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Waidner-Spahr Library
Dickinson College
P.O. Box 1773
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717-245-1399

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July 1, 1960 to June 30, 2000

A forty year journey as the technician of Physics and Astronomy at Dickinson College, as recalled by John W. Steigleman, Jr.

Working In the Instrument lab machine shop about 1980. Located in the northwest corner of the lower level of the Tome Scientific Building.

The following is part of an essay which I wrote about my entire work history. To summarize the time before working at Dickinson; I started at age 12 delivering newspapers, set up pins at a bowling alley, worked at various food service jobs, was a bellhop in a hotel, worked two summers in a shoe factory, spent one year as a manager trainee at F.W. Woolworths, worked in several local retail stores, got laid off, then worked at a number of temporary odd jobs while drawing unemployment. I was several months away from a planned wedding and I had no job prospects. It is now May,1960. I am almost 22 years of age. My future wife had a good job as a secretary at Dickinson College and we had already rented an apartment. What a dilemma!

On a Sunday evening while attending church, I was introduced to a Professor Henry Yeagley of Dickinson College by Blanch Baty, who was an elementary school teacher. Henry and his wife had come to visit at the invitation of Blanch and her sister Eva, also a teacher. Henry asked me the usual polite questions like where I worked and etc. Of course I told him that I had no permanent job. He already knew my fiancé who worked at Dickinson College. I did not attach any significance to this encounter until the next day. Henry called me at home that evening and asked if I would be interested in a job at the college. I asked what it was and he replied that it was difficult to describe, and could I come to the college for him to show me. I was interested and curious so went in the next evening. The Department of Physics and Astronomy had a small instrument shop with basic metal and wood working machinery. They had a part time machinist who they had wanted to work full time. The fellow already had a well paying full time position working as a maintenance machinist at Carlisle Tire and Rubber and would not make as much working full time at Dickinson. Professor Yeagley had already determined that I had taken enough science and math courses in high school to be qualified for the job. He explained that I would have no trouble learning everything that was needed for the job, which was generally to assist the professors with anything related to Science apparatus. Setting up equipment for student labs, lecture demonstration, repairing any broken instruments, helping to design and build research equipment, etc. This seemed a bit overwhelming, but Professor Yeagley assured me that I would not be expected to know everything right away. I was required to take the

basic Physics course at the college and to take adult education courses for the machining aspect of the job. The machinist, who was there part time, agreed to teach me the basics of running the metal lathe and milling machine. I needed to go in when he was there in the evenings and Saturdays. At that time the college had Saturday morning classes, so everyone who was employed there worked five and a half days a week for a total of 44 hours a week. My pay per hour was double what I made as a retail clerk. I would be getting $1.50 per hour. The minimum wage was 65 cents per hour in 1960.

Coincidentally, my wedding date was set for May 22, just a short time after starting at Dickinson. My future wife, Joan Mell, had been working at the college since High School graduation in 1956. She extended a general invitation to the folks she worked with and I think most of them came to the wedding. Some of the ladies helped with the reception, her boss, Al Walker, tape recorded the ceremony, the purchasing agent, Al Frankle, supplied the drinks, our new landlady, Flora George, supplied flowers from her family's greenhouse business and did all the arrangements at the church and the reception. The college president,Gilbert Malcom, showed up at the reception to congratulate us. The treasurer of the college, George Shuman, came with his wife. My boss, Henry Yeagley, was there with his wife Blanch. He told me to take the next few days off, even though I had not accrued any vacation time. My best man, Fred McLaughlin, and the head usher, Ken Bolze, gathered up all the gifts from the reception and deposited them on the landing outside our third floor apartment on West Louther Street, across the street from the campus. We didn't have far to go to get to our jobs. The point here is to show how friendly folks were at Dickinson in 1960.

When I sat down to begin writing, I realized that several things needed to be explained. With most people of my circumstances and upbringing, jobs were usually not something you did extensive planning for. I was focused locally and chose from what was available. When I was in high school, the job choices were either private sector or public sector jobs. Private sector jobs usually paid more, were not as secure and had only limited fringe benefits. Public sector jobs by contrast were usually fairly secure, not as well paid, but had more benefits. In any event, my job at Dickinson College slowly

evolved from being just another job to something different . Most jobs generate certain emotions, such as the easing of tension late on Friday as you anticipate the weekend and then that feeling of dread, late on Sunday as the weekend runs out. After very little time passed, I was no longer experiencing this phenomena. So it seems that I no longer thought of my “job” as just work. It became too interesting and absorbing to be considered just a Job. Before starting at the College I was part of the workaday culture where everything is rooted in the reality of needing to earn enough money to survive. common sense and practicality ruled the day. There wasn’t time to experiment. If something wasn’t of immediately profit or use it was discarded. Working at Dickinson was like a public sector job. Fairly secure, not too stressful, excellent health benefits, generous time off and eventually for me, a good retirement plan. As I mentioned before, the folks who worked there were several notches more pleasant than the general population. I spent the next 40 years there, from 1960 until 2000. Incidentally, The Tome Scientific Building had just been renovated and had a new Planetarium, a DC electrical system, a compressed air system, gas lines for the labs, all new lab furnishings and most importantly a new instrument shop. I was destined to age with the building. Just before retirement, I helped to design the shop area of a new building for the Department of Physics and Astronomy. When moving day came, the shop area was not finished, so I worked out of the empty building for a few months, then had to oversee the moving of the machinery, tools and the inventory of metal, plastic stock, wood stock and fasteners of all kinds. It required many days to arrange every thing in the new shop. After I vacated Tome, the interior was gutted and remodeling was begun. I retired, having spent only a few months in the new science building which eventually was named “The New Tome Science Building”. Old Tome became “The Stern Center”.

And now back to the beginning of the story. Dr. Yeagley had secured an agreement from the treasurer of the college, Dr. George Shuman ,that I would begin working for Dickinson on July 1, the first day of the fiscal year. Dr. Yeagley wanted me to begin immediately, May 1st, so that I wouldn't go elsewhere. He arranged for me to work on a research project, for which he had a grant, right there in the Physics Department. I was paid by Penn State which administered the money for the grant. My job immediately became the most interesting thing I had ever done. Henry had been working on several projects investigating the possible mechanisms by which migratory birds navigated. He had worked with ducks and homing pigeons in various field projects. At this time he had designed a lab experiment with pedigreed homing pigeons. There was an empty room in a back hallway, away from the class rooms and office areas of Tome Building, which contained a large 20 ft. square cage to house the pigeons, store their feed and a lab table with two specially modified "Skinner Boxes" which had been designed to do psychological experiments with birds. I spent some interesting time in the Psychology Department learning the techniques for training animals to work in the boxes, from a young professor named Don Moser. There was a compartment to contain the bird, with one wall that had two round buttons which were backlighted and were attached to small electrical switches. The idea was to illuminate the button and if the bird pecked at it, a light on the control panel lit up. Then a small food hopper in a hole in the center of the wall between the buttons could be opened remotely by a switch.. This was to reward the bird for a proper response to the stimulus of the lit button. These two boxes were constructed of wood rather them the usual metal Skinner boxes. There were coils of electrical wire on the outside of the bird compartment , attached to the top and bottom. The intent was to run D.C. Current through the wires to create a magnetic field inside the box. The main purpose of the experiment was to see if the bird could detect the magnetic field and react by pecking the buttons inside the box. I worked diligently to train Henry's pigeons to work in the boxes and to take care of their physical needs which included keeping the cage clean. I was the chief trainer, experimenter, technician and pigeon keeper. I also wired the

boxes' electrical systems and ran a cable to a control box with switches and lights on my desk in the basement, away from the pigeons. We did not want them to hear me throwing switches during the training and experiments. Their only clues were to be the lighted buttons and the magnetic field inside the boxes. I worked with 10 birds and discovered that two of them seemed to learn more quickly than the others. During the initial training , I placed a clip board in their cage that held two pieces of thin fiber board which sandwiched a piece of thin white paper between them. There were a series of holes drilled out the same size as the buttons in the box . Behind the paper was placed a small portion of grain. At first, a small tear was made in the paper of some of the holes so the bird could see the food. After a time they would peck open the paper to get the food. I then put a small red X on the holes which contained food and none in the unmarked holes. This was to train them to respond to something other than a lit button. The two aforementioned birds were more aggressive when the others and actually taught the others by example. They would do the red X buttons first and then do the others just in case. In the box training sessions it was hoped to have them respond only to the magnetic field. I thought that I was accomplishing this but discovered that the birds memorized the routine that I had carefully made as random as I could but was no match for them. Before I could refine the experiment, the grant money ran out and the deadline was reached. I should say that I was assigned the specific tasks and supervised by Henry Yeagley but was allowed to work on my own to train the birds and do the experiments, then reporting to Henry every few days to discuss any progress. Naturally I was very disappointed that the experiment ended with no results. It was determined some years later that migratory birds could indeed detect a magnetic field via a section in their brains which contain a small amount of a magnetic mineral.

July came and my job changed to that of learning in earnest, the fine points of machine shop theory and practice. I was suddenly aware that I was now my own immediate supervisor. It was mind bendingly difficult. My Grandfather, Bill Steigleman, had counseled me about working, at age 16, when I started my first full time job, working in a shoe factory. The gist of it was to do your assigned tasks to the best of your ability and to put in a full days work. Thinking was to be left to your boss. Now I was

expected to do my own thinking and assigning my own specific tasks. I read a lot of manuals and text books on machining and in the fall took an adult education machine shop course at Carlisle High School. I also enrolled in a college level Physical Science course which taught basic Physics and Astronomy in the first semester then basic Geology and Chemistry in the second semester. The second year, I took the freshman Physics course with the college students. After the basics were learned, I went on to add to my knowledge almost daily. This continued right up to the day that I retired. One of the most important things I learned when met with a challenging project, was to think outside the box.

The very first project that I worked on was already underway when I started. Dr. Howard Long was collaborating with a Biology professor on an investigation into the effects of nuclear radiation on mutations in a population of fruit flies. The idea was to expose the flies to neutron radiation and then to check each generation for mutations. Fruit flies had a short life span so any mutations would appear fairly quickly. My task was to build an apparatus which housed a radiation source and provided an area of containment for the flies. The source of radiation was five small cylinders of plutonium arranged in a circle in a brass holder. This was already built by the machinist who was there when I arrived. We worked together until the end of my first summer. When school started that fall, he left. During this time he trained me in the evenings and weekends when he worked. I also worked on the project on my own during my regular daytime schedule. My part of the construction was to machine the small containers for the fruit flies. The plutonium needed to be behind shielding to protect people from the intense radiation. This turned out to be ordinary paraffin wax. The containment vessel was a four foot diameter by 18 inches high doughnut shaped ring with the sources in a well in the center. Dick Hockley, my predecessor, had already constructed the vessel and it was up to me to fill it with paraffin. I went to every grocery store and hardware store in town to find enough wax for the job. I spent hours melting and pouring it into the vessel. When finished, it weighed about 400 pounds. I was also assigned the task of assisting the biology professor, Dr. Dan McDonald, when putting the flies into the apparatus. We needed to put them in using a three foot long handle to keep ourselves at a safe

distance. When in the room with the apparatus, we wore radiation dosimeters which were checked regularly to make sure we were not receiving too much radiation. The plutonium sources were also handled with three foot long tools. They were kept in a secure containment vessel and transferred by me to the experimental vessel each time the experiment was in progress. There was a lid to cover the source and the containers of flies during the experiment. It was also filled with paraffin. It was suspended by a rope on a pulley from the ceiling so it could be easily lifted and put down.The results of the experiment showed that radiation does cause mutations in fruit flies. The experience of participating in an actual scientific experiment was a real thrill and gave me a taste of things to come as long as I stayed at Dickinson. I checked out other employment opportunities through the years but nothing else would have come close to the satisfaction I experienced at Dickinson.

The next 40 years are a bit of a blur so the following stories will not be in any particular order but will be presented as they come out of my memory. The chain of events that led to my life's work seemed to have been unconnected but in the end all came together. I was never one to join the crowd and so thought of and did things independent of others. I enjoyed reading books about things that were out of the ordinary. There was a publication called "The Book of Knowledge" that my grandparents gave me as a gift one Christmas. It had been in their house and read by their children. There were facts about many subjects and served to awaken my interest in things scientific. About this same time my Uncle Carl Kerns took me under his wing and got me interested in building model airplanes. The upstairs spare room in the Kerns home was used by Carl and his brother Ivan for this purpose and contained a custom made table and storage benches built by a local cabinet maker. I was permitted to build my models there and spent many happy hours developing the expertise needed for making the quality models that were suitable for competition in model plane meets. These skills were to serve me later when building apparatus for the Department of Physics and Astronomy . The knowledge I gained working in a Hardware store was also a very important link in the chain of useful things needed to do the job. I frequently went to the hardware store to get what was needed to complete a project. Many other skills were

learned as needed for each new project. Among these were such diverse things as vacuum systems, optical devices including cameras, projectors, film processing, print making , using electronic instruments of all kinds, and various physics demonstration apparatus. In my fourth decade at Dickinson, I was forced into learning how to use a computer for the purpose of receiving messages from the professors concerning their needs for classes and labs. I resisted for a time but gave in and was not sorry to add this skill to my list. I used it to find and order materials that were not available locally, I learned to use a computer aided drawing program to make shop drawings which I usually made by hand on a mechanical drawing table. Drafting was another one of those acquired skills which I originally learned in a high school drafting course.

Foucault Pendulum

There were a number of ongoing projects which were a bit tedious at times but ultimately added to the unique nature of my work. One of which was the Foucault Pendulum hanging in the center of the main hallway of The Tome Scientific Building. It hung in a glass enclosed space in front of the Planetarium. During the school year and for special events taking place in the building, it was my job to make sure it was swinging. The driving mechanism was a bit touchy and malfunctioned frequently. I checked on it every morning on arrival at work and if it was not working to make it do so. The driving mechanism was at the top of the suspension cable, 30 feet up a series of ladders. It was a show piece for the department so was deemed important enough to use my time to keep it running. I also maintained the planetarium star and planet

projector and all the special effects projectors, some of which I had built. In this area in the vestibule was a weather station in a special enclosure which I designed and built to look like an old drop front desk. It contained a wind direction and speed meter and a barometric pressure recording machine all on display through clear sliding doors in the top section. The barometric paper chart needed to be changed each Monday morning.

Several other projects come to mind which made my job more interesting were concerned with air quality. Howard Long had received a grant for monitoring the amount of particulate matter in the air on the campus outside the Tome Scientific Building. After Howard ordered the instrument that was to be used, My job was to install it in a basement lab and to run a plastic pipe up the side of the building to monitor the air at a level several feet above the edge of the roof. Air was continuously drawn into the pipe and through the instrument to be sampled for particulates at one minute intervals. The sampling took place in a dark chamber with a flash lamp. The light reflected off the particles and was detected on a sensitive light detector. The resulting signal was recorded and averaged over a period of time electronically and read out by a continuous strip chart recorder. I was responsible for keeping the instrument calibrated and to change the chart paper at regular intervals for Howard to analyze . This was a several years long project. Some years later Howard and I were given recognition by the Clean Air Board for the project.

In March of 1979 the nuclear reactor at Three Mile Island on the Susquehanna River malfunctioned and released small amounts of radioactive particles into the atmosphere . I was listening to a radio while working in my shop when the announcement was made about the accident. I immediately went to the office of Professor John Luetzelschwab, who was the departments Nuclear Physicist, to tell him the news. Coincidently, John lived near the plant which he could see from his house. He and Priscilla Laws, another physicist, made immediate plans to drive to his home with a geiger counter to check for any radioactivity that might be present in the environment. They invited me to go along but I declined the invitation. Nothing of lasting consequence was detected, but they did get a scare when the instrument malfunctioned and seemed

to be detecting high levels of radiation. Fortunately, John was able to interpret that the readings they were getting were caused by a low battery condition. We were about 25 miles from the scene so I was not greatly concerned, having learned enough about radiation from working in the Physics Department for the previous 13 years. During this time I had handled radioactive materials and was familiar enough to know of the possible dangers and of the precautions to be taken. There were a number of people at the college who panicked and left for a while until the facts were known. After the incident was over and taken care of, a citizens group was formed which won a law suit in Federal court. They were given an amount of money to organize a monitoring system to be paid for by the company which owned and operated TMI. John Luetzelschwab became a consultant to the group.When they received the instruments for monitoring, locations were chosen at five places within a few miles of the reactor. John recruited a group of college students to go out once a week to pick up two different types of filters contained in each unit. These were taken to a lab to check for radiation activity. I was engaged to take in each unit for rebuilding and recalibration every six months. In order to accomplish this, I spent a day at TMI to be trained by the technician who maintained the same units the company used for self monitoring. I had been on a tour of the facility a few years before with a group of students and was treated to another tour by the technician before the training session. On the first tour I remember looking down into a deep pool of water in which was stored the spent fuel rods. They had to be stored on site because there was no place to take them for permanent disposal. The pool construction consisted of a shell of thick stainless steel and concrete, filled with 50 feet of water over it and open at the top. The water had to be kept cool as the fuel still generated heat and would for hundreds of years. There was a walkway around the periphery with railings. An eerie green glow could be seen everywhere when peering down into the pool. On the second visit with the technician I was taken into the generator building. The size of the generator was as impressive as the size of the spent fuel rod pool. The technician , Bob Baker, was a retired Navy Nuclear Tech who had served aboard a Nuclear Submarine. I spent the rest of the day watching and learning as he did a routine rebuild of the air sampling unit of the type I would be working on. Now back to the description of my daily activities.

Since I was the first one in, It fell to me to unlock the building each morning and to brew the coffee for the department. Most mornings I set up demonstrations for the General Physics courses and prepared either a slide projector or movie projector for use as needed. All this in the first hour of the day. Then it was off to my desk to check for any messages. Before computers there were paper notes on my desk, after computers I checked e-mail. There was a table in my office where student lab assistants would place any apparatus that had been broken in lab the day before. If there was no immediate need for them, I put them aside to be worked on in the summer when I wasn't busy with setting up for classes and labs. If there was a need, I repaired the item and returned it to the lab. I sometimes took a break and went to the Althouse Science Building to have coffee with the technicians in the Chemistry and Geology Departments. More often than not I was there to obtain chemicals or glassware which were given gratis. I returned the favor by repairing any of their broken apparatus as needed. I also reciprocated with the Biology Department. We had an occasional need for distilled water or alcohol which they always kept in stock.

Managing my time was an ongoing challenge. With the help and cooperation of the individual professors, we instituted a priority system and set limits on the types of things that I did. I persuaded them to eliminate things that could be considered errands. Top of the list were demos and lab set ups for which the profs gave me a list at the beginning of each semester. Second was anything for scheduled classes not on a list. Anything that had to do with the students was always considered paramount. Faculty research was unfortunately at the bottom of the list. I say unfortunately because these were the things I liked doing best.

Next on my list of favorite things was working on student projects which were sometimes a bit over the wall and required much thought and collaboration with the students. One in particular was an investigation into determining the optimum angle of the blades in a wind mill. The student, Joel Schwendemen and I worked together

building the apparatus, which we mounted on the back of a small pickup truck. The blades were about 2 feet long, the shaft was rigged up to a small electrical generator so that we had a way to measure the output. The method was to drive the whole rig on a straight level road at a constant speed, then read the output of the generator. The angle of the blades was changed then another run was made. We had picked an empty country road that had at least a few hundred feet of straight level road. When we stopped to change the blade angle, a farmer in a pickup truck stopped to ask what we were doing. It was a little strange to see a small wind mill on the back of a truck whirling around as we drove along. We were almost finished and had determined the best angle when I said,“why don’t we speed up and see what this baby can do?” The blades were spinning fast enough to act like a gyroscope. We came to the end of the straight section of the road to a slight curve and heard a loud bang from the back of the truck and saw two of the four blades go flying off into the field beside the road. We determined later that when we came to the turn, the blades were spinning so fast that their inertia resisted the change of direction and overstressed the blade shaft which tore itself loose from the hub in which it was mounted. We only found one of the blades and wondered what the farmer would think when he later that summer mowed the hayfield. A few years later we had Joel come back to Dickinson to give a lecture about his path from Dickinson to his job at a drug company to illustrate the value of Dickinson’s Liberal Arts education. He talked about his senior project and at the end of the lecture we presented him with the surviving windmill blade.

Another memorable student experiment was to investigate what effect dimples on the surface of a golf ball had on it’s flight characteristics. This was the senior project of Christine Dugan. We purchased some Bocci balls, one of which we dimpled and one was left plain. They were suspended from a support rod by thin nylon string. We had no wind tunnel so mounted it up through the sun roof of Christine’s car. We used the same stretch of road used for the windmill experiment. The method was to measure the angle of deflection of the bocci ball pendulums as the car was driven at a steady speed. It was found that there was slightly less wind resistance on the dimpled ball. Christine and I joked about whether dimpling the surface of her car would cause less wind resistance.

Knowing Christine's inquiring nature, I wonder if at some time she may have actually tried it p!

Mickey MacDonald and a lab partner, whose name I can't remember, spent a semester designing and helping me to build an apparatus for the Nuclear physics lab to measure an angular difference in radiation flux density of a small radiation source. The source was suspended above the center of a four foot diameter table. Two sodium iodide detectors were aimed at the source and were mounted on carts, each of which was pivoted at the center on the table top. The carts were motorized and controlled by a timer to be moved at specific times. The angle between the carts was also changed periodically. The idea was to detect a burst of radiation at one detector and to look at the reading on the other detector at the same time. I was not too clear to me about the exact purpose of the experiment but knew enough about it to build what was needed.

It was exciting and pleasurable to work with the students and professors and knowing also that I was contributing to their education. I did not have a clear idea of this aspect of my work until years later at my retirement dinner. One of the alumni who spoke, thanked me, explaining that when he went to work on the space program, he knew more about the work that could be done in a shop that built science apparatus and instruments than most of his colleagues. This gave him a distinct advantage in dealing with the folks who built the apparatus. All those years I had no idea this was so because I gave no exams or otherwise graded the students. I had no way to know what they had learned from me. They were of course graded by their professors but no feedback was available to me.

A similar but different project took place about twenty years later. Two physics students studied abroad in England during their junior year and worked with an apparatus called a "Positron Accelerator". When they returned to Dickinson for the senior year they asked for permission to continue the experiment for their senior project. Unfortunately we did not have the apparatus for the experiment and to top it off, none of our professors knew much about the phenomena. They were able to convince the

Physics Department that an apparatus could be built and that Professor John Leutzelschwabb , a nuclear physicist, was knowledgeable enough to be their advisor. Shawn LaShell and his partner met with me to plan the construction of the equipment needed for the experiment. They made some conceptual drawings from which I made the working drawings. They also made a time line for me to follow so that they would have time to do the experiment and write up their report by the end of school term. I then ordered all the parts needed. The apparatus consisted of a T shaped aluminum vacuum chamber. The bottom of the T contained a diffusion pump and an outlet going to the roughing pump. The T was made from six inch aluminum pipe with 1/2 inch thick walls. A pair of aluminum discs were machined to fit on the end. One was welded to the T and open in the center. The other one was fitted with feed through electrical connectors. An O ring seal was machined into the surface to make a vacuum tight seal when the two were bolted together. The other branch of the T also had a disc welded onto it. This was open in the center as was a similar disc welded to a two foot long section of aluminum pipe. It had a disc on the other end, welded on and open in the center. This section of pipe was wound with several layers of electrical wire to provide a magnetic field, when a DC current flowed through it. An end plate was then machined and outfitted with a holder for the radiation source that was to supply the Positrons for the experiment. An electrical harness was fabricated to supply an accelerating voltage for the positrons and for the detector at the opposite end of the system. A power supply was wired to the coils wound on the source section of the system. The detection plate was connected to a sensitive electronic meter for measuring the voltage generated when a beam of positrons was present. The first thing to check on such a system is for possible air leaks. A few were found which were easily fixed by coating the outside wall where they occurred with a special vacuum epoxy. The whole system was supported by an aluminum frame to minimize any distortion on the magnetic field. We fired up the vacuum system, having already installed the radiation source. I do not remember the isotope that was used but it had a relatively short half life of about 30 days. After verifying that the vacuum was at the required pressure, the other electronics were turned on. Lo and behold, the experimental values they expected were showing on the meters, so the students decided to go ahead with the experiment. They were able to do

their report in record time. That was the only project that I ever worked on that did not require a lot of tweaking. The only glitch was that when I read the bound and published report, a year after the students had graduated, there was no credit given for my part in the project. The Professor, of course, was mentioned even though his only involvement was to agree to be their official advisor. I was nevertheless proud to have had a part in it. Shawn went on to teaching college level Physics in Turkey.

Energy conservation became a subject of interest in the late 60's and solar energy in particular was investigated. We built several versions of passive solar collectors for mounting in a window. The students helped design and build them of materials that could be bought at your local hardware and lumber stores. We used plywood for the shell, corrugated metal roofing sheets for the collector surface, foam insulation for the lining, and flat black paint for the collecting surfaces. The only specialty item was the material for the cover, which was a semi clear plastic sheeting made specifically for solar collector covers. Vivian Garcia Arnold was a senior then and used the collector for her senior project. We got permission to mount the finished collector in the department office window to test it. When the sun was out it provided more heat than was needed. At night it needed to be closed off to prevent cooling effects. The conclusion was that some form of heat storage was needed for the times when the sun wasn't shining. That was to be a future project that I do not think was ever done. Vivian went on from Dickinson to a career in civil engineering.

Professor Ken Laws taught a course that he called Experimental Physics with stress on the use of "hands on" experimentation. He thought it would be useful for the students to know how things were built. At his urging, I developed a short machining project which was partly observing and partly doing some machining. This was closely supervised so that no one would be injured or damage the machinery. I gave a one hour long introductory lecture then another hour in the shop showing small groups of students how the machinery worked. Then we scheduled each student for multiple sessions of hands on machining. The only problem was that this part of the course was not in the description of the course. The time spent with me was extra and put a burden

on the students to find time in their schedules. Ken wasn't willing to give up any of the time he had scheduled for class and Lab, so we only did it for several years. One problem was, I suspect, that my part of the course was not perceived as academic. The students who were in these courses came back after leaving Dickinson and told me that they had a distinct advantage over their contemporaries in graduate school, who had never experienced any actual hands on building of apparatus or had not even seen a machine shop. Goes to show one that a mixture of academic and practical application is really needed to have a well rounded education. It seems to me that Liberal Arts needs to be expanded to Liberal Arts and Crafts.

Ken Laws also developed an interest in the "Physics of Ballet" which was triggered by watching his young daughter at her ballet lessons and in his mind wondering if there were optimum ways to perform the moves required of a dancer. He had heard of the research done by the Russians for Olympic athletes. He devised ways to measure what was happening during the performance of movements by an experienced ballet dancer. I built a four foot diameter platform, mounted on a turntable bearing. We used various sensors, a video recorder, and an oscilloscope to measure speeds of rotation versus arm and leg positions throughout the performance of various turns performed by the ballerina in the center of the platform. It would rotate when she moved and required someone to standby ready to catch her if she lost her balance. This was my job along with adjusting and setting up all the systems and instruments. He also had taken ballet lessons so he could experience what was happening and to develop strategies for improving the movements. Ken went on to write a book about the physics involved in ballet movements.

There were the inevitable difficult projects which kept the job interesting if not occasionally frustrating. The most recent was the move from the old to the new building. At the beginning was the process of working with the architects. I was asked by the Department to do a general workup of a shop space to include sufficient space for all the machinery we already had and to provide for new additions. In Tome everything was in one room. In the new space we wanted to separate the metal working machines from

the wood working machines. The intent was to have an office located between a wood shop and the metal shop. There was to be a separate room for working on electronic and electrical projects. The profs planned their office and lab spaces and a lecture hall with storage for equipment needed for demonstrations. This preliminary planning was reviewed by the architects then they proposed modifications based on how much space that would fit the amount of money available. We were advised to cut down our proposed space by 10%. After much thought, I combined the office and electronic work area into one room. The rest of the department made similar changes. Then came the planning of utility needs. In my case it was the electrical needs for the machinery. The specs were taken off the motors and listed on the drawing of the space proposed by the architects along with location for each machine. This was all combined into a final set of blueprints and put out for bids. The architects electrical engineer had come to see me to double check the specs and I assumed that my job was done. Not so! During the building phase, I visited the job site regularly and at some point was talking to the chief electrician during the wiring of the shop. I noticed that there did not seem to be enough wires in the rough in boxes for the 3 phase outlets for the machinery. The electrician took out the plans and showed me that no 3 phase was to be installed. To make a long story short, the architect would not take responsibility claiming that it was up to us to check the specs on the drawings before they were put out for bids. The college ended up paying for the modifications.

The building was a little behind schedule but the Profs and their things were packed up and moved over in time to start in September. The shop area in the new building had been used by the contractors for various things so it was decided to delay moving me and my shop until last. I worked out of old Tome and floated back and forth between the buildings.

Then when it came time for me to be moved, I went in early in the morning to oversee the process. It took four hard working men all day to just move the machinery and put it in place in the new shop. The man provided by the college to oversee the whole project from construction, to furnishing and moving everything showed up late in

the day to see how it was progressing. It was now 8:00 PM and the moving crew had not even started to move a couple of tons of boxed tools and machine parts or the the contents of the stock room. It seems that their boss didn't take into account the difficulty encountered when moving the machinery through narrow stairways out of the basement of Tome. The foreman of the crew said that they did not have enough time to finish the move and could not come back the next day because of another scheduled job. Our man, "Big Bill" , let them go and told me that he would arrange to finish the move. It turned out that his budget was depleted by revisions requested by a few professors after the contract was finalized, and adding in the debacle with the wiring. He then couldn't persuade the college to use their men to move me. They told me that they were not going to cover his mistakes in judgment. I ended up moving the rest with the help of the technicians from Geology (Mark Kauffman) and Biology (Harold Lott). It took three long hard days to accomplish the move. We were given the use of a truck furnished by the college for moving the 12 foot long pieces of metal stock and the metal storage rack. We used Harolds pickup truck for moving the boxes of tools and parts. Harold also helped me to assemble the machinery and storage cabinets. The Department paid Harold for his time and the use of his truck. This had not been my first unpleasant encounter with an architect.

Dr. Henry Yeagley had planned to have a multiple telescope observatory and went out to find donors for the project. He had already successfully built a Planetarium with funds from a grant from a Dickinson Alumnus named Roscoe Bonisteel. He also was persuaded to fund the observatory. Henry wanted it to be located on Campus and somehow convinced College officials to let him use the roof of the Althouse Chemistry Building. The roof was to be opened up and replaced with a sliding roof. The side walls of the space had to be low enough to point the telescopes as close to the horizon as possible but high enough so that the lights from the campus would not shine in the eyes when looking in the eyepiece. The telescopes were to be placed on 18 inch high concrete bases equipped with leveling feet. There were also two beams left in place after the roof was removed therefore there would be three spaces for three telescopes. Henry devised a scheme to pad the beams so no one would bump their heads while

moving from one space to the other. I was asked to make a mockup of one space with a wooden frame. The width of the roof top opening was known as was the length, so the frame was built to those dimensions. The room in Tome where we built the mock opening had a rather low ceiling so we placed the telescope on the floor.We swung the telescope to the angles required for viewing and adjusted the height as required. After the dimensions were set we met with the architect to show him our mockup. I attached a note to the frame to remind us that the height of the walls should be 18 inches higher than the mock wall since we did not have the 18 inch base. He measured all the dimensions then went off to make the final plans.

A substantial steel frame was fabricated under the opening on which was placed slabs of concrete for the floor. I was charged by Henry to visit the work site each day to observe the progress. I usually went there late in the afternoon after the construction crew left for the day. The first thing I noticed was that the two cross beams were there originally to hold up the roof. Since it was going to be replaced with a sliding roof, I thought that they probably could be removed. Otherwise we would be bumping our heads moving from one section to another. Henry and I took a close look and called the architect who said he would have to do an engineering study. They were removed the beams the next day! That afternoon after the crew left, I took a close look at the steel framing and discovered that the floor was going to be 18 inches too high. Score another major goof by the architects. He weaseled out of it by quoting the old standard architect's excuse " You needed to check the drawings and specs before approving them" By now it was too late to change because the steel had been prefabricated as per the drawings and already welded in place. Later when the major construction was done, I spent a large chunk of time fabricating panels to shield the eyes from the campus lights and mounting them outside the tracks for the sliding roof. The design of the concrete bases was also not well done. First, they were 18 inches high, the adjustable legs were not easy to access with an ordinary wrench and there were four instead of the more common three for this kind of application. The hold down bolts for the telescope base were cast into the concrete and were not well located. We were forced to designed and build our own lower concrete bases. Henry had a unique plan for the floor to

minimize the vibrations generated from walking around in the observatory. Even small vibrations are magnified when looking through the eyepiece of a scope. A thick layer of felt was glued on the flat side of a 2 x 8. It was laid on its side on the concrete slab, then another layer of felt was glued to the top side. These were spaced at two foot intervals.. A 3/4 inch plywood sheet was then loosely screwed on top. Holes were cut out where the telescope bases were located. Then carpeting was installed. With the cross beams removed we had space for more telescopes. Six Newtonian telescopes were ordered, assembled, put in place, oriented and adjusted for latitude. The architect had also neglected the proper placement of electrical outlets to power the driving mechanisms of the scopes. We had to do an unconventional workaround to accomplish this. There were outlets on the wall which would have required an extension cord stretching from the wall to the scopes located in the center of the floor. This was an obvious tripping hazard. We drilled holes in the wood floor under the outlets and strung the cables in the spaces between the 2 x 10s under the deck.

The observatory was used not only for the Astronomy courses at the college but also was open to the public for a time. It was staffed by volunteers from a local amateur astronomy club. I was assigned the task of checking the weather forecast for the evenings it was to be open and then leaving a message on an answering phone. This was before weather satellites and cable TV. I called the weather service to get their estimate of cloud cover then recorded the appropriate message. Some of the Newtonian scopes were replaced after Henry retired with scopes capable of more accurate tracking, with greater magnification, were camera ready and equipped with filters for viewing the sun.

I recall with a great deal of pride that I was able to assist Henry in building and running the observatory. Most of the grunt work, carrying everything up from street level to the attic of Althouse, was accomplished without help. All the lumber that we ordered was delivered to the side door of the building late one afternoon. I had no way of getting any help that late in the day, so I spent two very exhausting hours carrying sixteen 10 foot 2 x 10s; 8 3/4 inch thick, 4 foot by 8 foot panels of plywood and other miscellaneous

items into the building and up to the attic of this three story high building. I also worked alone when cutting and installing the floor, setting up the telescopes and so on.

After everything was up and running, Henry decided that the Newtonian Telescopes were not working as well as he thought they should, so he started experimenting with alterations to improve their performance. It would take a whole book to go into the details so here is a summary. After thinking of an alteration, Henry would have me build six, one for each telescope. I would order the materials, get part of the way through fabrication, when Henry thought of an improvement. Typically, I would have to scrap everything and start over. After more than a few of these episodes, I suggested that we should build one and see if it would work before making six. Henry was so intent on improvements that he saw my scheme as a less efficient way to get it done. I had to remind him that he was taking so much of my time that I was not able to get my work done for the rest of the Department. I had by this time gotten complaints from the other professors. So Henry, being an accomplished machinist, started to come into the shop after I had gone for the day and did the alterations himself. As I remember it, each of the six telescopes had something different from the others and none of them performed as well after the alterations. He had bought these particular scopes, because they were simply designed and relatively inexpensive. They did work satisfactorily at first but not up to Henry's expectations.

When the observatory was finished and being used, I periodically went up at night to check that the scopes were still oriented and tracking properly and to keep the finder scopes aligned with the main scope.The students were notoriously clumsy when using the scopes and frequently bumped into them in the dark.

The light shield panels we had to install presented a problem when it snowed. The snow collected between the slanted panels and the roof track would sometimes freeze so that the roof would not open. The motor that operated the roof was programmed to automatically stop when fully open or fully closed. The gear that operated the roof slipped on it's shaft when the roof was stuck because of the ice jam

and would get out of adjustment so that it had to be repositioned. Before we knew this was happening, the roof gear ran off the end of the rack gear and dropped down about a half inch. This happened one night when a lab session ended. Putting it back together again in the dark sure was more than a little aggravating.The only way to prevent the problem was to remove the snow before it froze.The method I used was to open the roof just enough to shovel out a few feet of track then repeat until it was fully open. It seemed that a technician's work was never done!

After Henry retired, the Department hired Scott Smith to be our Astronomer. Scott had some experience with Planetarium shows and involved me in adding some special effects projectors. A shelf was installed under the edge of the planetarium dome to support the new projectors. We discovered a source of small simple slide projectors, which we used as the base for building some quite clever special effects. The most interesting and challenging effect to achieve was a meteor shower projector. It included two specially patterned photographic slides.They were placed next to one another, mounted in small ball bearing rings. They were attached to pulleys and counter rotated to achieve the effect. Another was an exploding bolide projector which included a moving mirror to project the image of a moving, glowing meteor combined with a flash bulb to simulate the explosion at the end of it's flight track. One summer, when Scott was on sabbatical leave, a student named Paul Kanev and I did some work to improve the performance of the Planetarium machine and to paint the dome. We also built a projector to simulate a snow storm to use with Christmas and winter shows. Paul was from Philadelphia and had worked at the Fels Planetarium while in high school. Paul eventually became a Neurosurgeon. When the new planetarium in the new building was finished, the old machine in Tome was abandoned. Paul requested and received the old machine. His intent was to build his own planetarium and to refurbish the old machine as a hobby.The last I heard was that he never arranged to have it shipped from the college storage facility. I suspect he was too busy with his professional activities to have a hobby. He did however make a sizable donation for the Planetarium projector in the new Tome building which he did in his father's name.

That fall an interim Astronomy professor named William Deutschman came on board. He and I designed and I built a projector to show an object moving about in the sky. It was a mirror that was pivoted on two axes, mounted in front of a projector, and controlled by a joy stick. Bill wrote up a description of it and submitted it to a magazine for planetarium directors. I was gratified that he gave me credit as a collaborator. The Planetarium shows were becoming more than just a star show so we determined that a control panel was needed. Bill and I devised a simple multi-switch panel with a few commercial dimmers and a bank of receptacles. I'm sure that it probably would't pass an electrical inspection today but it was adequate for our needs at the time. It was inexpensive to build and did not require much electrical current to run. Since we only used one special effect at a time, one was turned off before another was turned on so that there could not be an overloaded circuit.

The new planetarium in the new building included a video projector which made it easier to show pictures which were previously shown with slide projectors. The astronomy profs had hundreds if not thousands of slides which now were obsolete. The cove around the edge of the dome in the old planetarium was back lit with red and blue lights which could be dimmed. There was a simulated horizon in front of the lights which looked like buildings, houses, trees and, etc. The buildings were typical of the area in and around Carlisle. There were outlines of the three college buildings on the main campus (Old West, Tome, and South College) There was even an out line of the mermaid weathervane mounted on top of Old West.There was a one room school house with an outhouse beside it and a few groups of of farm buildings. This was all in place around the diameter of a 30 foot dome. The design was the creation of the artist in residence at the college, John Drake Pusey, who had worked on the model of the Normandy beach, which was used for planning the invasion during World War Two. The design was transferred onto thin fiberboard which could be bent when fastened to the curve of the planetarium dome. It was carefully cut out and installed by the carpenters employed by the college. Unfortunately, It was to be left in Tome and would have been lost if I had not personally insisted that it be carefully removed and reinstalled in the new

planetarium. It was to be one of the last things I accomplished before retiring. The new planetarium was a bit larger than the old one, so a section of cove was needed to fill in. My replacement, Rick Lindsey, very ably made an outline of the mountains to the north of Carlisle and mounted it in the blank space. Rick had been working at a local industrial plant that manufactured small electric motors. The plant was closing about the time I planned to retire so things worked out well for the college and Rick. He was an experienced maintenance machinist and mechanic. It turned out that he also was creative and learned new things easily. He attended the Elementary Physics classes to get up to speed for his job. I visited with Rick from time to time and was constantly impressed with the work he was doing. Unfortunately he came down with a disease that took him after only 12 years at the college.

Now back to my random ramblings. I was amazed at how well I was treated by the professors, most of whom I considered as friends. Since I did not make much money, some of them gave me work to do at their homes to help me make ends meet. I did a few odd jobs for Richard Sia at his home on Baltimore Street and on several occasions took him to and from the airport when he traveled. He was always more than generous. Before coming to America he was the Head Master at a private school in China. His family was wealthy and he told me once that he had enough money without depending on his pay at the school. He was constantly being reminded by the financial officer to cash his paychecks so that the books could be balanced. He had two sons and two daughters. When he applied to the communist regime in China for travel permits to go to America for further education, he had to leave some family behind to assure his return. His oldest son volunteered to stay, and after much soul searching and reassurance from the son that he would be all right, he left, never to return or ever to hear from his son. The other son attended high school in Carlisle as did the two daughters. The son and one daughter attended college. The son went on to a professional career of some kind and the daughter became a language teacher at the local high school. Unfortunately the other daughter developed mental problems and after a long struggle committed suicide. His wife, who was a piano teacher, had died from a kidney disease. Some time afterward he contracted cancer. He traveled to

California where he had some relatives to be with while he underwent treatments and spent time at a nursing home to recover. One of his nurses was an older woman whom he ended up marrying. He moved back to Carlisle into his home here. His school teacher daughter never married and still lived at home. His new wife, named Doris, moved some of her belongings from California. Her son brought them East in a rented van. I helped him unload the van, partly at Richards house and some into storage. She stayed for a few years and the last that I heard, moved back to California. I lost track after that but do know that he died in a local nursing home after a long illness. His daughter stayed in the family home until she retired, then moved to California to be with her family.

Howard Long was at the college, one year before I arrived. He had had been teaching Physics at Gettysburg College and was hired to be the future Department chairman. Henry Yeagley wanted to step down as chairman as soon as he could after organizing the Department. He had been at Penn State University and was enticed by the Dickinson College President ,William Edell, to come to Dickinson to develop the Department of Physics and Astronomy. He was given a generous budget to rebuild Tome Building, hire professors, purchase apparatus, build a planetarium and at Henry's insistence put in a small machine shop for building experimental apparatus. He also hired a retired high school machine shop teacher, Scott Anderson, to work in it. The machinist promptly was assigned the task of building a Foucault Pendulum with a 12 inch diameter lead ball, a 30 foot long support cable, and a magnetic drive mechanism at the top. I've already written about this earlier in the essay. Henry and Scott did not get along well. Scott was a seasoned machinist who did things in a conventional manner, while Henry, being an imaginative soul, tended to do some unconventional things on occasion. I've already described this tendency at the Observatory. Rather than fight it, Scotty decided to leave. Henry then hired a part time machinist, Dick Hockley, who was my predecessor. His wife, Jean, was a secretary at the college and also was a friend of my wife, Joan.

When Howard Long started at Dickinson, the Department Chairmen were installed in a chairing ceremony. There was an actual chair and was usually named for the person or organization that provided an endowment to fund the position. The Chairperson expected to remain in the position until retirement. There was a great deal of prestige and power involved and it was considered an honor to be picked to serve. There was a fair amount of administrative work, so the chairman was relieved of some of the teaching load. Howard was very successful at obtaining grants from various sources and arranging to get free government surplus equipment. He also spent a lot of time and energy on plans to expand facilities for the Department. I accompanied him to various schools with new Physics buildings to take photos and talk with the professors to get ideas. We had also drawn up several scenarios for adding on to Tome building. There were supposed to be funds available but were diverted at the last minute by George Shuman, the college treasurer, for something he thought was more pressing. It goes without saying, we were very disappointed and upset after investing so much time and effort for naught. Howard was in for another disappointment. The administration at the college, for some mysterious reason, decided at some point to change the tradition of permanent chairmanship to a system of rotating the position among all the professors in each department. Each to serve for three years. The first year this was to take place, each department met to decide among themselves who was to serve the first term. The Department of Physics and Astronomy decided to offer the position to Neil Wolf who had been away from the department in Italy for a few years administering the Dickinson Year Abroad program there. As He was preparing to return to Carlisle for the next school term, he was contacted and he accepted. I remember that about a year later, I happened to be in his office about a personnel matter when he confided to me that the chairmanship was not so much about honor and prestige but about extra work and responsibility. He was happy to step down after his three years were up. I was also happy because he took his responsibilities as my boss too seriously. He was constantly wanting to tinker with what had been a smooth working priority system. In most cases it seemed to favor work that he wanted done for his Plasma lab projects. When plans for the new physics building were approved, Howard was finally recognized for his earlier planning efforts. He was chosen to break ground for the new Science building, which

would contain the Departments of Physics and Astronomy as well as the Math and computer science Departments.

Before coming to Dickinson, Ken Laws had been at Bryn Mawr in Philadelphia. While there he became engaged to Priscilla Watson whom he married after coming to Dickinson. They subsequently made a unique deal with the college. There was no opening for another full time professor in the Physics Department so they shared the equivalent of one professorship. As time went by, they both developed some lucrative research projects to work on when not teaching. Ken designed and had a solar house built in which was placed Henry's pigeon roosting boxes as a storage unit inside the foyer to be used as a place to park various items like car keys, gloves, caps, books, etc. As I mentioned earlier, he researched and wrote a book about the physics involved in ballet dancing.

When computers were just beginning to be used extensively, Priscilla worked on a project for using them in Physics labs for doing experiments. The easiest computer to use at the time was the Atari computer which had multiple ports which were designed for playing video games. Priscilla's young son, Kevin, and one of his friends, David Egolf, had been learning to write software programs so helped her get started. I built a number of interface boxes to connect to the computer and also some sensors designed to measure temperature, timing modules which were on-off switches utilizing light beams and photo cells, motion detectors and range finders. I also became an Atari repairman exclusively for the Physics Department. Early computers required a fair amount of maintenance. Eventually, Priscilla started up a company to have kits manufactured to sell to schools. The college treasurer was involved as the financial officer of the company which started with the name "Aardvark" at the suggestion of Priscilla's son, Kevin. A number of other people were hired at start up. Several computer programers were hired who were what most folks called "Nerds". They practically lived in Tome during the first summer and kept to themselves except when consulting with Priscilla. A man was hired to manage the company and was given a space in a college owned building which was a former shoe factory, now used for storage and

maintenance shops. An assistant for Priscilla was hired to help keep track of things. A part time industrial consultant came on board to contact manufacturers to make the parts needed for the various kits.

When the first modules were ready, a press release event was arranged for in New York City at the Time-Warner Building. There was to be a business arrangement with Atari to market the product. Unfortunately Atari was failing and so Aardvark eventually faded away.

Priscilla went to a workshop for physics teachers during which they were shown the value of having students handle apparatus to discover for themselves the principles of physics. Priscilla developed a basic physics course where there was less formal teaching and more emphasis on working in the lab. In essence, a self teaching course, guided by the teacher. I was called on to build some simple apparatus which was not available through the companies who sold scientific apparatus. As the idea developed , she involved the whole department so that it could be used as the alternative to the traditional lecture and separate lab course.It was eventually called “Workshop Physics”. She also collaborated with the folks who ran the workshop from which she got the idea. They held special summer sessions for Physics teachers to introduce the idea. A workbook was developed, written and published to be used in the course. I think that a Physics text was also used. The first years that it was used at Dickinson, I spent time in the lab with a video camera to record how well the students were doing during the workshop lab sessions. Priscilla had hired a number of people to help her with putting together the workbook. After each lab session she would write revisions and improvements. She also put together a talk for giving at seminars to introduce the Workshop method. She gave me a copy of the talk which she had notated with what type of video to show for each paragraph. I had labeled each video tape with the content so went through them and edited out the segments that worked with her comments. This was before software was available to do voiceover for a video presentation on a DVD. It was rather tedious to do but satisfying when the project was

finished. The seminars provided her with feedback which helped her with making improvements. As I remember it, she was still doing revisions when I retired in June 2000.

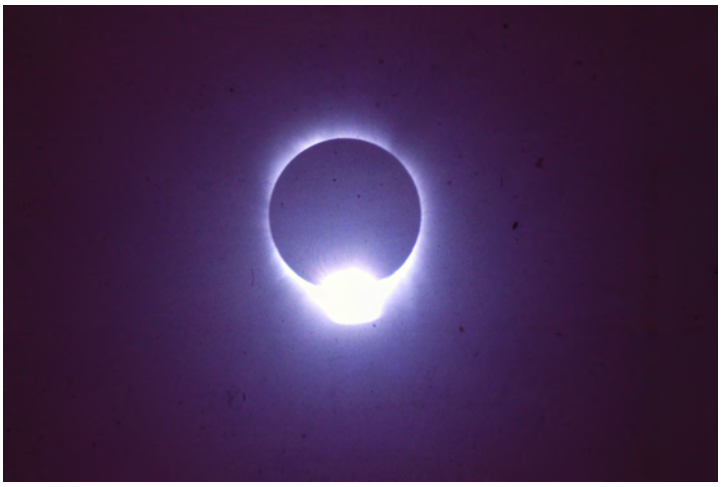
By this time Apple computers were being used for doing more sophisticated experiments than with the now defunct Atari computers. As she convinced more teachers to use Workshop Physics, a demand for the various sensors was created. A company called Vernier Software located in Portland,Oregon became associated with Priscilla and started to develop and sell the various sensors required, along with the software to do the experiments. They did the research and development work and arranged for the apparatus to be manufactured by outside contractors.

During development, there was an experiment designed to use a small Geiger Counter for nuclear physics experiments connected to a computer. The only thing available was a kit from a company called Heathkit .An electronics consultant who Priscilla worked with had devised a way to add a computer connector to it. She ordered 10 of them and arranged with me to assemble them for use in the Dickinson Physics lab. When she showed these to other teachers at the various seminars and meetings she attended, they asked where to buy the Geiger counters. Since Heathkit was the only source, they would have had to assemble and add the connector themselves. Most did not have the expertise for doing that so Priscilla asked me to build them for a nominal fee. I did quite a few until she decided that it was becoming too demanding of her time. She contacted Vernier Software who ordered some to work with and had their in house technicians put them together. When I did them, there were a number of problems with defective circuit boards which took a while to track down and correct. Vernier’s techs were having the same difficulties and not having much success. Vernier contacted me and asked if I would be willing to fix them. I agreed and sent them back the same day they arrived. Vernier then called me to see if I would be interested in assembling them. I spent the next 15 or so years building them as an independent contractor, along with the help of my daughter Lisa. She worked at home during the day. Of course this was on my own time. I still kept my job at the college and worked

evenings and weekends, averaging two hours each evening and 10 hours on weekends when we had kits to do. Heathkit went out of business at some point so Vernier started ordering the parts directly from the supplier to Heathkit , an interesting company called S.E.International. They originated when a group of folks who had formed a commune in Summertown, Tennesee. The called it “The Farm”. In order to survive, they decided to form a company to manufacture radiation monitors. One of the founders was a man named Daniel Sythe. He was the S in the companies name. I do not know who E was. I met Dan once when he visited Priscilla at Dickinson. He called me to inquire about Vernier when they were establishing an account to buy the Geiger counter parts. We became overwhelmed as Vernier’s sales of the units increased beyond our capacity to produce. It took us an average of two hours to assemble each unit which meant we could do about five a day. At the end, Vernier was selling more than 100 a month which was more than we could handle. The slack was taken up by other folks who worked for Vernier as independent contractors in Portland. We were at a disadvantage because of the shipping costs from here on the west coast. At the same time, the units that we worked on were becoming obsolete because the components were no longer available and had been replaced by something called surface mount technology. The equivalent unit was made to be assembled by machine. Therefore, we became obsolete. We tried to do other work for Vernier but discovered that we had aged to the point where our eyes weren’t seeing well enough and our fingers weren’t nimble enough to do the intricate work required, so we retired.

Going back a few years to 1973, Scott Smith, our Astronomer , came into my office one day and excitedly told me that he was slated to go on a trip to Africa to view a total eclipse of the sun and to take pictures. I jokingly asked if he would need any technical help. He pondered that for a few days and made arrangements through the Dean’s office to send me along too. We needed to be sure that it would not be construed to be a leisure trip, but would in fact be a contribution to the Astronomy program at Dickinson. Scott and I made plans for me to photograph the Eclipse and to chronicle the trip with a movie camera and still photos. I had a two inch refractor telescope that had been given to me by Harold Lott, the Biology technician who was

also a good friend. He got it at a yard sale and did not really have a use for it. I modified it to be used with a 35 mm camera that was loaned to me by Henry Yeagley. The camera was unusual in that it had a magazine that could hold 30 ft of 35mm film. It was also motor driven and could be used to expose film at the rate of 3 frames per second. I loaded it with the most sensitive color slide film available at the time. I also attached a solar filter to the front of the lens, which could be easily removed for photographing totality. The plan was to start taking pictures starting at first contact when the moon first moved onto the sun, then every few minutes during the partial phases of the eclipse and when it was within seconds of the total phase, to remove the filter and trigger the camera to take 3 frames each second. I was able to successfully catch the phases known as the diamond ring effect, and Baily's Beads just before and just after totality.



After much preparation and anticipation we left for New York harbor to board the SS Canberra with 1800 other folks on the way to a unique and rare adventure. The cruise was organized by Dr. Phil Sigler, an amateur Astronomer and teacher at New York University. The program was called "Voyages to Darkness" and ours was booked through African Eclipse Cruise. There was a second cruise called Caribbean Eclipse Cruise.

The eclipse was to be viewed on board the ship at sea off the coast of Senegal in Africa. There was a Meteorologist on board to guide the ship to a spot along the path of the eclipse which would be cloud free. There were weather satellites which he could connect with to view cloud conditions. The voyage took 16 days and spanned over 7,000 miles of the Atlantic Ocean. It was a bit disconcerting to observe on the first morning of the voyage, that we were absolutely alone in the vastness of the ocean. The only way to deal with the feeling was to keep busy with the activities on board the ship.

Some of the time was like most ocean voyages with plenty of leisure activities and entertainment available. We were given tours of the ships facilities which included a visit to the bridge. Someone asked the officer giving the tour about fuel consumption. He told us that they burned one gallon of oil per twenty feet of forward motion. He was also asked about how much time the captain was actually on the bridge and whether he had a regular schedule. The answer was “Madam, he is the captain, he can be here whenever he wishes and for as long as he wishes” There were also educational opportunities in that each day there were a series of appropriate lectures by experts in Astronomy, Photography, Meteorology, and history of the areas we were to visit on shore excursions. We were thrilled to listen to two of America’s Astronauts, Neil Armstrong and Scot Carpenter, talk about the space program and modern exploration. Isaac Asimov spoke about the history of Astronomy. Dr. J. Allen Hynek gave talks relative to the investigation of UFOs and stellar evolution. He had been the chief investigator of the U. S. Air Force “Project Blue Book”. I talked with him after one of his lectures for an hour about my involvement with investigating UFOs for NICAP. There were photography experts from Kodak lecturing about how best to record the solar eclipse on film. We were treated to having Miss Harriet Adams on board , who wrote the “Hardy Boys” series, the “Nancy Drew” series, Bobbsey Twins, Tom Swift Junior and

other books. I talked with her briefly at a reception in her honor. She was quite elderly and I remember that she took part in a party with the theme: the “Roaring Twenties”. She was dressed as a “Flapper” and participated in a dance contest. She overdid it and injured a leg muscle. We saw her every day in the dining room to which we were assigned. She usually came in surrounded by an admiring group of folks who seemed to have made it their mission to look after her. It was quite touching to see.

There was a one day stop over in the Canary Islands, which we found out was named not because of canaries but because of the wild dogs (Canines) which once lived there. When the Spanish discovered the Islands there were also humans living there who were tall with blonde hair and blue eyes and living a primitive life style. Some of the folks living there now have some of the same physical characteristics. Scott and I did not get to go but there was a tour of the volcano and the observatory built on top of it. We spent the day on a bus tour of Tennerife and did some shopping.

Then we steamed overnight to the chosen spot to view the eclipse. We rose the next morning and found a place on an upper deck where we set up our telescopes and cameras. Some folks had more elaborate equipment which took longer to set up so had claimed spots the day before and taped their tripods onto the deck. Some one near us who had arrived on deck just that morning laughed at the sight of all the tripods and dubbed the area “Tripod National Forest” The ship’s machinery had been shut down to minimize vibrations that may have interfered with the telescopes and cameras. A few generators were left on to power essential internal lighting, refrigeration, and the ship’s bridge instruments. There were announcements over the PA system as to the progress of the eclipse so that folks could anticipate when to take photos. Those of us who were recording the event on film had been advised to take time to just look and experience it without looking through the camera lens. I remember seeing the shadow coming toward us, then feeling a sudden drop in temperature as totality occurred. It was a strangely eerie experience even though we knew what to expect. This day was the reason that we went on the voyage and it was a total success. Now let me tell about the rest of the voyage.

The day after the eclipse we anchored off the coast of Dakar, Senegal. The ship could not be accommodated inside the harbor because every berth at dockside was taken by ships that contained relief supplies. There was a severe drought and only supply ships were allowed inside. We went ashore using our ship's life boats. We were given a box lunch to take along and stopped about noon at a tourist hotel where we were given bottled cold drinks. We sat at tables in an outside courtyard. Then went on a bus tour of Dakar and surrounding country side. This included stops at their parliament building, a Mosque, the president's residence which we only were allowed to look at from the road. The palace guards had been sitting under a tree when we arrived in our bus. They hurriedly rushed to their positions by the palace gate and stood at attention for pictures.They looked a bit out of place as they were dressed in uniforms that looked like the uniforms worn by the guards at Buckingham palace in England, complete with bearskin hats. At each stop, we were besieged by a cadre of young boys, selling trinkets and souvenirs. Necklaces made of native plant seeds seemed to be the main item. The more astute of our group did some fancy bargaining and were able to get four necklaces for a dollar. Some of the kids would hold a hand full of necklaces up to the bus window each time we stopped anywhere. After going back to the ship, I was sitting in a stall in the restroom when some joker dangled a handful of necklaces over the door and said "Necklaces mister? Two for a dollar!" After resting a bit, Scott and I went for dinner, then went back ashore to shop at dockside where a large number of folks were set up to sell handcrafted items. I stayed up all night on an upper deck with a group of folks who were looking at and identifying constellations that we could not see in our northern latitudes. I spent the wee hours just observing the shore and soaking up as much as I could of the essence of Africa, knowing that I would probably never go back. When we first went ashore and while mingling with the native people, I particularly remembered the feeling of being a minority and of being aware that these folks were different in subtle ways which defy exact description. My first impression was that Africa had a distinctly different smell and that the people looked and acted differently. It seemed strange that there were these black folks all speaking French. All in all it was an experience I will never forget. Our ship departed Africa about dawn the next day. Then it was off to bed until

midmorning when the room steward chased me out so he could clean and straighten up our stateroom.

On the subject of meals, we were assigned seats in the dining room for the first sitting of lunch and dinner. Since Scott and I were unattached on the trip, we were seated in a booth with two women who were traveling together unattached. One was a biologist and the other was an editor of a biology Journal. They lived in the Washington D.C. Area and traveled together each summer. They had done all the usual vacation trips and were delighted to be doing something unusual this summer. We could have breakfast anywhere and anytime we wished within the time frame allotted for breakfast. There were also an 11:00 AM and 3:00 PM tea times plus a Midnight Buffet. We could also be served a beverage of our choice and muffins, or toast in our stateroom before breakfast by our room steward. There was a door knob hanger with checkmark choices which you placed on the outside of the door before going to bed. The steward would bring your order at the requested time in the morning.

The ship's crew was structured along ethnic lines. The captain and officers were, of course, English, the engineers were Pakistani, the deck crew were from India, the dining room stewards were English and the waiters, cooks, and kitchen help were from Portuguese Goa, as were the room stewards. The Barmen were Irish. The entertainment staff and those who worked in the shops were for the most part, British.

We experienced a variety of weather conditions during the 16 day voyage, ranging from sailing through the tail end of a hurricane with rough seas, to moving through an absolutely glass smooth sea. During that period of calm, our ship was diverted to pick up an ill crew member of a freighter near our position. The Canberra had hospital facilities and a medical staff, who were able to care for him until we docked in New York a few days later. The transfer took place at night which some of us stayed up to watch.

It is worth mentioning that I spent most of my adult life with a sinus condition which caused frequent headaches. During the ocean voyage and shore excursions I never had a headache. The morning we arrived in New York harbor the sinuses started acting up and required medication to calm them down. I know now that it was and is our industrial life style polluting the very air that we breath. The voyage had been to parts of the planet with little or no sources of pollution. One disconcerting thing I saw was during an after dinner stroll on the promenade deck. I heard some noise coming from somewhere over the side and as I looked down over the rail, saw a door hanging open in the side of the ship. The kitchen crew was pitching garbage and trash right into the sea. I think that this sort of thing was common then but not at present.

Now for some final notes on the voyage; when I was preparing for the trip, I had heard stories from others that seasickness was common. I went to a druggist friend for advice and was given enough dramamine tablets to last the whole 16 days. I never took one! I developed my “sea legs” very quickly and when back on dry land again, had to get used to things not moving, particularly when in bed. I had difficulty sleeping the first night home. On the trip, the days were filled with interesting things to do. Life was relatively boring for a few weeks after returning home. I also had no idea how much that I missed home and family until the morning of arrival in New York. We were required to be interviewed by immigration officials and be issued passes to reenter the country. We showed our passports and other ID to prove we were citizens. The person I saw, said “Welcome Home, Mr Steigleman”. I nearly teared up and realized that I was glad to be back in familiar surroundings. For a period of time after returning home, I’m afraid I became a bit if a nuisance to everyone, constantly talking about the adventure of my life. Alex Cavalli, a Physics major and friend finally told me that I needed to cease and desist. Until then I had no idea how obnoxious I had become. Only your best friends can get away with that sort of thing.

Meanwhile, back to the college. I had determined that I would retire at age 62 and start drawing Social Security and my college retirement funds. The college had been a bit stingy with raises and I had determined that I would receive more money

retired than I was being paid by the college. Forty years at the same job was starting to wear on me mentally as well as physically. Most of the profs I worked with were retiring or about to retire and the new profs needed someone with a younger outlook.

As I mentioned before, after moving into the New Science Building, I spent my remaining time before retiring trying to finish a few projects related to organizing the demonstration store room and the shop storage area of metal, plastic and wood stock. I also put in a lot of time working on the Plasma Physics research equipment . When my time was nearly up, I spent time with my replacement, Rick Lindsay. The college would only let us overlap by two days so Rick came in the afternoons for a week after he got off work from his job. The professor who ran the Plasma Lab, Hans Pfister, was out of sorts that I hadn't finished the work in his lab. I told him that since that was out of my control, there wasn't much I could do, but that the new guy would now have some thing to work on, just as I did when I started 40 years before.

My department had a farewell dinner for me a few months before I retired. It coincided with an alumni function so a goodly number of alums came. Some of them got up to speak about their individual experiences while working with me on various projects and relating these to their present careers. One fellow had worked for NASA , helping to design the space suits that were eventually used on the moon landing project. He said that when he began, none of his colleagues had any idea about how things were built in a shop. He was able to advise them about how to design things that could be efficiently built with the machinery used in most machine shops. Up until that time I had no idea about the usefulness of the teaching that I did. Since I gave no exams or grades, I had no feedback to let me know how much the students were learning. Most of the physics profs and all of my fellow technicians were there. John Luetzelschwab was the department chairman so made all the preliminary remarks and introductions. John advised that I would have the last say after each person spoke. I expected that there might be some roasting since I was friends with everyone but was disappointed that no one did. One student, Joe Gaskin, who had spent one whole summer working with me in the shop told the assemblage that one thing he learned was to not answer the phone

for at least two rings. Everyone including me was aghast and didn't know whether to laugh or be embarrassed. I hurried to get up and explain. When I was hired, Henry Yeagley had to convince the college treasurer, George Shuman, that he really needed a full time technician. To avoid any possible problems, Henry instructed me to appear to be busy with something even when there was no real work underway. This included not answering the phone immediately even when sitting at my desk. The rest of the affair went off very pleasantly, reminiscing with everyone and receiving a few gifts. One notable gift was a cherry pie, brought by Vivian Garcia Arnold as she arrived in town just before the dinner. To this day I have no idea what she was thinking but as I was growing up, my mother would ask each of her children what they would like for their birthday dinner. My choice was meat pies and a cherry pie instead of a cake. Viv could not have known but gave me a more than appropriate gift.

Sometime during the last few months of work, I read the Dickinson employee hand book and discovered that the college would arrange and pay for a pre-retirement counseling session with a psychologist. When I called to make the appointment, the person who answered the phone had never heard of the arrangement or had ever made an appointment for anything like it before. I must have been the first to make the request. She put me on hold for a few minutes then connected me with whoever was in charge. A pleasant woman talked with me for a few minutes then made the appointment but was still unsure of the appropriate tone of the session. When I arrived, I met with the same person who then asked me about my hobbies, my personal life, activities, future plans and whether or not I would miss my job. She determined that I seemed prepared psychologically for retirement. Her only advice was to not hang around the house a lot , since my wife had been accustomed to me being away all day. It seems that too much togetherness was not a good thing. That was 20 years ago and things seemed to have worked out fairly well.

My last day, June 30, 2000 was exactly 40 years from my start date of July 1,1960. I was scheduled to go to the personnel office for an exit interview with the director, Robert Rasch. I arrived in mid afternoon and we talked about health insurance,

and other related subjects. He also asked if I had any thoughts about some ongoing problems the college had with how to treat the folks who were classified as technicians. There was one fellow who thought that he should have the same benefits as the office personnel, who only worked 35 hours a week and were on salary. We had been working as hourly employees and had the same benefits as the maintenance workers. This same fellow had talked with me and thought he was underpaid. My reply to him was to work a 40 hour week which would pay more. I relayed this to Mr Rasch and told him that I was leaving because of low pay. He was more or less powerless to do anything about raises but would relay the information to those who did. It is my understanding that my replacement, Rick Lindsay, after a few years did receive some decent pay commensurate with the job description.

After retiring from Dickinson, I worked for several more years working on the aforementioned electronic geiger counters for Vernier Software. I knew when I retired that I would have to pay for health insurance for my wife and I. The first year , I continued with the insurance that the college carried through a federally mandated health insurance program, called COBRA, but when the year was up, I had to find my own insurance until I qualified for Medicare. The money I made from Vernier Software helped to fund the extra expense until I was eligible for Medicare. We had been fortunate in the sense that we were financially comfortable and could afford to indulge a few whims. Unfortunately a combination of helping out some family members having financial difficulties and my coming down with a rare immune system disease called “Myasthenia Gravis” have interfered to a degree. Since my immune system has been medically suppressed to help deal with the Myasthenia Gravis, we will not be traveling or even attending events like concerts and etc. because of the chance of catching anything from others. We do however go out for an occasional restaurant meal. So far so good.

One more thing that’s worth mentioning is that I dream most nights that I am still working at Dickinson College in Old Tome Building, which seems to be in the process of being renovated while I am still working in the building. I am aware that I am in my last days of working but still have things to finish. I am usually with students, professors,

visitors and others who I can't quite identify and occasionally some I do know, but as in all dreams, there is only a vague notion of any point.

Someone had asked me what it was like to be retired. I replied that every day was like Saturday, except for Sunday. After having worked for all of my adult life, I was determined that I would not do anything that required a definite commitment of time. Some folks feel useless unless they are doing something every day. Not me! I thoroughly enjoy wasting time. I spent the first years of retirement working at my leisure, building radiation monitors for Vernier Software and providing work for my daughter Lisa. We both preferred to work later in the day rather than earlier, much to the consternation of my wife, who preferred getting things done and out of the way early. We also spent time helping our respective families with one thing and another as close families do. We are great believers in the saying " Charity begins at home."

To wrap up this essay, all of my work experiences seem to have been somehow planned and in some kind of logical order. Each job was preparation for the next, or so it seemed. By the time I started at the college, I had most of the basic skills and experience to easily go about performing the work. The folks I worked for and with were, for the most part, willing to let me exercise my creativity which made for a wholly satisfying environment. There were a few exceptions of course. Some folks gave me drawings and specific instructions which actually made my job easier. Everything balanced out in the end.

My time at Dickinson was a continuing learning experience. Starting with training birds using psychology , working with photographic film and making prints in a darkroom. Used various cameras in Physics experiments. Built electronic instruments from kits, and calibrated all kinds of electronic lab instruments. Installed an air quality monitoring system , performed regular calibration and maintained a log of the readouts. Installed a weather station including a wind speed and direction unit which I mounted on top of a 30 foot high tower on top of Tome Building . Installed a temperature recorder and a barometric pressure recorder with readouts located in a cabinet inside the front

hallway of Tome Building. Maintained a planetarium along with building special effects projectors. Maintained the driving system of a 32 foot long Foucault pendulum with a 400 pound ball. Early on, learned metal machining. Learned to use a video camera to record many hours of freshman students doing lab experiments in a new hands on method for learning Physics. Spent many hours editing and putting together a video for the professor to use in presentations of the method to other professors. Installed astronomy telescopes in a student observatory and kept them calibrated. Wrote technical instructions for building Physics experimental apparatus and learned to use a computer aided drawing program to make the illustrations . The last major task I completed before leaving was to install automated weather instruments on the roof of the new Physics and Astronomy building connected to a computer which recorded the readings. Also placed a number of antique physics apparatus in the display case in the hallway next to the shop-instrument lab.

I was never bored during my time at Dickinson but admit to being a bit intimidated by being surrounded by PHD professors. I often felt like I was faking my way through. The truth may be that I was constantly learning new things and new ways to accomplish my tasks. I was not aware that anyone disrespected me except for the occasional student who was not aware that I was more than a machinist until they needed my help with designing a project for their senior year. Quite a few came to see me after graduating, expressing their thanks for teaching them the practical side of Physics.

I was also privileged to be in a position to meet a few famous folks during my time at Dickinson. The first was Dave Garroway, who was an early television personality. He hosted one of the first TV network morning talk shows. He was also an amateur astronomer who observed variable stars. It was arranged with Dr, Yeagley for him to use our observatory while in our area to gave a talk. I was given the task of admitting and assisting him as Henry Yeagley, for some reason I can’t remember, couldn’t be there. I spent an informative evening chatting with him as he did his observing.

Dr. Carl Sagan came to the college to give a lecture and to receive an honorary degree. I spent an evening at a reception given by the my department and was disappointed to observe that he was a bit pompous and not the down to earth person he was portrayed to be on the TV series “Cosmos” , which he hosted. He also originated the SETI group which searches for extra terrestrial Intelligence along with similar endeavors.

Isaac Asimov, a prolific author of over 500 books, on the other hand was the opposite. I met him on the eclipse cruise and chatted briefly with him after a lecture he gave. I found out later that when he traveled, he took along two IBM Selectric typewriters so that if one malfunctioned, he had a backup. It was purported that he set himself a goal of writing a minimum amount of pages per day and that he never had to rewrite or correct mistakes. All the editing was done in his head before it went on the paper. He was one of the first Science Fiction writers and edited and wrote stories for a monthly magazine. I have his autograph.

Most notable was the chance to see and shake hands with Astronauts, Neil Armstrong and Scott Carpenter, I spent 16 days on a ship with them to observe a solar eclipse which I described earlier. Armstrong was a bit shy and retiring while Carpenter was outgoing and very sociable, He seemed to spend a lot of time chatting with the female entertainers on the cruise. I also have their autographs.

I spent a very pleasant hour chatting with Dr. J. Allen Hynek, an Astrophysicist , who was in charge of the the US Air Force “Project Bluebook” which investigated UFOs. I had been an unofficial member of a group called NICAP which investigated sightings of unidentified flying objects. He was a plain spoken person who listened intently about my experiences with the group. He also appeared briefly in the movie “Close Encounters of the Third Kind”.

There seems to have been a strange juxtaposition of the number “2” connecting my working life. To wit; starting work at age 12, beginning work at the college at age 22, retiring at age 62 in the year 2000 and I am writing this at age 82 in the year 2020. One can only guess at the significance of the next number 2 !

I cannot close without mentioning that when I started my adventures at Dickinson, I was surprised that several retired professors came to me at various times to visit and to offer advice. A Dr. Ralph Schector, was an amateur photographer who had a darkroom in a closet under the stairs in the college Gym. He advised me about developing film and making prints, which came in handy throughout my career. He lived two doors from our apartment house and I was pleasantly surprised one summer day to hear violin music coming through the open window in front of Ralph’s house. He, his wife, daughter and son formed a string quartet and played regularly, but only at home. I can’t speak for the other neighbors but my wife and I regularly opened our front window to listen and enjoy. I sometimes would sit on the front stoop of our apartment house, to hear better,

Dr. Milton Eddy, who had an office in the basement of a men’s Dorm, invited me to visit his office just to chat. He was an early investigator of forensic science. He had also traveled some and had an interesting collection of artifacts scattered about his office. He had many interesting stories to relate about them. Knowing that I was newly married, he gave me a ginseng root to nibble on occasionally, which was supposed to make one more viral. I did , but was not aware of any effect.

Dr. Gleim was a retired Chemistry Prof who I met when attending a pistol match at the Carlisle Gun Club before I was married. He was an avid pistol shooter, and also a fisherman who loved talking with me about fishing when we had chance meetings on campus.

Dr. Jack Benson, a Chemistry Professor, and a friend, had at some point in his career, came down with some kind of metal poisoning. He went every summer and on

his sabbatical year off, to spend time in a hot climate to sweat out the metal. He claimed that the treatment was known from ancient times when the Romans sent miners to North Africa to keep them healthy.

The first class of his Chemistry course always included a demonstration of the Gas laws having to do with pressure, volume and temperature. The demo consisted of discharging a CO2 extinguisher out over the class so that they would feel the cold air as the gas was released. He did this on the first day after he had returned from a year off on sabbatical leave. The extinguisher was always kept under the lecture desk in case of a fire in the lecture hall. It just so happened that the fire codes had changed that year so that CO2 was replaced by a dry chemical extinguisher. Jack had no way of knowing, so sprayed the class with white powder. The room cleared out in a very short time. I don't remember whether there were any health consequences, but Jack never lived that episode down.

The foregoing were examples of folks who, when you met them, knew from their demeanor and their clothing, that they were Professors. They seemed for the most part, to be not the least pretentious. As the years went by, the professors who came later, seemed to be somehow less professorial. The phrase " a Gentleman and a scholar " come to mind, to describe the older generation of Professors.

I would be remiss if I didn't acknowledge the many extra benefits that I received at Dickinson. I came down with a serious ailment that required extended hospital time as well as a long recuperation. I received full pay for three months and would have received half pay for three months but managed to work half time and so received full pay. The college hired a part time machinist to work as a temporary until I could go back full time. If I had needed to do the same thing after a year, the same benefit would have kicked in. I also was eligible, because of years of service , for four weeks of vacation a year and something like 12 holidays. I don't think any of this would have happened had I worked any where else.

Somehow, for some reason, I was asked to serve on an employee's committee called " Committee on the status of women at Dickinson College" We met once a week and to this day am still mystified as to the purpose and exact function of the committee. It was educational for me personally in that I learned a lot about women's attitudes, perceptions, sensitivities, and nature concerning their status in the workplace and life in general.

I also need to acknowledge my gratitude to Henry Yeagley for hiring me, for his patience and encouragement when I was learning the job and his friendship while he was still at Dickinson. He had moved back to Penn State when he and Blanche needed to be looked after. Both were well up into their Nineties at the time. When Henry passed away there was a memorial service held at Dickinson. I had occasion to talk with his son and told him that I liked Henry as a friend but not when he was my boss. He smiled and told me he wasn't surprised. Henry made it a point to visit me in my shop the day before he left, to say goodby. It was, to say the least, quite emotional for both of us.

So ends the saga of my time at Dickinson College, an educational exercise that continues even today and into the future.