

A Personal Memoir, by Thomas J. (Tim) Bergin

The story of the American University Computing History Museum is sort of "a guy thing." By that, I mean the propensity of males of the species to collect "stuff". In various parts of this memoir, evidence will be given as to how this "tendency" became a "hobby", then an "addiction" and ultimately resulted in the creation of the Museum.

Computing as a Career

I started my career in computing as a "digital computer systems analyst (trainee)" with the (then) U.S. Veterans Administration (VA) in May of 1966. The first thing they did was send me to "Introduction to System 360" school at IBM Offices in Washington, DC. Someone else had been scheduled to take the class and he was ill, so they sent me. The second week was devoted to Assembly Language Programming which was, for me as an English major, like being in a foreign country and not understanding anything other than "break" and "lunch." I did survive, however, and spent 16 years with the VA in various capacities devoted to computers, as a systems analyst/programmer applying computers to engineering calculations (in the 1960's) and in managerial/staff level positions (in the 1970's).

Soon after going to work at the VA, I was asked to substitute for my boss and give a lecture at the "VA ADP (Automatic Data Processing) Institute," which was a week long series of lectures intended to introduce computers and computer applications to senior managers. Topics included: "What is a computer?" "How does the computer work?", and "How do you program the computer to do useful work?" I gave a lecture on the fundamentals of computers and got good reviews. When my boss heard that, he volunteered me to take his place. Soon, I was teaching 3 or 4 of the modules in the Institute. In the "how to write a program" class, I showed the "students" how to calculate the value of Manhattan Island using FORTRAN II on an IBM 1401 (pretty snazzy stuff for the time). In addition, speakers from various automation projects provided overviews of various applications, such as payroll, accounting, general ledger, etc.

During one of these lectures, I must have indicated a love of history, because someone in the class brought me a copy of B.V. Bowden's *Faster Than Thought: A Symposium on Digital Computing Machines*, London (1953). Later, another "student" brought me a copy of the *Punched Card Annual (1957)*, which has the great subtitle: *A Publication Dedicated to the Advancement of the Science of Tabulating Systems*.

From such small events was an *addiction* born! If I heard about anyone contemplating retirement, I would go and introduce myself and ask if they had anything from the past that they were going to throw away. In some ways, I thought of myself as a *computer conservationist*. Since that time, I have sought and collected literally hundreds of items (probably closer to 1,000) including old books and pamphlets, mechanical calculating devices, and a wide range of artifacts of early computer systems. It is important to note that as people learned of this *hobby*, they would send or bring me things, and my collection of *stuff* grew. My file of thank you letters is well over an inch thick.

Soon after I started at the VA, I was encouraged to look at graduate programs in computing. After looking around, a few of us enrolled in a course at the American University's Center for Technology and Administration which offered courses in management information systems, computer systems applications, operations research, and scientific and technical information systems. My masters program encompassed courses in the first three areas. I completed the Masters of Arts in Public Administration (Technology of Management) in 1970. A few years later, I was awarded a graduate fellowship. Unfortunately, the school I planned to attend cancelled the program due to an insufficient number of students. Since I had planned to study something, I looked around and found the Ph.D program at American University. I took courses during the fellowship year and continued after returning to work. I completed this program just after my third child was born in 1977.

American University <http://www.american.edu/>

In 1980, I received another fellowship under the Intergovernmental Personnel Act (IPA). This law allowed university and college faculty to work full time in federal and state agencies, and federal and state employees to teach full time in universities and colleges. I applied for a fellowship to teach at the American University's Center for Technology and Administration (CTA). My doctoral advisor was then the Director of CTA and I looked forward to working with him and the other faculty that I knew from my student days.

After teaching as a Visiting Professor for 18 months under the IPA, I returned to the position of Chief of the Technical Training Division. But the taste of teaching and the academic lifestyle was too compelling, so I applied for a teaching position at American. I was hired as an Assistant Professor of Information Systems and as Director of the Quantitative Teaching and Research Laboratory (QTRL). In the latter position, I directed a facility to support graduate student and faculty research using computers. When I arrived, the Lab had 4 ADM 3-A dumb terminals connected to the University's IBM mainframe computer. In the next year, I received a grant to add microcomputers. We added twelve IBM Personal Computers in the fall of 1983 with dual floppy drives (5 ¼ inch). Our software offerings included: Lotus 1-2-3®, VolksWriter®, dBase II® and some statistical packages (under DOS®).

During this period, I taught the Graduate Seminar in Information Systems, and would always give a lecture or two on the "history of computing" with an eye to opening the students' eyes to some of the significant people, ideas and devices which preceded their involvement in the *computer age*. As part of this lecture, I would often bring a set of architectural models of the IBM 1401 to class so students could see them. As microcomputers became more popular, mainframes started disappearing and many students had never seen one! I recall finishing one such lecture with the statement that "before I die, I would love to have the front panel from a 1401." The IBM 1401 was the first computer I wrote a program for in 1966. One day, when I came to work, I found a front panel from a 1401 leaning against my office door, with a note "Dr. Bergin, You probably don't remember me, but I was a student in your Graduate Seminar and remembered you saying that you wanted the front panel from a 1401 before you die. I intend you no ill health, but we were decommissioning one and I thought you would like to have it. Warm regards, Tom." Tom was a naval officer at a base where they were getting rid of an IBM 1401.

From this point on, I became more aggressive in my searching, and actively talked to my old colleagues at the VA and other government agencies trying to find materials on the early days of computing. It was also fairly clear, by 1985 or so, that mainframes and minicomputers were destined to go the way of the strap razor, the bustle, and the rotary telephone. It was at this time too, that I started visiting "antique shops" when traveling. I put quotation marks around "antique shops" because I believe that there are two kinds of antique shops. The first type has furniture, rugs, and sterling silver for sale and is presided over by an older lady wearing a silk blouse and a string of pearls. The second type of establishment, and the one I frequent most often, is basically a yard sale under a roof. This is the type of place where the grandkids bring the stuff they found in grandmother's attic after she passed away, including adding machines and old books on computers.

The collection was now beginning to grow and my office was beginning to look like a dump! After some serious reflection, I decided that I had to get rid of some books and other materials so that I could display my collection of artifacts and ephemera on the shelves in my office. This change must have been for the better, because I recall many a student saying, "Gee, it looks like a museum in here." I was fortunate in that my office had built-in cupboards and shelves along two walls -- perfect for my stuff!

The next big shift occurred in 1989, when CTA was merged with the Computer Science faculty of the Department of Mathematics, Statistics, and Computer Science in the College of Arts and Sciences. This relieved me of the administrative responsibility for the QTRL and I focused on teaching courses in the

(new) Department of Computer Science and Information Systems. As before, I devoted much shelf space to artifact display.

I realize that some of you are still wondering what I meant by the term “a guy thing” in the opening sentence. Well, a lot of guys collect things; some of us collect *stuff*. I had as many as 10 or 12 mechanical calculators by this time, some which I had purchased and some that had been given to me. Now, I have over 40 of them and another 40 adders of various types and vintages.

Here are a few of the items in the collection.

Lightening Adders. I found the first one in Charleston, SC while attending a professional conference, and another was donated by a fellow at the US Department of Transportation.



Comptator, purchased in Amsterdam, Holland for \$350 while on vacation.



Felt and Tarrant Comptometer, purchased for \$5.00 from a shop in Albany, NY while attending an NCAA basketball tournament in 1989.



A few years ago, someone sent me a note about a guy in New York who had some mechanical calculators for sale. At that time, my family and I would drive to Stony Brook, NY and celebrate Thanksgiving with my brother and his family. So I called the fellow with the calculators and made an appointment to see him on the Friday after Thanksgiving. I arrived at his typewriter and calculator repair shop about 3 in the afternoon and we were soon in his pickup truck heading to the house where he kept the calculators. They

were in a big pile in the basement. It seems that this fellow was an avid typewriter collector and he traveled many weekends in search of new typewriters. One day in New England, he met a retired college professor who had planned to build a calculator museum. Unfortunately, the professor had gotten too old to do so and wanted to get rid of his collection. The typewriter collector only wanted the typewriters in his collection but professor told him he had to buy the entire collection!

So there I was, a college professor who only wanted to buy 2 or 3 adding machines but faced the same choice: to buy the pile or leave empty handed. Now I had two problems: 1) fitting 13 dirty, smelly, old calculators into the family Dodge Caravan



along with a wife, three children, a good size dog, and our luggage, and 2) explaining my great find to my wife. The first problem was easier than the second. We made it home, but I seem to remember that it was a quiet ride.

Having done so well on this foray, I decided that another source of wonderful machines would be the typewriter and adding machine repair shops in the Washington area. Although I visited many, and got a few pieces here and there, the best place was a repair shop near the beach in Delaware. The owner had retired and a young fellow had taken over the shop. I asked him to intercede with the owner and he sold me three or four calculators. The following Todd Visible adder had a 1943 penny stuck in the mechanism.

Todd Visible Adder



This unit has the 9's complement on all keys except the unit's column, which has the 10's complement. Complimentary arithmetic was used to do subtraction with an "adding" machine.

The 50th Anniversary of the ACM

Two separate incidents converged to result in the Computing History Museum. The first had to do with a personal awakening, the second with the creation of a facility. In 1995, the Association for Computing Machinery (ACM) was planning to commemorate the 50th anniversary of computing at their Computer Science Conference in Philadelphia. It was in that fair city that I was born in 1940, and in which the Electronic Numeric Integrator and Computer (ENIAC) was built by the Moore School of Electrical Engineering of the University of Pennsylvania, from 1943 to 1946.

To commemorate the day on which the ENIAC officially ran its first program, the ACM wanted to have a commemorative program. I was asked to plan this event. This resulted in a Retrospective Program on the afternoon of Wednesday, February 16, 1995, which was part of ACM Computer Week. In addition, I assembled a History of Computing track for the Computer Science Conference, which took place on Friday, Saturday and Sunday. At one of the planning meetings for these programs, I met a young woman who had a contract to create a display of photographs about the history of computing. At a break, she showed me some of the material her firm, Expert Events (Philadelphia, PA) had assembled. The material, which had been gathered from numerous sources, had a number of errors. Since I don't carry all dates and spellings in my head, I invited she and her colleague (the photographer) to my office after the meeting was over. We spent the entire evening looking up, and correcting, the materials.

I guess it was not hard for Sharon to notice the artifacts filling all the shelves in my office. At the end of the meeting, she asked me if I could put together a display of artifacts for the meeting in Philadelphia. She said that she could borrow a display case and that she would help do the labels for the artifacts. Since I had no idea of the size of the display case, I just filled the back of my Dodge Caravan with everything I could fit in (which was a lot). Sharon had also called some people at Ursinus College and the Aberdeen Proving Ground and asked them to bring artifacts as well.

After a dinner meeting with my speakers for the Wednesday Retrospective Program, I met with Sharon and her co-workers, one of whom was there to create little cards to accompany the artifacts in the *eight foot long display case*. It looked like the largest display case in the world at that moment. By 2 or 3 in the morning, I had a "battlefield commission" as a museum curator!

The next morning, I wandered into the foyer where the photographic exhibit stood on 6 large 4 by 7 panels. Right in the middle was the display case with all my *stuff* in it. Wow, what a feeling! As I stood there, feeling exhilarated but very tired, I heard someone reading the little cards to a colleague, "from the collection of Tim Bergin, the American University." Another warm and fuzzy feeling! I realized that I was sharing my collection, and my (by now) hobby of collecting computer artifacts, with some of the top people in the computing field.



After the Conference ended, I separated the materials that Sharon borrowed from the people at Aberdeen from my material. When I went to return it, Sharon told me that the owner, a retired member of the Ballistics Research Laboratory staff from the 1950s, told her “Give it all to that nice *young professor*.” I guess his eyes were bad, but his heart was in the right place.

When I got back to American University, I took stock. I had a bunch of new artifacts, including large vacuum tube modules from the UNIVAC I, a number of original ENIAC manuals and an envelope of hand printed museum cards explaining what things were, the relevant dates, and who owned them. In the next year, this exhibit (more or less), along with photographs from my collection, was displayed four times at professional conferences and twice at the Bender Library, American University. Without knowing it, I had really become a curator.

The Computing History Museum

The next big step was starting the physical facility. The CSIS department was housed in an older building, Clark Hall, which had at one time been a dormitory. In the foyer of the building, were two old Diebold ATM machines. These had been disconnected for some time but not removed. Suddenly, one day in November 1997, the machines were gone. In their place was a *beautiful*, new, 4 by 8 sheet of ½ inch plywood! I thought to myself, “I’ll write to the Director of the Physical Plant and see if they will let me use the space for a museum.”



(The museum occupies the space to the left of the door)

It was a great day when I got a letter telling me that I could build a museum in the foyer of Clark Hall. Actually the foyer was an addition put on by the original owner of the ATM machines, a local bank. I quickly set up a meeting with the University Architect to find out what I had to do and how to do things. The University could not have been more supportive. From design to construction, they did everything with enthusiasm; I could not have gotten more support from family.

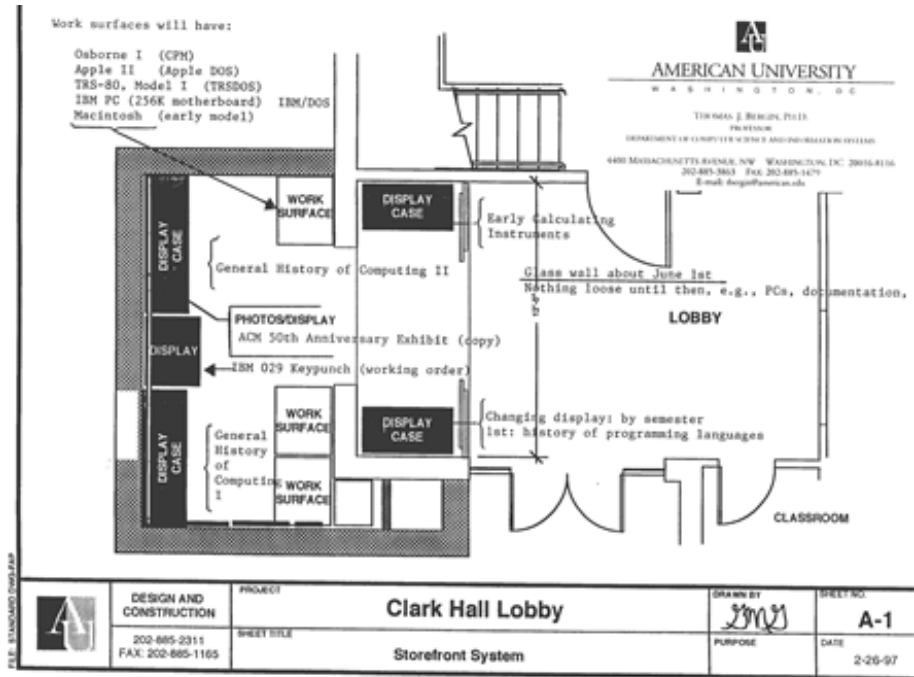


Figure 1, Architectural Drawing of Computing History Museum



From Figure 1 you can see that the Museum occupies two small rooms. The front room had been where people stood to use the ATMs; the back room had been just that, i.e., the place where the bank's employees kept materials such as deposit slips and loaded the machines with money. With the help of the University Architect, I laid out the Museum. Once again, providence intervened. What is a museum without cases to display things in? Well, the Network Administrator for the Computer Science and Information Systems department had come across two old display cases that had been abandoned by a department which moved off campus. Now we were getting somewhere. We had cases in which to display some artifacts, but there was more space and more *stuff*!

Since it was the spring semester, I was teaching my History of Computing class. I had kept the students informed about the Museum's progress, and I mentioned the problem of needing more display cases. After class, one of the graduate students told me that he was the president of the graduate student association and they had money to spend. Indeed, he said that they had to spend the money before the end of the semester, which was rapidly approaching. I said, "I think I can help you!," and started looking at display cases in catalogs.

At this point, another serendipitous event occurred. Unsure of myself, I took the brochures to a neighbor and asked his advice. He was the owner of a local glass and mirror company and was knowledgeable about display cases, since his company had made custom cases for the Smithsonian Institution. Jack said that the cases in the brochures were built to display eye glass frames, perfumes, and other small (lightweight) items. If I put a 65 pound Burroughs adding machine on the shelves, they would break. Jack designed and fabricated (at cost) two museum quality display cases which greet the visitor to the Museum.

Well, the Museum is now a reality. In addition to a replica of the photographic display created by Expert Events for the ACM, there are 4 display cases. The first case is devoted to **calculation**, and contains an abacus, a soroban, *replicas* of Napier's bones and a Schickard Calculator, numerous slide rules and hand adders and calculators (an Addometer, the Computator, and a number of large office adding machines, including a Burroughs, a Felt & Tarrant Comptometer, an American (made by the American Can Company), and a Brunsviga.



The second case is devoted to the **first generation of computing** and contains two pieces of the Babbage Difference engine (gifts of the Science Museum, London), original documentation for the ENIAC, EDVAC and SWAC, and models and modules from the UNIVAC I. In addition, this case contains original drawings of the ENIAC on loan from the Army Research Laboratory at Aberdeen and an original ENIAC vacuum tube on loan from the Museum of American History, Smithsonian Institution.



The third case displays models and artifacts of second and third generation computers, specifically models of the IBM 1401 and S/360 computers. The case also has a number of core memory samples and memory

planes, including one for the IBM 1401. This case also contains early microcomputers such as a Sol 1, and Apple II, a Timex-Sinclair, and it also contains a series of Intel microprocessors from the 8088 to the Pentium.



The fourth case focuses on programming languages, which is an area of my research. There are three shelves. The top shelf displays documentation for early languages such as the assembly language for the UNIVAC I. The second shelf displays documentation on the languages discussed at the History of Programming Languages Conference (HOPL) in 1978, such as ALGOL, APL, BASIC, COBOL and FORTRAN. The third shelf displays documentation for the languages represented at HOPL II Conference (1993) such as Ada, C, C++, Forth, Lisp, Pascal, Prolog and Smalltalk. I served on the Program Committee for this Conference and as the editor of the HOPL II proceedings. See Thomas J. Bergin and Richard G. Gibson, *History of Programming Languages*, Addison Wesley (1996, ACM Press).



The Museum also has one of the only working IBM 029 keypunches that I know of, and 6000 punch cards (most of which were scrounged from the University's computing center when they got rid of the punched card equipment). The 029 was donated by a retired

IBM systems engineer who needed more room in his basement.



The unit on the left is a model of a binary adder designed by George Stibitz of Bell Laboratories in 1937. The model was made by Raymon Richardson, a student in my History of Computing class some years ago.

In addition, three small tables house early microcomputers, software and associated documentation as well as a Frieden 130, the first electronic calculator made in the United States. The Frieden was donated by a company in Alexandria after an employee posted a note on a bulletin board which was seen by one of my university colleagues. In addition to the first “portable computer” the Osborne I, this display contains a Classic Mac (donated by my brother Michael), and a Radio Shack Model 1, donated by a young army physician stationed at Walter Reed Army Hospital in Washington, DC.

Web Presence

In addition to the physical Museum, a number of student projects have focused on putting the artifacts on the World Wide Web.

Computing History Museum, American University

The Museum’s home page is at www.computinghistorymuseum.org.

This page provides an overview and short history of the Museum, and contains links to the Museum’s projects:

Virtual Tour allows visitors to see photographs of some of the artifacts.

History of Programming Languages and Software Engineering Project

In the fall of 1998, the Museum received a two year grant from the Alfred E. Sloan Foundation in New

York. The purpose of the Sloan Project, as it is known, is to capture the history of programming languages and software engineering:

In 1996, the Alfred P. Sloan Foundation funded a proposal to establish HoTNET: A History of Technology Network. Sloan was concerned that technology was expanding so rapidly that historians would never capture the history of these technologies. The HotNET projects are exploring the use of web-base technologies to capture histories of selected recent technologies. At the present time, there are 20 active Sloan Projects.

The primary purpose of the History of Programming Languages and Software Engineering Project is to bring interested individuals together to participate in on-line discussions which, over time, might create new histories or modify existing histories on programming language and software engineering topics. It is hoped that in time, such discussions will result in publishable articles or serve as the basis for conferences on selected topics. A secondary purpose is to capture original documents, materials, and commentaries associated with specific programming languages and specific software engineering tools and techniques, as well as the evolution of programming languages and software engineering generally.

Teaching the History of Computing

Each spring semester, I teach a class in the History of Computing. Over the past two years, I have converted these lectures to Powerpoint® slides. In the summer of 1999, a team of students in a Web Site Design class put these slides on the web. The Sloan Grant was expanded in 2000 to allow the development of a site to support teachers wanting to teach a course in the history of computing. This site contains the syllabus for CSIS 550, the History of Computing (a 1 semester upper level course), the PowerPoint slides for this course, and annotated bibliographies of books, videos and web sites helpful in teaching the history of computing.

IEEE Annals of the History of Computing

I serve as the Editor-in-Chief of the *IEEE Annals of the History of Computing*, which is the archival journal for the history of computing field. This part of the site is reserved for members of the Editorial Board and contains materials about present procedures, the status of manuscripts in process, and a forum in which members can discuss issues of importance to the management of the *Annals*.

In Retrospect....

When Neal McChristy asked me to write something about the Museum, I thought it would take a page or two. Little did I realize all that has gone on -- all of the effort by colleagues and students -- at American University and elsewhere. As the reader can see, it has taken a long time for the Computing History Museum at American University to reach its present state. More importantly however, it has relied on the American University for its physical surroundings. It has taken the kindness of more than fifty generous donors to populate its displays and shelves. It has depended on the boundless energy and enthusiasm of a dozen students over the past 5 years, to make it a reality. For all of their efforts, I am most grateful.

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