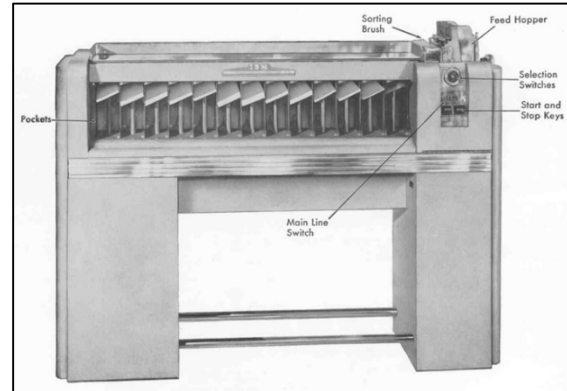


February 18, 2019  
(January Letter)

Dear Samantha,

Once we had prepared the computer cards as described in my last letter, we didn't immediately use the computer since we were unfamiliar with it and the programs for analysis of statistical information were hard to find. Instead, we used a counter-sorter machine.

As indicated in the image we put the computer cards into the "Feed Hopper" and set the "Selection Switches" to identify the particular card column of interest. For example, if we wanted to sort the cards by gender, we would set the switch to sort on the card column into which the respondent code for gender was located (e.g. column 5 could have been punched as "1" for girls and "2" for boys).



When we turned on the machine it would read all the cards and sort them into two piles: one for girls and one for boys. They would be stacked in two of the "Pockets" as identified in the image.

Then if we wanted to see how the girls responded we would take the stack of cards that was representing the girls, put it back in the hopper, reset the dials and get the machine to sort all of the girls' cards into the types of responses for which we were looking. Once that was done, we would do the same thing with the boys. Fortunately, the counter sorter machine had little dials that would count the number of cards that were in each of pockets so we could easily keep track of the number of girls, number of boys, and each of their responses as they were sorted into the pockets. This was a laborious process since it meant that we would be taking the stacks, arranging the dials, running the cards through, writing down the numbers, and eventually constructing a table or graph that represented how many people responded in a particular way. It was much shorter than sorting the full questionnaires each time, though.

We conducted the first type of analysis using the counter-sorter. When I talked to people in the computing centre they told me that somebody had constructed a program that would read those cards into the computer and produce a table in a rudimentary form. This sounded interesting to me, so I checked how it would be done and what I would have to learn in order to do it.



In those days there was no such thing as computers in various parts of the university. There was one computer on campus that took up a whole floor in one of the buildings (like the image at the left). In order to use it, one would have to wait for a turn to do analysis. The process was one where you would prepare punch cards with program instructions at the front part and data at the back end.

After we constructed the program and punched the cards we would hike our way across the campus to the computing centre and hand them to the operators. Since there was only one computer (the "mainframe" computer)

we would have to wait our turn. This usually meant waiting 'till the next day before we would get the results.

As often as not we would come back the next day to discover we had punched one of the cards wrong so the program produced results that were meaningless. This meant we would have to go back to the cards, find out where the problem was, re-punch the card or cards that were causing the problem, then insert them into the stack before we hiked back to the computing center and once again put our stack of cards into the queue for the machine. As you can imagine, this was a long process but it was much better than sorting through 2000 computer questionnaires every time we wanted to do some analysis.

This was my first introduction to the use of computers. As we became more proficient at getting the programs right and using the machine properly, it became very useful since we were able to do analysis that otherwise would have been much too long.

As I worked with the computer, I became more interested in the programming part of the procedure and decided I would learn some of the programming languages that made it possible to produce tables and other statistical analysis. This led me to learning my first computer language: named "Fortran". I began to do analysis that was a bit more sophisticated but of course it still required me to have access to a counter-sorter and card punch machine.



The next big step occurred about 1965 when the university was able to set up "terminals" in various places across the campus. Instead of having to make the trip across campus with a deck of cards, they installed teletype machines in various parts of the campus. I could sit at it and type out my commands, programs, and data—then get a response back in a reasonably short space of time. These machines were like large typewriters. They typed very slowly and made a dramatic sound as they typed across the page and on to the next line. It was at this point that I decided to do some work trying to conduct sociological analysis or at least social psychological analysis where I would ask students to interact with the computer using these teletype machines. These became part of both my MA and PhD

theses.



Shortly after that time, the teletype machines were changed to large screens looking like a TV with a keyboard in front of them so that everything was produced on the screen. You may have seen some of these things depicted in some of the old movies about space or scientific activities.

If you wanted something printed out you either had to instruct the computer to print it out across campus or at some nearby printer. These terminals were often located in different departments—some of which had printers. Since I was the only person in the department who was interested in the machines, the UBC computing center

was very supportive of me, so that they ended up providing me with some of the equipment. The department allowed me to set it up in a small room where I would sit and do my work.

By the time I got to my job at Concordia University in 1972 (actually Sir George Williams University at the time), the availability of a terminal was something that was still rare on the campus. Once again, the computing center was interested that somebody in sociology could actually work with these machines so they were very supportive and set me up with a terminal type of operation. It was installed in a closet-sized room that was available within the department.

The next big computer-related event for me was when I was able to get a connection to the computer from my home.

This was done was through the telephone. I would phone a number at the computing center and put the headset onto a machine that would communicate with the mainframe computer. The local machine and the computer would “talk” back-and-forth to each other using a code that sounded like what you hear if you are sending a fax. This was a great innovation because it meant I could actually use the mainframe computer without having to go into town.



I remember Fran and I both used the terminal at home frequently. This meant that we would use the phone line and people wouldn't be able to call us. Eventually, we got a second telephone line so that people could make contact with us while we were using the computer.



By this time, “computer workstations” were introduced as computers became smaller and mainframe machines were not the only ones available. Workstations were standalone machines that had some kind of storage medium. These machines often had screens like television screens that you would control with a keyboard in front that would be used for typing in programs or data.



In the early days, information was stored on “floppy disks”. These were disks about 5 ¼” in diameter that were soft enough to bend. One disk could store about 360 KB of information. We would shove it into the machine and wait for the computer to read the information

into its memory. One of the discs would have the programs on it and the other had the data. This meant putting in the program disk, waiting for the program to be read, then putting in the data disk to run the analysis. I remember how annoyed Fran and Daegan were that we only had one disk drive because we were regularly required to load the program, then replace the disk with the data to do the analysis. Shortly thereafter Fran purchased a second disk drive to solve the problem.





The next stage was the advent of 3 1/2" disks that were able to store more information in a smaller space (720 KB or 1.44 MB for the high-density version). They became the standard for quite a while—until CDs and DVDs appeared. I expect you are familiar with CDs since they had a similar format to the music CDs that were standard until downloading and USBs took over.

The transition from mainframe computers to desktop, then portable computers was incredibly fast. It was only about 1974 that the first personal computers became widely available. One that was very popular was a Radio Shack (TRS-80). The other was the Commodore PET – and later the Commodore 64.



My father was very interested in the development of these computers, so he bought a Commodore 64 about the early 90s. It looked just like a keyboard, but when hooked up to a TV, a printer, and maybe a disk reader, it could be programmed for many different objectives. It only had 64 KB of internal memory, though, so it did not have any fancy graphics. By comparison, you probably have about 32,000,000 KB (32GB) on your phone! The C64 just used text-based interactions and clever lines and characters to set up games. The early PacMan games were invented to play on these types of machines.

All of this was happening before the development of the internet. There were some remote connections between specialized university labs, but the establishment of the world wide web didn't happen until after the mid-1980s. By that time, computers were getting much smaller in terms of size, much bigger in terms of memory space, and much faster in terms of processing speed. By the time that you came on the scene, the computers that took up a whole room in 1972 had become small enough to fit in your pocket along with your phone.

It is fascinating to consider what computers will be doing and looking like in the next 20 or so years. As I think back to what we imagined for the future in 1972, it is no-way close to what actually happened. I expect this will be the same if we were to try and imagine what things will be like in 2040.

Love,  
Bill