

WITH UNIVAC IN PHILADELPHIA

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I Join the Eckert-Mauchly Computer Corporation

The Eckert-Mauchly job offer came through in November 1949, I believe, and I submitted my resignation to Admiral Robinson as of the end of the current term (mid-December). John Mauchly wanted me as soon as possible so I reported for work at the plant down on the Schuylkill River in Philadelphia on December 15th. I was employee #137, at \$7,500 a year. Although I didn't know it at the time, Eckert-Mauchly was ready to enter bankruptcy. Remington-Rand, an office machines and equipment company, had offered to take them over, assuming their liabilities and acquiring their know-how. This happened less than a month after I joined the company, and I found myself working for the Eckert-Mauchly Division of Remington Rand. Mr. Arthur Draper was appointed as our manager. Less than a week after I had reported for work, Grace Hopper told me she didn't want the responsibility of management, and had asked John to appoint me as head of the programming department, then consisting of four women who had worked as programmers on the ENIAC project, and Grace. Remington-Rand refused to accept the prices on the contracts with Nielson and Prudential, resulting in their cancellation, but the Government contracts had to be honored.

¹ Better entitled "Personal History of Herbert F. Mitchell, Jr., and Family History of the Mitchell Clan"

The first computer was to go to the Census Bureau for the 1950 census, and they wanted delivery as soon as possible. Nobody then realized that ASAP was to be April of 1951.

Director, Computational Analysis Laboratory

My first major task was to recruit and train a programming staff. Nobody then knew what qualifications a programmer should have, beyond the obvious ones of ability to think logically and be careful with details. But how do you measure such attributes? We looked in all the obvious places, and very quickly came up with 12-15 promising candidates, including my nephew, Morgan Huff. I enlisted all the existing programming staff to assist in the interviews, and required a near unanimous approval before hiring. We also needed a good secretary, and a non-glamorous married woman named Mildred Beibel was chosen. My experience in judging people's capabilities was entirely in the military, but our choices must have been good ones, as every person hired grew into being a capable programmer, some went on to achieve higher levels of responsibility. Art Draper reviewed our selections, and okayed everyone. As time went on we had to increase our staff, and this meant establishing levels of experience, responsibility, and pay. The programmers at first acted as their own operators when running their problems on the computer. The time soon came when we had to set up qualifications, job specs, and pay rates for operators as well, and then hire those needed.

I well remember the first programming assignment I gave the new group. It was the task I had done by hand back at Fort Bliss when I was paymaster for the 260th Cavalry Regiment — the denominated payroll — to determine how many bills and coins of each denomination are needed to pay a work force, knowing the pay each was to receive. The resulting programs revealed an amazing characteristic of the programming profession — no two programs were alike! Everyone did the job, but with widely differing time and memory space requirements. In fact, the fastest one took the most memory for the instructions, and the most compact program was the slowest! This established a principle that worked out far more often than not, the trade-off between speed of execution and memory space required. For many years, these two characteristics dominated computer design, as both were dramatically improved with each new advance in hardware. Univac I used a remarkable type of memory called an acoustic delay line. Each character was represented by a set of six ones or zeros (in 64 different combinations), and the string of zeros and ones was converted into a complex sound wave which was sent along a tube of mercury, being converted into electrical pulses at the far end, amplified, pulse-shaped, and reintroduced as sound waves into the mercury tube. Univac I had seven big tanks of mercury tubes, with capacity to "store" over 13,000 characters. These tanks alone cost over \$100,000, and compare with present-day's "chips" containing storage for over 16,000,000 characters each at a cost of a few dollars, not to mention that the chip is more than 1,000 times as fast!

After this first program had been squeezed for all we could get out of it, we proceeded to look at our customers' problems, and began to study ways and means of programming them. Our group became a resource group to produce programs for all kinds of demonstrations, and eventually formed the nucleus for the teams of programmers we "loaned" to our commercial

Established in 1980

customers to get their applications ready for use. Nearly every one of these first Univac programmers rose to the rank of senior programmer, with responsibility for large customer programming tasks. One of my projects to improve my programmers' understanding of the Univac I was to make a set of drawings, one for each register or other major computer component, each on a normal-sized sheet of paper and arranged so that they could be laid out in jigsaw fashion to represent the logical elements of the entire computer. I must have worked on this for six months or more, and I am convinced it helped my people to understand better how the computer functioned. Several years later I was amazed to see that the maintenance engineering organization had taken these drawings, reduced them in size, and made up a set of three large sheets as a primary tool for looking for trouble in the computer.

For most of 1950 we were at the development level. The first Univac I was under construction and test, and being the laboratory device it was, it underwent many changes and improvements as it developed. Its' availability to us programmers was catch as catch can, as the engineers always had first priority on its time. Many a programmer burned midnight oil to get his program on the computer so he could find out what was wrong with it, and eventually get it to run correctly. The Census Bureau also had its programming staff, and they too had to be given access to the computer. As the year progressed, it became painfully obvious how optimistic the early predictions of completion had been, and so there developed an air of constant emergency, as one setback after another kept delaying the acceptance test date.

Meanwhile, the office-machines-oriented marketing organization of Remington-Rand was trying to figure out what their company had acquired. At this time our division operated under the research and development group called the Norwalk Laboratories, under the direction of Lt. Gen. Leslie Groves, former head of the war-time Manhattan (atomic energy) Project. General Groves came to Philadelphia soon after acquisition, and turned out to be a rather pompous individual, who was not at all popular with our people. His deputy, Arthur Draper, however, was a smooth, almost suave, individual, and most of us got along fine with him. The Remington-Rand sales division was under Al Seares, who seemed to us as a typical sales type, full of talk but short on facts. As I got to know him later, I found a warm and honest person under his blustery exterior. Remington-Rand had a wide range of office products and equipment, from filing systems (the original Rand Company) to punch card equipment (the only competitor to IBM in this field) to electric razors to typewriters (the Remington contribution). Mr. Rand was president and, I believe, principal stockholder. He ran the company from his executive offices at Rockledge, just over the State line in Connecticut.

Active Duty for Korea

To keep my printers' union card current, I had transferred to the Philadelphia Inquirer, and dutifully put in my one day a month. General Hamilton had urged me to remain active in his New York National Guard brigade headquarters until after the summer training period at Cape Cod, Mass., as he was to be the senior brigadier there and would be in charge of all the troops in training. He had me practically rewrite the Army regulations concerning artillery

practice and field exercises, so as to enhance his prestige as commandant of troops, I suppose. As soon as the camp was over I put in my request for resignation, by reason of removal from the State of New York. Hostilities in Korea broke out in June, and the 102d AAA Brigade was in the first echelon of National Guard troops to be called into active service, before my request could be acted upon. Accordingly, on August 14th, 1950, I found myself once again at the Armory in Brooklyn, this time to prepare for another extended period of active duty and perhaps war service. I remember that my staff at Univac had draped the chair in my office with an American flag as a farewell gesture. I gave up my membership in the printers union at this time. Meanwhile the Army brass, recognizing that certain professionals were desperately needed in private industry, published the news that electronic engineers (among other professionals) could be released from active duty upon application of their companies or government agencies. Remington-Rand applied for my release, but nothing happened as we got ready to go to Fort Bliss, Texas, for training. History was surely repeating itself! At 4:45 PM on the afternoon preceding the departure of our personnel on a train early the following morning, a phone call came from First Army Headquarters saying that I had been deferred, and was to report to that HQ the following morning. I had already arranged for one of our junior officers to drive my car to El Paso, with my foot-locker in it, and he was several days on the way. I did get the foot-locker back some months later, but not the car nor any money for it. For the next two days I found myself at First Army HQ helping a master sergeant prepare orders to call up luckless inactive reservists to active duty. Then on the third day I got a call from Col. Robert Martin (another fellow officer from my old National Guard regiment, with whom I had attended the Coast Artillery School at Fort Monroe in 1937, and who now filled the place of Col. Linderer as special staff officer for National Guard and Reserve Affairs for First Army), asking me if I wanted to remain at my present work there in the HQ office until orders could be prepared to release me, or would I prefer to return to my civilian job. That choice was easy and I was back in Philadelphia the next day. It took over a month to create the regulations for releasing people like me, and my release came through effective October 12th, giving me two full months of active duty pay, much more than the \$450 I had lost to the Veterans Administration three years earlier!

Univac Is Accepted By Census

The major event in 1951 was the acceptance test for the Univac I. This was to be a grueling test to determine the ability of the computer to give an acceptable volume of work. A 20-minute module of computation was chosen, in which input data from tape was transformed and rewritten on output tapes, which became the input for the next module. Fifty of these modules had to be successfully completed in 33-1/3 hours, giving a long-range performance of 50% time efficiency. Jim McPherson (the Census project director), Dr. Alexander of the Bureau of Standards, and I (representing the manufacturer) were constituted as the acceptance test board. To understand the significance of the test, one must realize that no satisfactory recording medium for high volume data had as yet been developed. Univac had developed metal magnetic tape units called Uniservos, which were supposed to be able to transfer 10,000 characters a second to or from the computer, (compared to the 10-characters-per-second rate of the paper tape reader-punch of Mark II). Also, Univac was supposed to read from magnetic tape, compute on earlier read data, and write still earlier computed data,

all at the same time. These were revolutionary features, and needed to be validated by the acceptance test. The test was conducted in April. It ran quite smoothly for the first 16 hours or so, getting through more than half of the 20-minute modules. Then tape errors began to become more frequent and since an error would necessitate a restart of the module, our performance began to drop alarmingly. Finally, the engineers decided to take back the machine and realign the read-write heads on the Uniservos, which they did. This cured the problem and the test was successfully completed, with an hour or so to spare. Univac I was formally dedicated on June 14, 1951, by ceremonies at the plant attended by Mr. Rand (president of Remington-Rand), Dr. Peel (Director of the Census Bureau), Hon. Charles Sawyer (Secretary of Commerce), and other notables, including yours truly. Univac I was now in business! Census used this machine not only for the 1950 Census but for much other work as well, until it was retired near the end of the decade, eventually to take its place along with Lindbergh's Spirit of St. Louis and Apollo 11 in the Museum of Space and Science of the Smithsonian Institution in Washington.

The H-Bomb Calculation

The remainder of 1951 was busy with demonstrations, development projects, and customer programming assistance. The second and third Univac I's were delivered to the Army Air Comptroller and the Army Map Service. My programming staff had rapidly become professional; they were up to their ears in programming assignments. From time to time we were authorized to have additional staff, and I had my hands full trying to supervise all these activities and interview candidates as well. In early January 1952, Howard Aiken (my former professor from Harvard who had been hired as a consultant to the Atomic Energy Commission) appeared at our plant to say that he had recommended that the Univac be tried as a possible computer for AEC research computations. They had been desperately seeking computing time on just about every computer that was running, and had seven projects under way to build computers of their own. He arranged for us to try a sample computation, and gave me the data to begin programming. It was a formidable set of integral equations in time and space, and was absolutely the most complex computation I had ever seen or have seen since. We learned much later that the equations defined the explosion of a hydrogen bomb, and calculated its energy release!

Dr. Aiken arranged to get 14 days of time in late February from the Census Bureau, who had had charge of the #1 Univac since its acceptance, but had left it in our plant to avoid the delay to the 1950 census work that would be caused by the move and installation at Suitland, Md., its home for the next decade. I chose some of my best programmers, and we started feverishly to work preparing a program. We were given much too little time to do the programming, and we were into the second week of the 2-week period before the programs were even finished, let alone being checked out. As the second week began, Dr. Richtmeyer arrived from Los Alamos, with partial results previously obtained on the Bureau of Standards SEAC computer to use to determine the correctness of our results. On Wednesday, he announced that he had to return to Los Alamos, even though we had not been able to match the very first stage of the computation. He said he played second violin in an orchestra there; they were having a concert Thursday night that he had to attend. So off he went; H-Bomb

calculation or no! I was working nearly around the clock, and by Thursday conked out. When I felt refreshed enough to return late Friday, I was given the glad news that Dick Petersen had found the (hopefully) last bug, and we were matching the numbers left by Dr. Richtmeyer. All day Saturday the Univac faithfully ground out its calculations, and then about 9 pm Sunday night, just a few hours before Census was to take the computer back, the numbers exploded, and the calculation terminated. History had been made, and Univac's claim to be error-free in computation was established. Much later Dr. Richtmeyer told me he inadvertently ran the same set of data again on the Univac I that AEC purchased, and got exactly the same results in every number he checked, until he got tired of checking. My only claim to fame in this computation was the setting up of the problem to use the magnetic tapes as intermediate storage in an efficient manner — an absolute must in those days of very-small-memory machines.

The successful computation for the Atomic Energy Commission put us right out in front for computer acquisition by the AEC. Nearly all the AEC laboratories had an in-house computer construction program in being, using the prototype design created by Dr. John von Neumann. They were given interesting names: the ORACLE (Oak Ridge), the ILIAC (Illinois Institute), the MANIAC (for Dr. Metropolis at Los Alamos), and the JOHNIAC (for John Neumann at the Princeton Institute). But these could not handle all the work, so a Univac I was purchased by Los Alamos, two by the Livermore Atomic Research Laboratory (under Dr. Edward Teller, the "father" of the H-Bomb and my former Physics professor at George Washington Univ.), and one by the New York University Atomic Energy Project. The latter agency offered me a job as director of the computer lab at \$15,000 a year. When General Groves heard this he arranged for the leading engineers and myself to be put on employment contracts, and I got a \$6,000-a-year immediate boost, with \$1,000 a year raise guaranteed for the next five years.

The Los Alamos group, under Dr. Richtmyer, arranged to have me do some consulting for them on setting up new computations on their Univac I; so I found myself on a train bound for Santa Fe (New Mexico) with three of these scientists. They would grill me for an hour or so, and then ask me to leave their compartment, while they talked about the super-secret details of the problem. I would walk up and down the car aisle until they called me back for another session. We flew into Los Alamos on a small plane, and I stayed there several days, with little to do, until they decided they didn't need my input any more. I could have visited the plant in Albuquerque where the A-Bombs were being made, but turned it down. There are some things one is better off not knowing! Later that year I got "Q" clearance, so to be allowed in on the AEC secrets, but aside from one visit to the Princeton Institute for a discussion of the H-Bomb, I had no use for it.

Eisenhower's Election Landslide Predicted

In August or early September of 1952, Walter Cronkite of CBS approached Al Seares (Remington-Rand's VP for Sales) with the idea of having Univac predict the outcome of the forthcoming Presidential election. Our sales people jumped at the chance of this free publicity and persuaded Mr. Rand to provide an adequate budget. My programming staff was dedicated to the job of preparing the necessary programs, and Dr. Max Woodberry,

professor of statistics at the University of Pennsylvania, was hired as a consultant to provide the prediction techniques. Woodberry had studied all the previous national elections in US history, and had a good grasp of the requirements of the present effort. He soon had a goodly number of our people pounding desk calculators to compute all sorts of criteria data by which to measure the accuracy of returns from the polling places. There would be no time to print and proofread these numbers on election night. Even with these safeguards, we had some horrendous errors get through the system! We programmers were assigned tasks by Dr. Woodberry, without really understanding much of what we were supposed to be doing, but we worked around the clock on our individual runs, most of which didn't get checked out until just before election day. In fact, the integrated system passed its first okay checkout late that afternoon. CBS had brought its television crew to our Philadelphia plant several days before the Great Day. Their presence contributed to the confusion, as the engineers wanted to groom the computer and we wanted to test programs, while the TV engineers were trying to check out their set-up. CBS had also set up leased telephone lines from all over the country to pipe the data to us, with people at every polling place to input the returns data. They had provided us with three top-notch typists to record the data on magnetic tape with our new Unitypers — three as we had the computer compare the three inputs of each returns number, and accept it if any two or more agreed. Mr. Rand had had a special typewriter prepared with very large type, so the television camera could pick up the actual typing of the first prediction as the computer produced it.

All was finally in readiness about 8:30 election night, and we ran the first few returns into the computer. Jim McGarvey, our operator, apparently got upset by the knowledge that the entire nation was watching him on their TV's, and goofed up the type-out. Walter Cronkite immediately took the camera off the computer and ad-libbed until we got a print-out, which said that Eisenhower would win by more than 10-to-1. Since the pollsters had forecast a close election, and Woodberry had no reason to have confidence in the correctness of our programs, he decided that we had made an error in the determination of his trend factor. This was a statistical device by which he could predict the performance of States from which no returns had yet been received. Its calculated value was typed out as 10.1. Thinking our program must have made an error in decimal place, he had us replace the calculated value with the value 1.01, making Eisenhower still the leader, but just barely. This was the prediction which Cronkite gave to the TV audience. Before we could get another prediction, we noticed that the total vote being processed was jumping erratically, sometimes higher, sometimes lower than before. I immediately inquired of my programmers as to what changes in program had been made, and found one had been made -- a small change. I had him replace his changed program with the original one, and we once again had substantial and believable total returns. These were made the basis for a second prediction at about 10:30. Since the trend factor used was still 1.01 for States with no returns, the prediction was stronger for Eisenhower, but by no means a landslide. It was not until after midnight, when the populous West Coast States returns were in that the landslide was proved, as by now the trend factor had dropped out of the computation. Fortunately for us, a reporter from Associated Press had actually seen the early printout of the landslide prediction, and made that the feature of his news story the next day. For the next two years, Univac was in the news in one way or another all over the world as the computer nobody would believe! I had occasion several days later to type out the details of that first prediction, in terms of total vote

and Electoral College vote predicted. In all, Univac correctly predicted 44 of the 48 States from those one million plus early returns from only eight or so States. Of the four not correct, Tennessee was undecided for over two weeks, New York had an erroneous return for Stevenson of several million votes from a new precinct in the Bronx (which we could not screen), and the other two were very close. Since Dr. Woodberry was too busy to do so, John Mauchly wrote a paper for the American Statistical Society about the prediction techniques used. He had me actually write the final paper, although I can claim no credit for the contents.

Work in Philadelphia

Even before the formal acceptance of the Census Univac, work began on the construction of the other three contracted machines. This work was done in the original Eckert-Mauchly plant. However, as new orders began to be received (two from AEC in early 1952, for instance), it was obvious that a larger plant was needed. Such a place was located on Allegheny Avenue, about a mile from the first plant. Both plants were kept in operation until the first four machines had been delivered, and then the first plant was abandoned. The Allegheny plant had more of the aspects of a factory, and less of a laboratory, with a new personality, Phil Vincent, as plant manager. Among other new departments, an editorial department was created to produce the manuals, proposals, and other technical literature that was being demanded. Joe Chapline headed this department. Joe was not only a writer and a manager, he was an accomplished organist and choir director. He organized a choral society among the E-M Division employees and their spouses, among whom were Mary Charlotte and myself. I can remember three concerts that we gave — two of Handel's "Messiah" (first the abbreviated one, and second the entire work), and the third a collection of sacred music. I sang baritone, although before and since I considered my voice as a tenor. These concerts are among my most cherished memories. Not long after Remington-Rand acquired Eckert-Mauchly, the employees decided to form an association, a euphemism for union. Some of the leaders urged me to become vice-president. I was favorably considering it when Art Draper took me in hand and pointed out that I had to decide whether I was part of management or part of labor — I couldn't be both. That was rather a shock to me, but I realized that he was right, and declined the position.

Our little plant #1 became quite famous, judging by the rank of the people, both Government and private industry, that visited it. I can remember particularly showing the president of Metropolitan Insurance Company (largest in the US, which later bought two Univac I's) around the premises, and on another occasion we had the brass of the Navy there for a demonstration of how a computer could determine the raw materials to build a whole fleet of naval vessels. We were attracting the attention of major concerns (US Steel, General Electric, Westinghouse, Commonwealth Edison, John Hancock Insurance, and many others). IBM had not as yet shown any interest in using computers for business (although they were active in scientific and engineering applications), and were not at first any competition. Rather the hurdle was Mr. Rand's unwillingness to lease, and the price tag of \$495,000 he had put on the Univac I. The insurance companies, most of whom were forced to lease IBM punched card machines, were very much interested in purchase, as investment was a major

part of their business, and so most of our early commercial customers were insurance companies.

One of my principal functions was to prepare and present proposals to insurance executives as to how Univac could solve their data processing problems. Not only did this require me to learn the intricacies of the various forms of insurance (life, health, auto, home, group, etc.) but I also had to learn to describe these proposals in nontechnical (computer-wise) language, while using the technical terms of each business area involved. It was a very broadening experience for me, and I became increasingly grateful for Professor Ames at George Washington University for requiring me to take that public speaking course.

I was quite surprised one day to receive a telephone call from the company president, Mr. Rand. Why he called me, I do not know, but his word was that he wanted to make his yacht available to the senior staff of the Eckert-Mauchly Division for a six-day cruise, particularly to console Pres Eckert on the recent death of his wife. I immediately reported the invitation to John Mauchly, Pres Eckert, and Art Draper. Schedules were revised, engineers were notified, and a couple of weeks later about a dozen of us with our wives (except Pres's, of course) were sailing the Long Island Sound on the 125-foot yacht (one of two) that Mr. Rand used to impress (potential) customers. It was a delightful experience, and whetted our appetites for the better life that high-powered (and high-paid) executives can enjoy.

At about the time John Mauchly and Pres Eckert formed their company (1947), another company, Engineering Research Associates (ERA), was formed in Minneapolis. The group of engineers who formed the company had been involved with electronic development for the Navy during the war. ERA produced several drum computers for military applications between the years 1947 and 1952, leading to the design of a scientific electronic computer, known as the ERA 1103. A Washington stock broker named John Parker (a Naval Academy graduate), helped this company to obtain financial backing, and became its president. John came from a blue-ribbon New England family and claimed descent from Governor Bradford of the Plymouth Colony, also my forbear. That made John and me cousins of some astronomical number. I learned later that John had been the third room-mate at the Naval Academy with William Bullis (whose National Guard battery I had inherited) and Colonel Newman (who commanded the 61st AAA Group at Camp Haan, in which I was executive officer). It's a small world indeed! In 1952, ERA merged with Remington-Rand, and became a division much like the Eckert Mauchly Division. John was soon to become my boss, and introduce me to a style of living I had never known (and now don't want to know again!).

Transferred to New York City

In the spring of 1953, Remington-Rand's management decided to combine the two computer divisions under the name Univac Division, and to establish a sales organization for the two lines of computers within the company's sales department in its main offices in New York City. John Parker was chosen to head the computer sales group as a vice president of Remington-Rand thus my programming staff and I were moved to New York on July 1st. Luther Haar, was selected to be Mr. Parker's assistant sales manager. He was from an

aristocratic Philadelphia family and had been a punched-card systems salesman from the Philadelphia sales office (originally trained as an IBM punched-card-machine salesman). I was soon moved into the management team as the senior technical person in computer sales for business applications, and Irwin Tomash (from ERA) was designated as such for scientific computer sales. For the next three years we four were to be responsible for the sale of nearly 100 Univac I's, II's, and 1103's. Since nearly all of our 1103 customers were aerospace firms in Southern California, it was soon decided to have Irwin Tomash move to Los Angeles, and be a part of the LA sales office, being replaced by Graham Smith, a former ERA engineer from Minneapolis. John, Luther and I were left to woo Government agencies, business and industrial firms nationwide, get orders, train customer staffs, and help in the programming of the applications. Since the Allegheny Avenue plant in Philadelphia was not suitable for demonstrations to senior business executives, Mr. Rand authorized a Univac as a service bureau in our New York office, and later a second one as a service bureau in our Los Angeles office. As we grew in numbers of customers, so we grew in staff, at one time having more than two hundred programmers in our New York office, most of them working at customer sites. Luther took over the programming personnel that worked for customers, and I was responsible for those who supported the sales effort with demonstrations, and who manned the service bureau. Since Luther was a trained salesman and I was not, it seemed to me that our roles were reversed, but that's how it was.

The Big Apple

I must say I never did enjoy life in New York City. In the first place there were the trains. While we still lived in Wayne, I had to commute to New York. The Pennsylvania's main line ran through Paoli, just a few miles west of Wayne, where all the through trains from the Mid-West stopped. I bought a commutation ticket that enabled me to get aboard one of those trains in the early morning (some as early as 5am), and get to New York two hours or so later. But they were seldom on time. Their schedules were not set up for the commuter. When we moved to Norwalk, Conn., in November 1954, there was the commuter train to be taken from there. Once we sat for over an hour without moving in the yards above Grand Central Station. The railroads just weren't interested in moving people — no money in it. Then there were the crowds. We sales people on expense accounts never rode the subway! We rode in cabs. A cab cross-town could easily take more time than a pedestrian, as the north-south arteries blocked the east-west streets on nearly every green light. Then there was the noise, and the filth, and the rush. I'm sure Hell is going to be an enlarged New York City. Getting to the airport (La Guardia) was also difficult. The city built two terminals, locating each one far enough away from the subway lines that one was forced to take a cab after getting off the airport bus. The bus had to come through one of the tunnels into the city, and these tunnels were often jammed. Ever sit beneath the East River or Hudson River for 15 minutes or an hour in the fumes and heat? Once driving back into the city from a New Jersey camp where Will had spent several weeks, we crawled the two miles up the escarpment to go down into the Lincoln Tunnel from 8am to after 11!

Life in the Fast Lane

Our sales team of Parker, Harr and Mitchell traveled so much that it was hardly worth leaving Wayne. We were gone from the New York sales office from Monday until Friday, week after week, living in hotels, eating in restaurants. It was flattering to be admitted into the inner sanctums of the vice presidents of major corporations, and even occasionally meet the president. At one time I was on a first name basis with three US Steel vice presidents. But looking back on it, I cannot remember a single incident when something really worthwhile was accomplished. True we got business. Until 1955, IBM refused to enter the big computer market for business applications. Instead, they defensively protected their huge investment in punched-card machinery (leased only — at high prices), which included over 90% percent of all commercial businesses and over 97% of the US Government's data processing. But in 1955 IBM unveiled their 702, which was soon upgraded to the 705, and then we were in a battle for business. There is no question but that Thomas J. Watson was the greatest salesman America has produced. He had built IBM into a veritable giant of business machines — typewriters, accounting machines, and the 80-column punch card machines. His salesmen were trained in business procedures so well that many business executives allowed them to set up their whole way of handling their business data processing. The customer simply operated the machines and paid their rentals to IBM, and often had nobody with the capability of systems analysis. This was particularly true in the vast Government bureaucracy, both military and civilian. The people who were at middle management level could not function without the IBM account representative to tell them how to accommodate the new requirements that were constantly arising. There were exceptions to this situation, to be sure, else we in Remington-Rand could not have made our living. If a manager chose IBM and something went wrong, his boss would blame IBM. If the manager chose Remington-Rand and something went wrong, the manager would almost certainly get demoted, if not fired. To get a hearing for our computers we had to go to the top of the business or Government agency, where the sheer capability of these new machines made them attractive — even essential — to the organization. Parker well understood this, probably from his training in the brokerage industry. He had a reputation for straight talking and for delivering on his promises, and these were characteristics that richly paid off for Remington-Rand, as well as to invoke our confidence in our boss. I cannot recall Parker ever telling a customer or prospect a deliberate lie. There are not many people of whom I could make that statement!

Remington-Rand had an office building on the corner of 23rd Street and Madison Avenue. It was not the most fashionable part of town, but it was also not the worst. There was only one good hotel nearby, which catered to residents as well as transients; Luther Harr and his wife Eileen, who had no children, lived there. Mr. Parker had an uptown apartment, but made his permanent home in Washington, which he maintained even to the end of his life. John loved to entertain, and whenever we had VIP's come to our office from out of town, we would do the night clubs nearly every night. Everyone — I mean every man I ever met in business — drank cocktails before and often during meals. After all, alcohol removes the barriers to communication — until too much of it removes the communication itself. Parker and Luther had iron constitutions, and never showed the amount of liquor they might have consumed. I never bought a drink for myself, but I bought many of them for customer personnel, and

always had to join them myself, to be sociable. I remember one night when we had a group of US Steel executives from Pittsburgh (our first major commercial installation, US Steel's National Tube Division). We had finished a dinner in one of Third Avenue's most prestigious restaurants and Parker ordered a round of Drambuie — then a second — then a third — up to seven before the party broke up. In the cab back to Luther's hotel, John was talking about going to a nightclub for more drinks, but I wanted to call it quits, so feigned to have passed out. Luther knew it was feigned, but he had had enough also, so he convinced John that I had to be put to bed. I had one of my worst hangovers the next morning, but John was not fazed a bit. On another occasion I had to entertain some of these same Steel executives, who knew New York's night life much better than I did. I don't remember how many night clubs we went to at which I dutifully paid the tab, but I do recall getting to the hotel where Luther lived about 4:30 in the morning, only to be told that the room I had reserved and guaranteed had been given to someone else. The hotel clerk did give me a second-floor room, which he warned had been reserved for a meeting at 8am. When I was roused and evicted at 8, I had the biggest hangover ever, and all I could think of was to lie down again — but no room. So I went to the Harr's apartment and pled with Eileen to let me stay there that morning, until I could recover, which she very hesitatingly did. That was my last time for partying in New York, or anywhere else.

“Automatic” Programming

A number of the programmers on my Philadelphia staff resisted the move to New York, so a second programming staff was created in Philadelphia, under Grace Hopper, to produce automatic programming systems. I had been working on an assembly system which would use the regular Univac instructions, but with symbolic addresses, allowing much greater freedom in writing and changing programs. I added standard packages of instructions to control input and output operations and finally a feature to permit easy reruns of the program from an intermediate point, avoiding the restart from beginning of long computer runs. I coined the acronym BIOR (Business Input-Output-Rerun) for the program. Except for the rerun feature, the program was operational in 1955, and used by the Westinghouse Electric staff for all of their programs. However, a somewhat more sophisticated system was designed and produced by Grace Hopper's staff, and this became the official Univac program. Mr. Seares called it “Flowmatic”, of which the critics said it reminded them of a dishwasher. He had earlier added the word “Factronic” to Univac, a name that was immediately dropped at his retirement in 1956.

Editor's note: this story continues in Volume two.