how such data can restrict the exploration of ideas, diminish intellectual curiosity, and restrain the free expression of thought. Mr. Mill's essay also develops these areas more fully. I would like, therefore, to extend these concepts as they relate to automatic data processing.

I cannot stress too much how important it is that this committee and our fellow citizens realize that a computer must be regarded as an information handling device rather than merely an arithmetic device. Perhaps the word "computer" should no longer be used, but rather some other expression such as automatic data processor, or information processor, or, as Dr. Peter Naur has recently proposed, datamation.

In addition to arithmetic operations, a computer can handle alphabetic and linguistic information. It can read, process, analyze, sort, store, and print such information at a phenomenal rate. A high speed computer memory now under development can read and write electronically at the rate of 16 million characters per second. A typical 300-page book contains about 1 million characters. The information storage capabilities are fantastic, although such a fast memory is extravagant in its use of space. It stores only 500 characters per cubic inch and it must be located within a very few feet of the central processor or "main frame" of the computer. Thin films and magnetic tapes are normally used for high capacity memories. A piece of magnetic tape about 0.0015-inch thick and 1-inch square, attached to a computer, can hold up to 3,200 alphabetic characters that can be read at rates exceeding 100,000 characters per second. This media packs information at a density of about $1\frac{1}{2}$ million characters per cubic inch. Thus a building, containing 10,000 square feet of storage space 10 feet high, could conceivably store a book of information about every man, woman, and child in the United States. Specific information about any particular person could be transmitted along any given telephone line within a few minutes.