

# My Life at Purdue

William R. Fuller

Selected chapters from my Autobiography

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## MS to Ph.D. via NOPI

September, 1949 – August, 1957

As I mentioned earlier, I received an offer of an assistantship from Ralph Hull, Head of the Purdue Mathematics Department in March, 1949. I came to Purdue University as a Teaching Assistant (TA) in Mathematics in September, 1949. Such people were normally hired to teach half-time. At that time this meant eight classroom hours per week plus preparation, grading papers, office hours, etc. I had some GI Bill eligibility remaining, so I was able to reduce my load to only one five hour course.

TAs usually taught Algebra, Trigonometry or Analytic Geometry. After getting a Masters degree TAs could teach Calculus. In those early days, I mainly taught Algebra.

The Purdue Mathematics Department had several specialized algebra courses. One was for “Home Ec” students. Typically, these classes were composed of only females. Except that the subject tended to be low level: conversion of units of measurement, etc., it wasn’t a bad class to teach. Mathematics for Agricultural students involved stuff about mixing concrete, number of board-feet in a log and the volume of hay stacks.

Through the Purdue housing office, we secured an apartment at FPHA 213-3. The rent was \$40 per month plus an additional \$8.50 for utilities. A space heater was furnished. The FPHA housing consisted of one story, tar-paper covered buildings which had been Army barracks somewhere.



*Typical FPHA unit* in a three apartment unit. This was nice in at least two ways. It had end windows for more light and air and it only received the noise from one adjacent apartment. The walls were rather thin, so this location was a real advantage. The windows fit poorly. When it rained it was necessary to place rolled up towels on the sills to prevent water from streaming into the rooms. The only heat was the gas space heater in the living room. All these units were about 24 inches above the ground, mounted on concrete blocks. So they were a lot like Ravenswood, but without floods. There was a “crawl space” under the building. The wind whipped through this and frequently blew out the flame in the heater. When

this happened at night, it got pretty cold in the apartment. Except for cross ventilation there was no relief from the heat in the summer. While life in these apartments was a lot like living at 1608 Haynes Avenue in Ravenswood, we did have indoor plumbing!

There were five such areas comprising perhaps 1000 apartments. FPHA 213 was for families who had two or more children. We, therefore, occupied a two bedroom apartment. There was large play space about fifty feet wide between buildings which was nice for kids. There was little traffic except for residents. No telephone service was available to individual apartments. There was one phone, placed high on a pole (so kids couldn’t get to it) between apartments that could be used for emergency outgoing calls. Notice of incoming calls was brought by the police as in the case of Aunt Josephine’s death (see below).

Lou, Dick, Ted and I shared our building with Don and Virginia Burroughs and their children Donald Lee, Virginia and John, and with Garnet and Carolyn Welch and their two children.

One of the things that made FPHA 213 memorable was both Dick and Ted contracting Chicken Pox. Not a terribly dangerous disease, it nonetheless causes a great deal of discomfort. Both kids required a lot of bathing with Calomine Lotion to allay the itching.

The money from the GI Bill and the assistantship let us live, but without many luxuries. Occasionally we would get “Spud Nuts,” doughnuts made with potato flour, from a little diner at the corner of Third and University Streets. This building was razed for a parking lot in 1999. In 2006 the new Computer Sciences building opened on that corner.

Typical entertainment for Dick and Ted included driving down the stadium “roller coaster,” a hill along west side the Purdue stadium that descended sharply, leveled off, descended again, etc. This road was eliminated in a stadium remodeling in 2002. Another diversion was parking on a Lafayette street to watch the trains go through downtown on Fifth Street. These trains were eliminated in about 2000. Sometimes there was some activity to be seen at the Purdue airport.

Dick was five years old when we first came to Purdue. He attended a cooperative Kindergarten on the Purdue campus. The site is now marked by the University water tank. Cooperative meant we all paid a bit toward the teacher’s salary, contributed juice and cookies and helped with instruction. It was the non-student adult, usually

the mother, who handled these chores. The second year Dick went to Klondike school. "Purdue kids" were not exactly welcomed with open arms because they lived in non-taxed homes.

In the summer of 1950 Aunt Josephine died in Chicago. I don't think I had seen her since that day in 1941 when she brought me the watch. I don't know why she lived in Chicago or what she did for sure. It is thought that she was a secretary. The Indiana State Police brought word of her death. They had been contacted by the Illinois police who got our name from a letter Lou had written to her. Apparently that was the only clue they found in her apartment. I had to take a day off from study and teaching to go to Chicago. None of us knew anything of her affairs. I met a lawyer who agreed to have her remains cremated and sent to me in exchange for signing whatever she had over to him. We had no resources to do anything else. It was one of the most stressful days of my life. I've been a little resentful that she kept herself so completely aloof from us. The lawyer kept his word. Her ashes did arrive and were interred in Crown Hill Cemetery in Indianapolis. Later a few pictures from her apartment arrived.

Because we were so busy with studies, there wasn't much social life. We occasionally got together late at night with Don and Virginia Burroughs. That's when the Spud Nuts came in. Occasionally fellow students Nick Vaughn or Walt Wood came to study and socialize.

Our church at that time was called the University Baptist Church. This church was really a mission to Purdue students. I think it was originally supported by an off-campus group as a mission activity. Reverend Stacy F. Shaw was the minister and put a great deal of himself and his business into keeping it going. Since I was mainly a student, I didn't take an active part in this church although we were faithful in attendance.

I shared an office with five other people in an old creaky building called Stanley Coulter Annex. Three of them were graduate students like me and two were non-student Instructors. Other graduate students were next to us with only a seven foot wall separating us. Generally, it was quiet, but on Friday, when the *Nation* weekly came things livened up a bit. This was not so much for the erudite articles in that intellectual paper, but because of the Crossword Puzzle. Many of the clues turned on puns: Nationality of Passengers on a bus at a stop perhaps? Lapplanders. Why did the brothers call their cattle ranch "Focus?" (Because that's where the sons (sun's) raise (rays) meet.)

Studying and teaching took up most of my time. Occasionally, a fellow student would have a party. "Charades" was a popular way to spend time at these parties. There was not much, if any, alcohol at these parties.

Because of a reduced teaching load (G.I. Bill help), I could enroll in more courses. As a result I completed the work for the Master's degree by January, 1951. (See Page 251) My examining committee was composed of Professors Howard K. Hughes, E. A. Trabant, Vivian A Johnson, Physics (I had a minor in Physics); and Ralph Hull, the Head of the Department.

I suppose Hull was a good mathematician; I didn't have a way to judge that. As a teacher, he left something to be desired. I had several good teachers; the best was Professor Michael Golomb, but that probably belongs in a later Chapter.

Along the way, I completed the requirement in reading in German (July 14, 1950) and French (August 18, 1950) which were required for my subsequent Ph.D. studies. Although I had come home from Europe with a fairly good, street level, speaking knowledge of German, I knew nothing of grammar. My teacher, and later colleague, Merrill Shanks, and I often joked about translating the opening phrase of Landau's *Grundlagen der Analysis* and having a word, "an," left over.

The next major event that influenced my life was the Korean War or Police Action, as it was euphemistically called. Korea had been divided into North and South Korea after W.W.II, the North being communistic and adhering to China. On June 25, 1950, the North invaded the South to force re-unification. The United Nations organized a police force to resist. The U.S. was a major player in this conflict. Men were being conscripted to fight there and reservists were being called back to service. I was still a Reserve First Lieutenant of Artillery. Having already enjoyed travel to one foreign country, I decided that I did not want another such tour. I looked for some way to ensure that I would not be called up.

While at Butler, I had interviewed the U.S. Naval Ordnance Plant, Indianapolis (NOPI) about a job. They wanted me, but I decided to go to graduate school. Now at the completion of my Master's degree, I contacted Kaj Nielsen of the Mathematics Division on January 11, 1951. Kaj responded in letters dated January 16 and 17 that pending completion of paper work necessary to qualify for a Civil Service appointment, he would be able to offer me a position as GS-9 with a starting salary of \$4,600 per year. I accepted

this position and started work as Mathematician in February of 1951. I was never called by the Army, but NOPI was a good experience.

I felt that I had taken a wise step since, under date of 1 December, 1950, I was appointed as a 1st Lieutenant in the Artillery. I had thought all along that I already had this by virtue of what I had been told at Separation in November, 1945. The on the 31st of that month, I was offered the opportunity to decline an appointment as a Reserve commissioned officer. I received an Honorable Discharge dated 1 April, 1953.

While I started work a NOPI, Lou and the boys stayed at Purdue during the Spring semester of 1951 so that Dick could complete the year at Klondike School. It was a tough winter. On one occasion the pipes in the apartment froze due to the space heater going off. Lou had to deal with that on her own. I came up to Lafayette each weekend.

I took a room near the plant, but I didn't like that kind of living. Bob and Rhoda were kind enough to offer me to live with them and share a room with my nephew, Robert John, Jr. When the school year ended, Lou and the boys moved to Indianapolis and we rented a house, which we ultimately bought, at 1536 East 73rd Street.

So, again, we were back in Ravenswood. This house was also in the flood plain of White River, but was elevated a full room level above the ground. There was a basement and garage under the house. It was like any small house one might find except for the elevation of the living quarters. We rented the house from Rosemary Delatore whose father, Frank Delatore, an Indianapolis policeman, had built it for her. When she wanted to sell it, we decided to buy it as we thought we were in Indianapolis to stay. We were able to borrow the money from a good friend Herbert Reeder (Herb) Bailey, whom I had met at NOPI. At this time Herb was a graduate student at Purdue and a student of a man I was to meet later, Lamberto Cesari. Without lawyers and by a simple hand-written note we completed the deal. The whole thing was handled very informally. Every time we made a payment, I calculated the interest due, added it to the principal and subtracted the amount of the payment.



1536 East 73rd Street  
The Picket fence was  
added later.

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July 24, 1952

*I promise to pay the sum of \$6000.00 plus interest at 5.5% per annum to Herbert R. Bailey. The above amount due by July 24, 1967. Amount subject to reduction by monthly payments.*

We made payments regularly until I returned to Purdue to complete my Ph.D. degree.

We put the house up for rent, as we fully intended to return there after the degree was completed. The renters often defaulted and when they did, Herb got no check. He never questioned what was going on. Mrs. Gambill, Bob Gambill's mother, sold the house for us when we decide to stay at Purdue, and we paid Herb off in full in 1964.

Herb later confided in me that his mother thought he was crazy to make such an unsecured loan. However, this gave us a start on equity development which stood us in good stead later on. Herb got a little higher rate of return on his money and we paid less than we would have paid to a bank. This act of friendship has always been warmly remembered!



Herb in 1952

While living at 1536 73rd Street, Lou had the misfortune to miscarry what would have been our third son.

Also while at 1536 East 73rd Street, Bob and I, along with Dad, spent a lot of evenings putting a solid foundation under 1608 Haynes. We mixed our own concrete for the footings and laid three courses of concrete blocks on these. In the process, we leveled the floors. This was good and bad as it developed that the floors had never been level. After this job we had to patch some corners where the wall board had come apart as part of the levelling process.

While living at 1536 E. 73rd Street I won a Sealy mattress from a radio show. A radio station called early one Sunday to see if someone would be home to take their call. They didn't want to waste time calling a number which wouldn't be answered. I assured them I would be home. However, we didn't have a radio! I borrowed one from Mom for the afternoon and listened carefully to a 15 minute detective drama. I decided that what they asked would have to do with numbers. I wrote down every number that occurred. The question was: "What were the odds on race horse?" I knew, and won the mattress.

When we came to 1536, the lot on which it

was built was a forest. The sun never shone on the house. It was still a forest after we had 11 trees cut down, but at least we could dry out somewhat due to increased sunlight. The cut trees provided a stack of firewood of fireplace length which was about four feet high and fifty feet long. The house had a nice fireplace and we used this wood in it to warm the house on chili days.

Different from Haynes Avenue, this house on 73rd Street had indoor plumbing. However, there were no sewers in Ravenswood. We had our own septic tank which drained into a “finger system” of clay pipes to diffuse the water into the subsurface gravel layer. One of our early jobs was to have repairs and extensions made to this system.

Another nice feature of 1536 E. 73rd Street was that Bob and Rhoda lived in Ravenswood also. That gave our sons, especially Dick who was older, a chance to get to know his first cousins, Robert John Fuller, Jr., and Deborah Sue Fuller.

I carpooled to work at NOPI with several others in the area. My memory problems showed up even in those days when I drove on a day when I also took the car to a repair shop. I forgot that I had passengers to take home. We were all stranded for a while. This car was a Maroon 1949 Hudson. It was a pretty car and had good riding qualities, but a long drive shaft with two universal joints was prone to failure. When we tired of the repair bills, we bought a Blue 1952 Chevrolet with an automatic transmission. Once Lou drove this kind of car, nothing else would do.

My immediate boss at NOPI was Kaj Neilsen, a good applied mathematician and avid Bridge player. He gave me one simple sounding assignment when I reported for work there. Kaj handed me a book entitled *The Mathematical Theory of Toss Bombing*. His words were: “Go away and become an expert on this.” Almost every thing I did at NOPI flowed from that assignment. By the way, “toss-bombing” is an approach to bomb delivery where the aircraft comes toward the target at a low altitude, pulls up into a climb, releases its bomb, rolls over and flies away in the opposite direction. An effective approach if the pilot wants to be out of the impact zone as rapidly as possible.

My principal work was monitoring and analyzing the efforts of several Navy of Bureau of Ordnance contractors. This work took me to various sites in and around New York City including Pleasantville and Syossett, Long Island. One Bureau of Ordnance contractor was located on *Skunks Misery Road*. It was always work; I never allowed extra time for seeing much of the city.

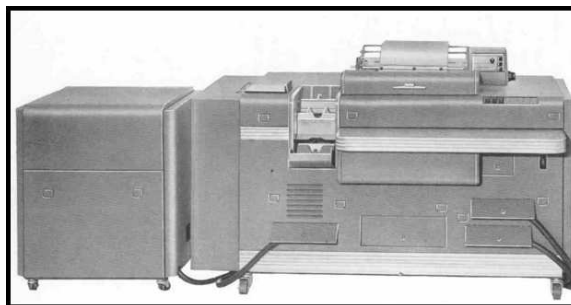
I also made a few trips to the Naval Ordnance Test Station (NOTS) at Inyokern, California on the edge of Death valley. This was where some of the ordnance was actually tested. They had an interesting view about humans and “black boxes,” as computers were called. “Humans are not as efficient as black boxes for certain specific operations, however, they are more easily maintained and may be produced by relatively unskilled labor.”

The flight from Burbank to NOTS was by a DC-3 commuter. Completing his work as ticket agent, the attendant became the luggage handler. Then he appeared on the plane as cabin attendant. No he didn’t fly the plane.

Most of the work I did at NOPI/NAFI was classified: CONFIDENTIAL, SECRET, etc., so I couldn’t take away copies of my papers when I left. My work required that I apply for “Q” clearance which was the level required whenever discussion of “special weapons” came up. This was a Civil Service job and I believe my rating was GS-12 at a salary of about \$7,000 per year when I left NOPI.

At NOPI I applied some of the mathematics I had learned. This included infinite series to approximate functions, differentials to estimate errors and sensitivity in mechanization of functions, and matrix theory. The elementary theory of motion from physics was also involved.

In 1951, calculations were done using electro-mechanical calculating machines. (Frieden and Marchant were manufacturers.) Around 1952 machines like this which could extract square roots became available. This was a major advance. Before they became available, we used Newton’s Method or subtraction of odd integers to find these roots. These calculators were desk top units which displayed the results of computation in a dial. Although these had to be copied down manually, they were a big step up from the slide rule.



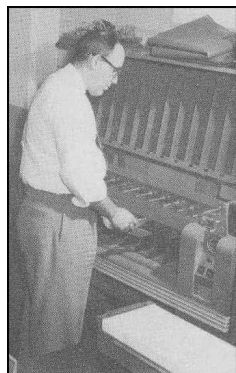
Then came the Card Programmed Calculator. (above)

The CPC was basically a printing device know as a tabulator. Electrically attached to it were one or more storage devices (ours at

NOPI had two). These devices were also electro-mechanical.

Each device held, as I recall, eight banks of ten wheels on axles. The numbers in decimal notation were printed on the perimeters so one could read directly what was stored there. A control panel, wired by the computer programmers of those days, directed the flow of impulses and provided computation of functions such as the trigonometric functions and logarithms. We, the users, wrote our instructions on the famous "IBM Cards." One operation between two numbers was allowed per card. These numbers could be punched on the card directly or the punch could call for a number in storage.

The "program" delivered to the machine operator was a collection of cards appropriately punched with numbers and/or sources. Instructions to the operator were like: "Run the deck with the pink stripe until the number output is less than (some specified value)." This was an early form of what became FORTRAN's LOGICAL IF. "Run the blue deck 51 times" pre-shadowed the "DO." and so forth. These cards, with one operation connecting two numbers, ran through the machine at the



*Sorting cards  
for the CPC*

rate of 150 cards per minute if there were no jams. Very primitive, but in 1952 and 1953 this was as much of an advance as if we had been transported aboard the Starship Enterprise!

The first electronic computer came to NOPI about the time I returned to Purdue to work on my Ph.D. On this new computer, which I hadn't used, the program on cards was read into the computer which then performed the computations without supervision. This was known as a Stored Program Calculator. Both of these terminologies have vanished from the computing vocabulary.

All of this was before the development of transistors and the miniaturization which they have made possible.

During the Spring Semester of 1954, I taught a course at night for Butler. The course was Algebra for Business and I was paid \$500 for teaching it.

In March of that year a friend, Bob Gambill, whom I had met while studying at Butler wrote to express his interest coming to work at NOPI. He did so and worked there several years. Our paths

continued to cross as Bob came back to Purdue several years later as I will relate in another Chapter.

Also during the late Spring of 1954, I went on a trip for NOPI to visit the Navy Bureau of Ordnance in Washington, DC, and to visit some researchers at the University of Virginia at Charlottesville, Virginia, on NOPI business. This was Cherry Blossom time in Washington, so we decided to make a family trip of it, combining business with vacation time. The blossoms were a little past their prime, but still quite lovely.

Enroute to Washington, we experienced a bit of history by stopping briefly at the Gettysburg Memorial.

In Washington, we camped in a camp ground on an island in the Potomac River. This was a very crowded site. We had two tents; one for Lou and me and one for Dick and Ted. We just had room for our tents and no more. We couldn't tell if the kids arguing were ours or some in another tent. This did give us a chance to see some of DC. We went to the Smithsonian, Lincoln Memorial and the Capitol Building among the sights of Washington.

Leaving Washington, we drove down the Skyline Drive to Charlottesville. While I visited the university, Lou and the boys toured Montecello, Thomas Jefferson's home. I didn't get to see that until a much later trip. Of course, this was the days before the Interstate Highway System had been built. Therefore, coming back to Indianapolis was an arduous trip with many miles of narrow roads through the mountains.

Toward the end of my tour at NOPI (which may have become NAFL, Naval Avionics Facility, Indianapolis, by that time) in the Summer of 1954, I was working on analyzing the motion of a gyroscope for controlling the direction of an aircraft firing machine guns toward a moving target. With use of rotation matrices to represent the gimballing system of the instrument I was able to explain anomalies in the motion which the physicists had observed. For this simple work I received the Navy Meritorious Civilian Service Award. The award was dated December 6, 1955 and was signed by R. F. Scott, Capt. USN. (See Pages 255, 256)

My path recrossed with Roger Scott when he completed the RASTP (see next *Professional Life Starts*) and became a Science Counselor and Instructor in the Department of Mathematics and Statistics at Purdue.

During this period I received a bonus from the State of Indiana for my WWII service. (See Pages

197, 198) Records indicate that the amount was \$453.34. The length of service on which this was based does not exactly agree with my count, but I don't remember contesting their figure. Some of that money went for a new nylon dress for Lou. Having been used for parachutes during the war, nylon had not been available for clothing for several years. Nylon provided one of the first "wrinkle free" fabrics for clothing.



Lou in her nylon dress with Dick, Ted and me.

A truce agreement in the Korean War was signed and fighting stopped in July, 1953. I suppose the troops were not sent home immediately, because of the fragile nature of the peace. But by 1954 they were coming home in large numbers. Again this produced a flood of veterans returning to college campuses. The assistant department head at Purdue, Dr. Harold S.F. Jonah, remembered me as a good teacher and cooperative person who had wanted to pursue the Ph.D. He contacted me to see if I wanted to come back to Purdue as an Instructor (the lowest faculty rank.).

My reserve commission had also expired (See Pages 199, 200), so I could resume my graduate studies without concern for being called to active duty.

After a lot of soul searching Lou and I decided that returning to Purdue was the right thing to do.

The decision to return to Purdue having been made, I sought the support of Kaj Nielsen, and was granted a one year leave of absence from NAFI. I did not expect to return after one year, expecting extensions of my leave, but did expect to return eventually. I did work at NAFI during the summers of 1955 and 1956.

I accepted the offer from Ralph Hull on June 3, 1954 and returned to Purdue that Fall.

This meant that we had to find a renter for our house at 1536 E. 73rd Street and find hous-

ing in West Lafayette. It also meant leaving a church that had been important to us for the previous three years. That was the Victory Missionary Baptist Church in Indianapolis. We attended this church during our stay in Indianapolis from 1951 to 1954. We were very active in this church and I taught the adult men's bible class on Sunday morning during part of that time.

The mid 1950s was an era of extreme paranoia with regard to Communism and the Soviet Union. Senator Joseph McCarthy of Wisconsin chaired some investigative committees of which the House Committee on Un-American Activities was the best known. History books will have a lot to say about that organization, so I'll omit further discussion. But the atmosphere created was one in which Loyalty Oaths were required of all sorts of people. Before returning to Purdue, I had to complete President's Office Form 15 as were all "professors, instructors, and teachers in colleges and universities in the State of Indiana supported in whole or in part by public funds . ." We had to sign, in the presence of a Notary Public, an oath which read:

*I solemnly swear (or affirm) that I will support the Constitution of the United States of America, the Constitution of the State of Indiana, and the laws of the United States and the State of Indiana, and will, by precept and example, promote respect for the flag and the institutions of the United States and the state of Indiana, reverence for law and order and undivided allegiance to the government of the United States of America."*

This oath taking caused me no problem at all, but some objected to it on several grounds. One colleague wrote that he was not sure he could think of "examples" and if he were able to, how could he compel others to listen to them. While my own memory is not clear on this, the local newspaper reported that he was fired for not signing.

In 1954, as in 1948, housing was in short supply. I applied to housing director, Irving Wilson, to live in the FPHA area again. He responded that nothing was available at that time, but would "keep my request on file." When I checked later, they could not find my application. Finally, it turned up in a "completed" file. I asked why it had not been kept in a more active status. The answer was: "I guess we thought our letter settled the matter." A glimpse of the administrative mind.

We found housing in West Lafayette at 120 Sylvia Street. This was a double, converted into four apartments. We had one of the first floor units. The landlord, Francis Cobb also worked in the Chemistry Department. He was a decent landlord. One entered the apartment through our bedroom (which served as my study area as well); this was followed by the living room and, finally, side by side, a bedroom for Dick and Ted and the kitchen/dining room.

Dick had had a most unfortunate year at John Strange School on the near north side of Indianapolis. This was the same school my brothers and I had attended in the 1930s. Dick's fourth grade teacher led them to participate in a sort of rhythm band based of clapping wooden blocks. This activity was such an obsession with the teacher that the kids progressed only a few months in academic subjects. Since



*The Family in 1954*

we were now moving to a new city, we thought it would be a good time for Dick to repeat the fourth grade. The West Lafayette school officials agreed and that was what happened. The schools in West Lafayette were more academically oriented, so he would had a difficult time with the inadequate preparation he had been given.

Ted also started Kindergarten at this time. Both boys attended Morton Elementary School.

My salary as an Instructor in 1954 was \$4000 for the academic year. It wasn't much and the GI Bill benefits were exhausted. Lou was always a good cook and manager, but I remember eating a lot of tuna during that period. Lou prepared it as creamed tuna, served on toast; as a noodle casserole; a rice casserole and as tuna salad.

At 120 Sylvia we learned about Ted's ability to read into something only what it actually said. One evening, while Dick and Ted were in their room studying, we heard a loud argument. Dick finally came out and expressed dismay over Ted's inability to determine how many right angles there were in rectangle and in a square. I asked to see the text. There I found a figure consisting of a vertical segment and at right angles to it a horizontal segment of twice the length of the vertical one. Beneath this figure were the words "Right

Angle." I asked Dick if Ted had claimed there was one right angle in the rectangle and none in the square. Dick said; "Yes, but how did you know that?" I pointed out on the basis of the definition Ted was absolutely correct. The engineer, which Dick became, instinctively knew that translations and rotations didn't change the "right angle" but, logically, he had no basis for that. Ted's instinct was the more logical if not the more useful.

At another time Lou and I both contracted a very debilitating case of influenza. A neighbor and fellow graduate student, Alfred Schmidt, helped us by bringing prepared meals. Al was also a student of Lamberto Cesari.

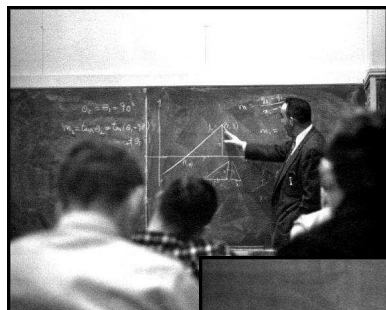
There may have been as many as a dozen new Instructors at Purdue that Fall. I was the only non-Ph.D. in the group. I don't remember many who were in the group except for long time colleague Christoph J. Nuegebauer. Bob Baer and Nick Kazarinoff were two more. Instructor was the normal starting rank at that time. The Faculty Handbook stated something like: "The rank of Associate professor is the terminal rank for most members of the faculty."

Professor Hull met with us before classes began to emphasize the importance of good teaching. He explained that he or other senior faculty members would visit our classrooms in order to be able to make helpful suggestions. He related 12 points upon which the "senior observer" would be rating us. I have forgotten most of them. Three were: Is the Instructor wearing a neck tie? Does the Instructor have the students working at the chalkboard? Does the Instructor appear to be on the student's side in the struggle against the difficult material? I always thought the last one was worth while. I didn't think much of wearing a tie as a criterion for judging a teacher, but I always wore one! As for having students work on the chalkboard: that was already a practice I had started during my year of teaching at Butler. I'm not sure how effective it is, but it does give the students a moment to move around; sitting for an hour can be very tiresome.

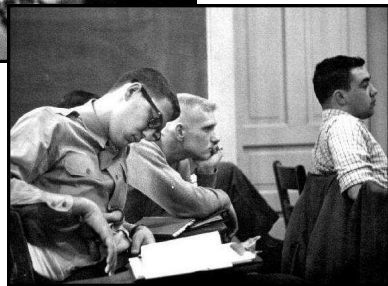
A few days later, Professor Hull climbed to the fourth floor of Purdue Hall to visit my classroom. As soon as I saw him, I sent all my students to the chalkboard. Finally, out of boredom I suppose, he went to the board to work with some of the students. Later I asked him how he liked my class? He said that he had not expected to find anything wrong in my class. I then remarked that I had been embarrassed by an approach that some of the students had been following to one of the



problems. Professor Hull said: “Oh, that’s the way I was showing them to do the problem.”



Cause



Effect

*Fourth Floor Purdue Hall - 1954*

The University administration in 1954 considered the Mathematics Department to be a service department. Most departments were like that. That is, their primary function was teaching general education courses for students in the traditional “land grant” disciplines: Agriculture and Engineering. In mathematics, there were about a half dozen professors who had done research: the Head, Ralph Hull; Arthur Rosenthal, former Dean of the Faculty at Heidelberg University and a refugee from Hitler; Michael Golomb, from Berlin with a similar reason for being in the U.S.; Howard Hughes, Aubery H. Smith, Merritt Webster, Arthur Trabant, Cleota Fry and a few others who didn’t stay long after I came in 1954. The star of that period was Lamberto Cesari from the University of Pisa. I took courses from all of these except Smith and Fry. Golomb was the best teacher I had and his course “Mathematical Physics” brought all that I studied together into one homogeneous whole. Hughes was solid, but stodgy; Webster pretty much the same. Trabant was inscrutable until I found the book he copied his notes from. Hull was the worst. I always said he spent “six inches” in preparing his lectures. That is, he started thinking what to teach when he reached the door to the classroom and finished when he was through it. This frequently led to an hour fumbling for the proof of a “well-known” theorem, which he thought we should all know. Later, of course, I came to call all these people by their first names except Ralph Hull, who had departed by the time I finished the Ph.D. degree.

A humorous incident involving Hull and fellow graduate student Jack Forbes occurred at a time when Hull was on leave and Jack was sending him material from his dissertation for approval. In one large batch, Hull noted near the beginning that he didn’t like a certain terminology. From time to time, in this batch of writing, the same terminology came up, prompting similar comments. Finally, Hull wrote: “I wish you would stop using this terminology.” Of course, Jack had had no chance to modify it as all occurrences were in the same writing.

Arthur Rosenthal was an interesting person. He had been a student of C.L.F. Lindemann,



who proved the transcendence of  $\pi$ . According to contemporary press, he had been Dean of the Faculty at Heidelberg University before coming to the States. Having gotten his degree in 1909, he was a contemporary of many of the great names in the foundations of modern analysis. He often told amusing anecdotes about some of these persons. My great regret is not having recorded any of them. Rosenthal and Golomb were brought to Purdue by William Leake Ayres. Ayres was head of the department in 1941 and later Dean of the School of Science, Education and Humanities.

In 1955 I was one of those who complained about a calculus text we were using. It contained several errors of importance in understanding limit concepts among others. As a result. I was appointed to a committee to select a new book. I was also preparing to take the Qualifying Exams, a preliminary to starting thesis research. Because of my textbook committee work, Arthur Rosenthal, Acting Head (1955-56), thought I should put off these exams until the next semester. Although I felt that I was ready, I acceded to his suggestion. The book we selected was the first of the new approach to calculus instruction, combining the elementary functions and coordinate geometry with calculus. Previously, the freshman year had been Algebra, Trigonometry and Analytic Geometry, with Calculus in the Sophomore year. The new text was by Johnson and Kiokemeister.

I was a little unusual as a graduate student. I was older, a war veteran and returning from a successful, though short, career in applied research. This got me some respect that I probably didn’t merit. Harold Jonah, in his wisdom, saw to it that I was put in an office with Lamberto Cesari. It was then natural that I should choose him to be my major professor and he accepted me. At

that time our office was on the first floor of Purdue Hall. In 1964 Purdue Hall was razed to make way for the new Mathematics Building.

There was a great shortage of space for the Mathematics Department. Most people were in the Recitation Building, but others were scattered around the campus. The fourth floor of the Recitation Building had, in an earlier era, provided hand ball courts and showers for the faculty. By the 1950s these were no longer used and the space was converted to windowless offices. Cesari and I were moved to an office thus created which we shared with Lincoln Turner, another of Cesari's students.

One night, during an electrical storm while Cesari and I were working, the lights failed and Cesari and I had to feel our way to the steps to leave the building. There were no emergency lights at that time.

My fellow graduate students told me Lamberto considered me "the big man from Industry." He wanted me to call him Lamberto from the start. I couldn't do that. With his guidance I did finish my course work and the research for and writing of my Ph.D. dissertation. After the final exam over my dissertation, he asked: "Now will you call me Lamberto?" I did.

Lamberto was very enthusiastic about our work. He always exhibited great tenacity about everything, if not finesse. He often thumped the desk and said: "Bill, if we don't prove these theorems, nobody will!" He referred to our background in the field, but it could have meant something else.

I completed the work for the Ph.D. in August, 1957. (See Page 252) My thesis topic was "Existence theorems for periodic solutions of systems of differential and differential-difference equations." The final examining committee consisted of Professors Lamberto Cesari, Michael Golomb, Howard K. Hughes, E. Arthur Trabant, and Calvin R. Putnam. This committee was appointed by Professor Carl F. Kossack on July 14, 1957.

As a humorous note on the defense of my dissertation there is this. After I had talked about my thesis for about a hour and three quarters of a two hour period, the thought occurred to me: "The time is almost up. what can they do to me now?". One member of my committee did note that I misspelled "Lebesgue" as "Lesbeque."

I had taken a leave of absence from NAFI, when I returned to graduate study, in the fall of 1954. I returned to NAFI to work during the in-

tervening summers until I completed the Ph.D. degree in 1957. It was during one of those summers that I did the work for which I received the Meritorious Civilian Service Award. In 1957 I resigned from NAFI to accept a position as Assistant to the Head of the renamed Department Mathematics and Statistics at Purdue University.

We had rented 1536 East 73rd Street to a couple. They had trouble keeping up the rent payments. This made me pretty sure I didn't want to be a landlord. The husband of this couple was killed in an automobile accident. His wife collected the insurance, paid the back rent and moved out. We continued to rent the house until 1964 when we engaged Mrs. Gambill, Bob's mother, to sell it for us. We then liquidated the rest of our indebtedness to Herb Bailey.

Others who studied for the Ph.D. while I was there include: Bob Gambill, Jack Hale, Ralph Niemann, Jack Forbes and Walt Wood. All had successful careers. Jack's was great academically; Walt did well as a technical entrepreneur.

Bob later returned to Purdue where, in addition to mentoring several Ph.D. students, he was a valuable member of the department administration.

Jack Forbes ended up at one of Purdue's Regional Campuses and wrote several successful high school text books.

Ralph Niemann and his wife Lois became and remain close friends. Ralph was ahead of me in graduate studies, but was delayed by being called up for duty during the Korean War. Ralph combined teaching with a successful venture at raising Black Angus cattle near Fort Collins, Colorado. I was fortunate to be asked on several summers, to lecture to Ralph's Institutes for teachers. We enjoyed Colorado very.

Walt asked me on a couple of occasions to join him in his consulting business. I declined. I guess I didn't have the nerve; the university provided a more secure environment.

While living in FPHA 213-3, Lou typed an Algebra book for Professor M. Wiles Keller. This had to be typed, error free, on camera ready forms. She typed it on her old portable typewriter without a tab key. She recalls that she was paid 25 cents per page for this job.

At 120 Sylvia, Lou worked for two biology professors. Charles Porter worked on preventing molds and fungi on plants. Richard Armacost directed biology students preparing for teaching careers.

During these years, we again attended the

Baptist Bible Union. In all these experiences with Baptists, and especially at the BBU, I became more and more put off by the attitude that if one didn't completely agree with theology of that local church, one was a heretic. After the BBU closed its doors a few years later, I no longer participated actively in any church although attendance continued to be part of our life.

This phase of life concluded with a trip to Pennsylvania State University to deliver a paper on my thesis at the Summer Meeting of the American Mathematical Society. We, along with several other math families, camped in nearby Black

Moshanon State Park. We took Lou's mother with us and dropped her off near Butler Pennsylvania to visit some of her relatives. On the return trip, we drove non-stop from Butler to Moline, dropped off Lou's mother and drove to West Lafayette.

I was about to enter a new phase of my life - which I describe in the Chapter *Professional Life Starts*. Because I was to have a higher salary, we rented a slightly larger apartment at 118 Sylvia Street. This was in the same converted house. We also bought our first TV, Black and White, of course.

## Professional Life Starts

*August, 1957 – August, 1964*

I think of the Fall of 1957, when I received the Ph.D. degree, as the time when my professional life started. I have been able to supply much more detail about my life for this period. It isn't that my memory suddenly improved that enabled me to write so much detail; rather, I kept an enormous file of correspondence from the period.

Professor Meyer Jerison (Jerry) and I often talked of writing a history of the department. Unfortunately, Jerry was taken from us before we had the opportunity to carry out our dream. I am sure he would have added a valuable component to the following account.

From the Fall of 1957 through the Summer of 1964, at least, my professional history and that of the department are deeply intertwined.

The reason for this claim is the following chronology of my assignments from September, 1957 until June, 1964.

**September, 1957** Assistant Professor and Assistant to the Head of the Department of Mathematics and Statistics

**May, 1958** Associate Professor and Executive Assistant to the Head of the Department of Mathematics and Statistics

**September, 1959** Acting Head of the Department of Mathematics and Statistics

**March 2, 1960** Professor and Head of the Department of Mathematics and Statistics. Resigned effective January 31, 1961

**March 9, 1961** Paul Chenea Acting Head of the Division of Mathematical Sciences; I assisted with daily routine without title

**September 25, 1961** George Hawkins acting Head of Division of Mathematical Sciences: W.R. Fuller, M. Golomb assisting. Mail to Math in care of W.R. Fuller

**February 1, 1962** Assistant Head of Division of Mathematical Sciences

**September 1962** Chairman of the Department of Mathematics within Division of Mathematical Sciences

**Spring, 1963** Assistant Dean of the new School of Science.

**June, 1963** Acting Head of the Division of Mathematical Sciences. This terminated with the arrival of Gerald MacLane in July, 1964

Carl F. Kossack came to Purdue University in 1947 as Professor of Mathematics although he was a Statistician. He was instrumental in bringing digital computing to Purdue. He became Head of the newly combined Department of Mathematics and Statistics in the Fall of 1957. A brief history of this period at Purdue can be found in his *Memoirs* in the Department of Statistics at Purdue.



*C.F. Kossack*

Because of my applied research experience with the Navy, Kossack asked me to stay on at Purdue as an Assistant Professor of Mathematics, with the additional title: Assistant to the Head. I suppose I had a formal offer of this position, but the only paper I can find was Carl's memo of August 24, 1957, to President Frederick L. Hovde notifying him that I had completed the requirements for the Ph.D. and that I would be an Assistant Professor with a salary of \$7,200 per year as per the 1957-58 budget. (See Page 202)

In May, 1958, Kossack wrote to President Hovde promoting me to "Executive Assistant to the Head of the Department of Mathematics and Statistics. This memo was endorsed by Dean W.L. Ayres. (See Page 203)

My job was to help develop a Sponsored Research program in the Department. I encouraged faculty members to write research proposals and conveyed these to research supporting agencies in Washington, DC. Purdue Mathematics was largely unknown in research at that time although Purdue had a student body of about 15,000. Purdue was thought to be a small private school. My job was to change that image so far as financial Washington was concerned. It was rather interesting work. Aside from a couple of memos about specific cases, I didn't keep a record of proposals submitted or the results. I made regular visits to the National Science Foundation (NSF), the Office of Naval Research (ONR), and the Air Force Office of Scientific Research (AFOSR). NSF was a new organization with a budget of about \$3,000,000.

A few years later the University formed an Office Of Sponsored Research within the Purdue Research Foundation to handle such matters for the entire university.

Each grant brings to the university certain added costs. If the researcher is relieved of teaching duties, for example, then a new person must be added to take up that duty. Moreover, both individuals require space, heat, light, etc. The ac-

cumulation of these costs is called “overhead.” The NSF, in 1957, granted 20% of direct costs as overhead. Other agencies gave various amounts.

These years were a battle ground on the subject of overhead. Principal Investigators did not understand why the university deducted from their grants for doing what they were hired to do – original research. Business Officers faced the problem of providing physical resources for both the research and the teaching functions. Endless dialogue between these disparate groups did not bring understanding to either; but the business officers won in the end! An important reason was an organization – The National Association of College and University Business Officers – came into being in this period and won the day.

Dr. William Leake Ayres was Dean of the School of Science Education and Humanities (SEH) of which the Department of Mathematics and Statistics was one Department. He had been a mathematician at the University of Michigan before coming to Purdue. It seems that he was well respected as a mathematician. As an administrator, however, he was a “micro-manager.” My appointment as Carl’s assistant gave me my first view of this attribute of his. Office space was in very short supply. I used 2 foot by 4 foot by 7 foot supply cabinets to separate off a cubicle for my work in a corner of a large room on the second floor of the Recitation Building, the principal home of the Department. Carl ordered a telephone for my use. Ayres came, personally, to see where the telephone would be placed.

I suspect that Carl didn’t fully understand the European psyche. He issued an organization chart which showed me, as Coordinator of Sponsored Research, at the head of the research professors. My major professor, Lamberto Cesari, joked about me moving from being his student to being his “boss” overnight. I wasn’t his boss, or that of anybody else, but the chart suggested otherwise. Lamberto shortly thereafter accepted a visiting appointment at the University of Michigan and ended up staying there.

I continued in this job for two years. Several faculty members applied for and received grants. In the process of developing guides for developing the budgets for these applications, I found that I had some organizational skills. I don’t remember having been called upon for them before. At NOPI, I did write proposals, but they were more for use by the NOPI Commanding Officer in requesting funds, as part of an organizational proposal, from the Naval Bureau of Ordnance.

In the Mathematics Department in 1957, we were not “hi tech.” I found an ancient dictating machine called an EdiPhone. It was strictly mechanical. By speaking into what looked like an old fashioned Ear Horn, one’s voice activated a diaphragm to which a stylus was attached thereby inscribing appropriate grooves on Bakelite cylinders. My secretary found the scratchy quality of this medium intolerable, so I started dictating directly to her. I preferred the other approach because I could stop to think out what I wanted to say before committing to audible sound. Learning to cope with face to face dictating at that time stood me in good stead later.

During this period as Assistant to the Head, I taught two mathematics courses each semester. The typical load was four courses involving 12 to 18 hours in the classroom per week plus the usual other associated duties of a teacher. Typically, I taught Calculus or Differential Equations. As I mentioned before, having obtained the Ph.D. degree at age 37, I did not aspire to a research career so did not request graduate level courses in which I would have generated graduate students.

I didn’t discuss in the previous chapter how student registration was accomplished. The departmental part of this was handled by Professor H.F.S. (Harold) Jonah. Working with user disciplines, Harold decided what courses and how many sections of each course to offer and the number of spaces required at each time period. The Registrar prepared an appropriate number of class cards on standard “IBM punched” cards. At registration time, boxes containing all these cards were delivered to the Armory where they would be handed out by departmental representatives. There students, who had consulted with their advisors, came to try to fit together a schedule which gave them the courses they wanted at times which worked best for them. Only so many students were allowed in the Armory at one time, so there were frequently lines of up to a block long outside. Inside the students went from department to department, picking up at each a class card for the class and hour desired. Since some sections had filled before a student arrived at his/her department’s table, this necessitated returning a card which caused a time conflict for one that wouldn’t. When a student completed a “deck” containing all desired courses and free of time conflicts, these were delivered to a representative of the Registrar’s Office. From these decks, each student’s class schedule was printed. The night before classes began, boxes of the cards selected

by students, and sorted by course and time, were delivered to the departments. During that night, Harold Jonah assisted, as I recall, by Cleota G. Fry (and probably Wiles Keller and Aubry H. Smith) divided the cards into class size packets for each course. These class size packets were then assembled into teaching assignments for the faculty and TAs. With few exceptions, only those teaching graduate level courses knew before the morning classes began what, when and where they would be teaching. Of course, an effort was made to accommodate requested times and courses.

On October 14, 1957, the Russians launched Sputnik I. This was the first artificial earth satellite. That the Russians beat the U.S. to it caused profound examinations of U.S. policies and especially the role of education. The failure of instruction in mathematics and physics became the “whipping boy” for our national failure. Vast sums of money poured from the federal coffers to “fix” this. The “*New Math*” was one of the consequences. The basis of this activity was that a deeper understanding of the foundations of mathematics would lead us to regain our rightful place as the world’s technological leader.

The new math caused great consternation because the teachers were not prepared to understand the concepts they were now called upon to teach. Parents were upset by their inability to help their children with home work. This was brought home to me one day when I was met at the door by Lou and Jim with the question: “Why do they need the empty set, anyway?”

It was clear that massive re-education of teachers was necessary. The NSF, under a congressional mandate, established a program of Summer Institutes for school teachers to bring them up to the required level. We applied for and received several grants for teacher preparation. Carl and I also visited several corporate and foundation headquarters seeking more funds for this purpose. The NSF was our primary success. Summer Institutes for high school teachers sponsored by the General Electric Company had been going on for some time under the direction of M. Wiles Keller and these continued into the “*Space Age*.”

Sometime that Fall of 1957, the university Television unit approached the department about presenting a program on mathematics for a general audience. The program was to be developed at Purdue and broadcast over WFBM Television, Channel 6, Indianapolis. Jack Forbes and I agreed to work on this. We worked with John Glade from

the TV unit and developed a “pilot” program. The pilot had to do with Möbius Bands. These bands are formed by gluing the ends of a strip of paper together after giving one end a half twist. This forms a surface that is one-sided in the sense that a pencil mark traversing the strip the long way returns to the starting point with the mark on both “sides” of the loop. Cutting a Möbius Band along its length at varying distances from the sides also produces interesting results. Try it.

The pilot was, of course, presented live. There was no tape in those days. We had to go down to Indianapolis to the station to present it. Afterwards, we went with John and Bill Fall, WFBM Program Manager, to the executive offices. There we found the senior management, like so many school kids, busily exploring the various properties of these strange surfaces using tape pirated from the office adding machines.

Evidently, our pilot was a success. We were invited to present 13 programs on succeeding Sunday evenings in the Spring Semester of 1958. These involved aspects of mathematics not ordinarily covered in the standard classroom. The program was titled *Its All In Your Mind, an Adventure in Reason*.



*Bill Fuller and Jack Forbes on the set*

During the week, working with the Purdue TV Unit, we developed the theme, graphics, etc., for the next program, in West Lafayette and then drove to Indy to air the show. In spite of being on at the same time that “*Lassie*” was being shown on another channel, we did have some following.

The experience of sitting in the Lobby of the station waiting for our time to go on and being recognized by a young boy, who was there with his parents for some reason, was fun. We occasionally had High School classes and teachers in the studio

and that was interesting also.



With producer John Glade from Purdue TV Unit

Director of Admissions, Harlan White, wrote a laudatory letter to Dean Ayres, complimenting us on a good representation of Purdue. The station wanted us to continue for another 13 weeks. However, the university wasn't willing to reduce our other duties and the station wasn't willing to pay. If you are willing to give your time away, it is probably worth what you get for it.

Jack and/or I reported to the Indiana Section of the Mathematical Association of America at the May 3, 1958 meeting at Ball State University. An abstract appeared in the October, 1958 issue of the Mathematical Association of America (*MAA Monthly*).

In another brush with television in 1958, I taught some sections of calculus via closed circuit TV while other colleagues taught similar sections conventionally. Testing revealed that there was no significant difference in performance between the student taught in the two different ways. The televised instruction did not rate highly with the students. Along with testing "large lecture" methods of instruction, this was an effort to approach the problem of many students to teach, while attempting to bring the teaching load into line with major universities.

Merrill Shanks wrote a report on this which appeared in the June-July issue of the *Monthly*. He generously listed John Dyer-Bennett, who taught the convention sections, Warren Seibert, who did the statistical evaluation and me as co-authors.

On May 13, 1958, Carl wrote to President Hovde that he was promoting me to Executive Assistant to the Head of the Department effective July 1, 1958. I don't remember what additional duties were involved.

In retrospect, it is symptomatic of Carl's problems with Dean Ayres and problems which

I later inherited, that these promotions were arranged directly with President Hovde and bypassed Dean Ayres.

Carl had a sort of advisory committee. I don't recall who all was on it. I believe Merrill Shanks, Michael Golomb, Bob Oesterle (math education), and Virgil Anderson were on it. There really wasn't anyone in computing on the faculty. Duane Pyle, a graduate student, was director of what called the Statistical Computing Laboratory; perhaps he was part of this group. I met with the group also. Around the department it was referred to as the "Kitchen Cabinet."

As a minor activity, I chaired the department Christmas party in 1958. To accommodate a variety of religious beliefs, I secularized the party by calling it a "Holiday Party." The party was held at The Trails. This was also a first as the Purdue Memorial Union had been the usual venue.

Carl Kossack's tenure as head was rather brief. He had wanted to make changes in the operations of the department to bring it into line with research departments in major universities. He also wanted to develop a strong department including pure and applied mathematics, statistics, computing and teacher education (He used the term Mathematical Sciences to describe his goal). He thought he had President Frederick L. Hovde's blessings to do this and perhaps he did. Dean Ayres did not seem to be in agreement with these goals. It is hard for a president to work directly with a department head, bypassing a dean. At the end of my second year, 1958-1959, Carl gave up and left Purdue. Later on President Hovde found a way to "get around" Dean Ayres in dealing with the mathematics department.

During those two years, I had apparently demonstrated some administrative ability. However, I was extremely surprised when Dean Ayres



asked me to become Acting Head of the department while he carried on the search for a replacement for Carl. I was not prepared to supervise faculty members. They, armed as they are with tenure, can be quite independent. I, on the other hand, with 15 years of successes (starting with my admission to Officer Candidate School) behind me, had great confidence in my ability. So I accepted this position. At about the same time I received a promotion to Associate Professor. A letter from President Hovde related that the Board of

Trustees had approved it on March 18, 1959. The promotion and new salary became effective July 1, 1959. (See Page 204)

At that time at Purdue, this was the way many promotions occurred.

Along with my new status came a very interesting opportunity. With a group of eight other Purdue faculty members, I was invited to spend the month of August, 1959, at Cape Canaveral working as a consultant for the RCA Service Company in advance of the first manned space flight. This phase, a sub-orbital flight, was known as Project Mercury. This was concurrent with my becoming Acting Head of the Mathematics Department.

This project originated with a letter to Dr. Thomas Jones from Dr. B.(Blair) W. Sparks. Jones was the Head of Purdue's School of Electrical Engineering and Sparks signed the letter as Manager, Data Processing Planning at the RCA Service Company, Patrick Air Force Base, Florida. The date was 24 March, 1959. Sparks was a Purdue graduate but I don't recall the circumstances of our original association.

The original proposal was to establish an AMR (Atlantic Missile Range) Advanced Problems Laboratory. The embryonic concept seemed to be an effort to establish a graduate program for AMR staff to work for the Ph.D. in Electrical Engineering, but also to provide for consulting arrangements with individual Purdue faculty members. It appears that no formal arrangement was deemed necessary as degree candidates were to meet eligibility requirements of the University. Requirements about returning to AMR work at the end of the degree programs were involved, but these were private arrangements between AMR and personnel involved.

In the next few weeks this project focused on a proposed visit by a number of Purdue faculty to Patrick Air Force Base near Cocoa Beach, Florida. A group of nine individuals, myself included, was decided upon. We were to be called the Purdue Advanced Problems Team. I received my invitation to participate in a letter from J.M. Hyndman dated May 7, 1959. We were to advise on AMR problems and determine the relevancy of Purdue programs for graduate study as outlined in the original draft.

We were to be at Patrick Air Force Base during the month of August. I requested to use my vacation time for this project. Approval was not automatic. Dean Ayres felt that vacation should be vacation; not just work in another site. I con-

vinced him that the project would provide a refresher for me and an opportunity for a connection that could produce graduate students. It also would provide needed income as we had just bought what would be our home for the next 40+ years. He approved the idea.

I had thought that we were contracted with as a group of individuals. When it developed that we were being called the Purdue Advanced Problems team, I was embarrassed. I apologized to President Hovde, who assured me that there was no way we would not be identified with Purdue and all we could do was to do our best to represent the school.

I did not preserve copies of my reports at the conclusion of the month. My drafts indicate that I reviewed many of their in-house reports for consistency and omissions. I also proposed an Educational Plan for RCA/MTP (MTP = Missile Test Project). The purpose of this was to avoid stagnation and ensure that relevant ideas from pure researchers found their way into the thinking of management and staff. In particular, I observed that there was no Mathematical Section in the Canaveral Complex.

I proposed the establishment of an in-house education program under the auspices of a Professional Development Committee. Some components were: Basics of Physics and Mathematics for technicians, updates for engineering staff, graduate degree programs (as a recruiting tool and for competence), establishing a "center" near a major university for RCA/MTP work but also for graduate study for selected personnel. I don't know if anything came of this. The whole activity may have been a big "boondoggle," but a pleasurable one.

I also talked with them about management matters. The management was always complaining that no one was around in the afternoon. I pointed out to them that their recruiting offered "work in a vacation land." What did they expect, I asked?

There was great concern about what would happen if the first "man in space" perished. Not entirely "tongue in cheek," I suggested rerunning films about the early days of aviation when a crashed pilot crawled away from the wreckage of his plane, exclaiming "Be careful of left turns" or some such. These were the kinds of films I watched in the twenties at the Hamilton Theater in Indianapolis.

Others on the team included: T.F. Jones, Head of EE; V.L. Anderson, Director of the Sta-



tistical Laboratory; L.D. Pyle, Head of the Computing Laboratory; P.H. Randolph, Professor of Mathematics and Industrial Engineering; J.H. Abbott and D. Greenspan, Professors of Mathematics; J.R. Lewis and R. Harrison (with whom I previously worked at NOPI), Instructors in EE.

Our visit got a big write-up in both the *Cocoa Tribune* and in the *Orlando Sentinel*.

This activity took place almost two years before Alan Shepard's historic first man-in-space sub-orbital flight on May 5, 1961.

Our interesting interlude ended and I was back in West Lafayette early in September in time for the opening of the Fall semester. I was soon to learn of the difficulties in being head of a large department like ours.

I continued correspondence on the Canaveral educational venture after returning in letters to Blair Sparks and Hal Morris, outlining how some portions of the program might be organized and indicating on-scene facilities available through the Purdue Research Foundation. I have no recollection and no records of what ensued. Actually, one of the problems with administration is the amount of time one spends on projects which never come to fruition. I don't know of anyone on the team having further contact with the project.

Late in 1960 Tom Jones and I were invited to visit the General Electric Company facility in Syracuse, New York, to discuss consulting opportunities. We made one visit. Perhaps Tom continued, but I felt that I was too busy with department problems to start a new activity. Blair Sparks, no longer with the space project, was responsible for initiating this activity.

My naiveté or lack of "political correctness" was, in retrospect, quite astonishing. When Merritt Webster, who supervised the graduate program, told me that the department was "uneasy" about their duties, I sent out a memo saying something like "When I was in the army and a new Commanding Officer took over, he sent out a memo saying 'all standing orders remain in effect until changed'." This military reference was not wise. In November, 1959, I sent the faculty a memo saying it was a "dereliction of duty" to dismiss classes early for Thanksgiving. I had a lot to learn and no teacher except the knocks that come from criticism.

I had moved into the head's office, sitting behind a huge blonde oak desk that Carl Kossack had used. That the department ran smoothly in spite of my inexperience was probably due to Harold Jonah handling the class schedules, Annabelle

Smith (virtually an administrative assistant) handling the office routine, and my not trying to change things too abruptly.

Kossack's goal and my work to improve the level of sponsored research aside, the department had a large "service teaching" load. In addition to courses for engineering students, a variety of elementary algebra courses, tailored to particular needs was offered. Among these were courses for "Home Ec" and for Agricultural students.

Early on in my tenure as Department Head, Assistant Dean David Pfendler of the School of Agriculture came to me about the high failure rate of his students in elementary chemistry. Over a period of years, he had discovered that if an Agriculture student could solve a certain series of arithmetic problems he or she could succeed in the elementary chemistry course. His test included such exercises as  $1/2 + 1/3$  and  $.02/.01$ . I claimed we were just talking about arithmetic literacy. OK, Dave said, but this is what some of our students can't do. Feeling that it was part of our function to help students who had been admitted succeed, I hired a graduate student, off schedule, to come in at 6:00 AM to teach Pfendler's special students about fractions, ratios, etc. I called this "The calculus of rational numbers taught with obdurate sympathy."

On March 2, 1960, Dean Ayres informed the departmental faculty that he was recommending to the President that I be made Head, but he did not write this to the president until March 31, 1960. (See Pages 205, 206).

Dean Ayres reported that most faculty members had expressed a preference for finding someone from the outside to be Head. He said that he had followed up on many suggestions given for filling the headship of the department from outside the university. These had been fruitless, he reported, and hence he had recommended to President Hovde that I be made Head. I believe he also sought a volunteer from among the senior professors in the department. None were willing. Dean Ayres did not include this aspect of the search in his report to the faculty, so my memory may be faulty. (See Page 205)

At that time, he recommended to the President that I be promoted to Professor. I believe he was influenced in this by Associate Dean R. M. Whaley, who felt that a department head should be a full professor. On May 19, 1960, President Hovde wrote me that "The Committee on Faculty Promotions, following a recent meeting, has recommended to me that your academic rank be

changed from Associate Professor of Mathematics to Professor of Mathematics, effective 1 July, 1960. I am very pleased to approve this recommendation." He also set my salary for 1960-61 at \$13,500 per year. (See Pages 211 and 226)

My appointment to the post of Department Head was a bad move on Dean Ayres part. A senior colleague told me in later years that 'outrageous' would be a better term. However, in view of the outcome of the "search" described above, what were his other options? It probably was outrageous of me to accept. I had no inkling of how different university administration was from industrial (i.e., my Naval Ordnance Plant experience). I was also unaware of past departmental problems.

I suppose Ayres thought that as very young person (I wasn't, of course) he would be able to control me. It could also have been disastrous for me, but it actually turned well for me and, I think, for all who survived the ensuing months.

Part of this "control" surfaced when Dean Ayres, arguing my inexperience, offered to (and did) help me construct the salary budget for the faculty for the academic year 1960-61. This "help" came in the form of shaving \$100 or \$200 off several salaries that I had set for the next year. Later I learned that this was standard procedure for Ayres.

The department had long been a "revolving door." That is, a large number of mathematicians had come and gone. At least 65 faculty members had come and gone between 1944 and 1960. (See Pages 229-232) Some of these became notable in our profession. In the spring of 1960, nine faculty members had stated their intention to leave Purdue. More were on the verge of doing so. I faced real difficulties in having enough "warm bodies" to teach our courses in the coming year. It was one of the most tense periods of my life. As late as May 23, 1960 we were facing a shortage of staff which I estimated to be 8 to 10 faculty members in a memo to Associate Dean R.M. Whaley. (See Page 208)

The situation was exacerbated by an article in a recently formed "underground" campus newspaper, *SPECTRUM*, which in its second issue on May 20, 1960, ran a story under the headline: **Math Department in Flux; 7 profs resign, 11 leaving.** In the article Ayres claimed that "not enough Ph.D.s were being turned out and many vacancies exist in math departments." The article referred to a "growing discontent with the lack of autonomy of the department." Mel

Henriksen referred to a "lack of feeling of dignity and John Dyer-Bennett, one of those leaving, commented that it would be a mistake "to think there were nothing more than the results of an acute shortage of mathematicians." The article concluded by stating that a number of professors agreed with Michael Golomb who said: "I am convinced that the situation is recovering. Those who stay are making a positive effort. Dr. Fuller's appointment is in line with this improvement."

I should comment that this was a time when many universities were attempting to expand. Offers were easy to come by and often used as leverage for better salaries at the home institution. In fact I used the term "grand national permutation" to describe the effect nation-wide.

Having not been happy with Ayres "help" with the budget, I proposed immediate additional salary increases for several faculty members for 1960-61 and promotions for three of them. Through conversations with top advisors to the President, I had prepared the way for these proposals. Hence, Dean Ayres concurred and endorsed my letter to the President. The president agreed and instructed Vice President and Treasurer Lytle Freehafer to make the changes effective July 1, 1960. This action averted more losses, but did not improve my relations with Dean Ayres. (See Pages 207,208)

A major appointment for the 1960-1961 school year was Harley Flanders, a mathematician of some stature. Meyer Jerison was instrumental in getting him to come. To enhance our offer I agreed to put him on the payroll a month before he came, in lieu of moving expenses, which we didn't pay then. In return, he was to recruit graduate students for us from Berkeley.

This turned out to be a "no-no" and I was called to Mr. R.B. Stewart's (he was known campus wide as R.B.) office for a lecture on how one could and could not commit State money. Funds from the Purdue Research Foundation covered this expenditure; I did not suffer; and Purdue got a young "name" mathematician. Had I asked for permission, it wouldn't have happened. Stewart was Vice President and Treasurer of the University. His influence probably exceeded that of President Hovde.

I was so proud of the Flanders acquisition that I wrote the President praising the cooperation I had gotten from other administrators in the university which, among other things, had included a position for June Flanders in the School of Management. (See Page 213)

Also, with the help of several faculty members, I managed to recruit 11 new faculty members for the fall of 1960. In addition to Flanders there was Robert A. Gambill, Louis J. Cote (probably arranged by Karl Kossack), Robert Kane and James Lillo who continued at Purdue for many years and made significant contributions to the department and university. Others added that Fall included: R.L. Blair, M.W. Carter, G.J. Rieger, A.R. Amir-Moez, and R.M. Stemmler. J.H. Michael was brought in as a visiting professor from Australia.

The principal offices of the Department of Mathematics and Statistics were in the Recitation Building, but faculty members had offices in many buildings scattered around the campus. In the Recitation Building 600 square foot class rooms had been divided into three 200 square foot offices. Most of these housed at least three faculty members. In around 1955 or 1956, the attic of the building, which had once held handball courts and showers, was converted into offices. Naturally these were windowless. Each pair of offices shared a telephone which was placed in a small box opening to each office.

Lincoln Turner and I had moved into one of these offices with our major professor Lamberto Cesari.

In thinking about our office problems in 1960, I conceived of adding two wings extending out to the West from the Recitation Building's stairwells and presented this idea to Treasurer R.B. Stewart. While discussing this idea with a faculty member outside the building, Dean Ayres came by. When I explained what I was proposing, he observed that I was wasting my time for when the University thought we needed more space, they would provide it. R.B., on the other hand, wrote me a nice report on September 23, 1960 about possible problems from a physical plant viewpoint, but indicated that further study would be conducted. While nothing came of the idea, R.B. at least appeared to consider it. (*See Page 212*)

Unfortunately, for my relationship with Ayres, I shared the views Carl Kossack had had for the development of the department. In the Fall of 1960, I started a series of meetings with the Professors to map a strategy for the development of the department. In a memo dated October 18, 1960, I wrote Professors Anderson, Burr, Dwinger, Flanders, Goffman, Hughes, Jerison, Keller, Putnam, Reiter and Shanks: (*See Page 213*)

"This is to invite you to a coffee for the Full Professors in my office this Wednesday,

October 19, at four o'clock. I hope this will be the first of a series of, say, biweekly meetings. The purpose will be to provide a forum for the discussion of departmental problems and aspirations."

On one occasion I invited Dean Ayres to meet with us at one of our regular meetings. He declined. Later Saunders MacLane indicated that it was impolitic to invite the dean at a time I set. Again my naiveté showed. There may have been another reason for declining the invitation to meet. A colleague whose time at Purdue predates mine, told me that it was Ayres practice to meet with Professors one by one, even if several were summoned for the same time, and then make his decision. Consensus did not seem to be important.

To help reduce the teaching load for the professorial staff, I proposed adopting a "lecture-recitation" method of instruction. I appointed a committee headed by Merrill Shanks to work out the details. This was one of the ideas that Carl Kossack had considered to reduce teaching loads and make more money available to hire staff and improve salaries. I once proposed that I could teach the entire Freshman class in the first semester of Calculus in Loeb Theater.

Shanks' committee proposed using lectures of 200 students with recitations sections of 15 students taught by TAs. One lecture was to be a full load for a faculty member, with four recitation sections each meeting two hours weekly the teaching load of a half-time TA. The proposal estimated a doubling of Teaching Assistants from about 40 to 79; and approximately 25-30 new professorships. These proposed staff increases were accompanied by requests for additional office space.

After working with the Professors in the department to develop a plan, I submitted a memo to Dean Ayres for this development. The essence was for development in Applied Mathematics (proposed earlier by Michael Golomb and Alan Perlis); statistics, probability and game theory; to develop a program in computer and information science (There were as yet no such departments anywhere. Purdue had a background in this area as Alan Perlis and others had been involved in developing programming languages such as ALGOL); mathematics education; and rebuilding in analysis, algebra and topology. In the area of teaching loads, we recommended competing with leading universities by reducing contact hours to 6 for those involved in research.

These proposals are in Memoranda I sent to Dean Ayres on November 9, and November 21,

1960. (See Pages 214 and 215-221)

When Dean Ayres read the proposal, he asked me, kindly, if I would like to have it back. It was “silly,” he said and thought I wouldn’t want to have it in the files. He claimed that the increased funding requested would take all the money the university was likely to get. I declined to take it back and, due to circumstances completely unanticipated at the time, within a few months, we were actually close to what had been proposed.

Of course, by this time my personal relationship with Dean Ayres was deteriorating. I learned much later that my style of meeting with the group of Full Professors was antithetical to his technique. I learned that he rarely talked to any group as a whole; rather, even if many persons were present, he talked to them individually. He then reported his conclusion. I don’t know if it was my style or the content of the messages I was sending him, but we were definitely at odds.

Early in December or late November, 1960, Michael Golomb called me to relate a conversation he had been involved in. President Hovde and Dean Ayres had asked him to meet with them. They told him that Bill Fuller wasn’t “working out” and they thought they would have to replace him. They asked Michael if he would accept the headship. When he asked them if they had talked to me about the situation they replied that they hadn’t. Michael considered this most unfair and hence contacted me. Michael declined this offer. I don’t know whether or not Dean Ayres had a backup plan other than that which ensued in January, 1961. I didn’t wait to see.

I decided to resign the headship of the department (by virtue of my Professorship, I had “tenure.”). On December 5, 1960, I wrote to President Hovde to express my desire to resign the headship of the Department. This was to be effective January 30, 1961. (See Page 224)

Our conflicts with the Dean had, of course, reached the president’s ears because of my frequent conversations with Presidential Assistant John Hicks and other members of the president’s staff. President Hovde told me that my resignation would enable him to “deal” with the situation.

I should mention that John’s practical, down to earth approach and his dedication to Purdue was always helpful to me.

After resigning, but before my tenure as head expired, I assigned myself a small office on the ground floor of the Recitation Building, and ordered a new desk, desk chair and several side chairs. When the purchase order reached Dean

Ayres, he called me to say that the office I had chosen wouldn’t hold that many chairs. We agreed that he would delete some from the order. When I moved into the office, I appropriated the chairs I wanted from the hallway. It really didn’t matter, because I occupied that office for only a few weeks!

Of course, the President accepted my resignation, but his nice letter doing so did not arrive until January 24, 1961. (See Page 227)

Shortly after I became head of the department, I had attended some alumni affair at Butler University. I asked M.O. Ross, Butler’s President, what a president wanted to hear from his department heads. His response: “As little as possible!” I’m afraid that I didn’t measure up to that mandate so far as President Hovde was concerned. Still in later years, he wrote in my copy of *The Hovde Years*: “To Bill Fuller: With thanks for your help & friendship during our years together at P.U.; yours, Frederick L. Hovde.”

A few days after submitting my letter of resignation I was pleased to receive a letter dated December 12, 1960, signed by 51 members of the department stating:

“We, the undersigned, sincerely regret your recent decision to resign as head of our department. Moreover, we are dismayed at the rumor that your resignation was caused in part by dissatisfaction within the department with your leadership. We want, therefore, to tell you that, whatever feelings we may have had when you took over, we now support you whole heartedly and that we appreciate your honesty, integrity, energy, and your selfless devotion to the welfare of our department.”

The signers of this letter are listed at the end of this Chapter. (See also Page 223)

Dean Ayres convened a meeting of the mathematics faculty early in January, 1961, at which time he read a statement which referred to my resignation and told the department that, after conferring with the president, he had asked Michael Golomb to become the Head. Ayres informed the group that Michael had declined this offer. He then said that, on the basis of additional discussions, it had been decided that he should assume the headship on a part time basis. In a multi-page statement, he outlined what the immediate future would hold and ended with:

“I have attempted to set forth here the most important policies which the Department must follow. I hope that my colleagues in the Department can subscribe to them in principal and support them in practice. Much

remains to be done and the goodwill of all of us is necessary to accomplish it. If, however, there are those who cannot honestly subscribe to the policies here stated, those persons should seek posts in other universities. I urge all of you to cooperate with me in the development of our Department, but I will not beg you to stay if the policies upon which it must be built are distasteful to you."

I considered this closing statement to be both unnecessary and inflammatory. I asked the Dean for permission to reproduce his statement for distribution to the faculty and requested that he sign it. He did both. It was distributed to the faculty in "ditto" form. The full text is quoted near the end of this chapter.

In the Spring of 1961, the staff consisted of 26 persons with the rank of Assistant Professor (including 9 non-Ph.D members) 25 Associate Professors, and 15 Professors, There were 17 Instructors and 50 Teaching Assistants. (See Page 228)

As one can imagine, the turmoil surrounding the events described here led to many rumors. One was that the graduate program was going to be phased out. Without changes in staffing the program could not have been robust, but I know of no proposal to suspend it. Ayres dealt with this in a Memo to graduate students on February 13, 1961, assuring them that, as he had come to Purdue to create such a program, it was unthinkable that he would destroy it. (See Page 229)

This entire time period was one of great tension for me and, I'm afraid, also for my wife, Lou. It was not possible to leave it at the office so great were the problems. Department members were resigning, or going on leave to wait out the storm. I often had serious questions about our ability to meet our teaching responsibilities.

In addition, Lou was pregnant and expected to deliver our third child about the first of February. In spite of this, and Ayres telling me that I "should stay home," I felt that I must attend the January, 1961, Joint Mathematical meetings. Perhaps this was an example of the foolish: "A man's gotta do what a man's gotta do!"

I made plans on January 23 (Lou remembers this date) to fly to Washington to attend the meetings for a day or two. Nature had somewhat different plans for about midnight Lou said we really should go to the hospital. James Holbrook Fuller was born early on January 24, 1961. Looking back, it is difficult to believe that I left Lou and our new son in the hospital, and our other sons in the care of my father, and went to the meetings. I don't

recall that I accomplished anything there except to fulfill my need to be in on the action!

Harley Flanders went to the January Joint Mathematical Meetings in Washington, DC, wearing a name tag which read "AVAILABLE." He was vocal in spreading the word of our situation.

At the meeting Merrill E. Shanks, who was a Governor of the Mathematical Association of America (MAA), conveyed to the Board the extent of our distress, including reference to Dean Ayres Policy statement. (See Page 230)



M. E. Shanks

The minutes of the Board of Governors state that if the Council of the American Mathematical Society concurred, both presidents should write President Hovde expressing concern and offering to appoint a committee to assist Purdue in resolving the issues. A motion to do this was passed unanimously.

While I was there a minor snow fell, Washington almost shut down, planes didn't fly and I and several colleagues came home by train. In those days, newly delivered mothers could essentially stay in the hospital as long as they wanted, so Lou waited there for my return. I relate this part of the story to illustrate the type of tension we lived under.

Shortly after the Joint Mathematics Meetings, President Hovde invited a group of senior mathematicians to visit Purdue, to talk to the principals and make a report to him. The three were: Saunders MacLane, University of Chicago; J Barkley Rosser, of Cornell University; and G.T. Whyburn, of the University of North Carolina.

My most memorable recollection of their visit to the campus was meeting with them for dinner at Sarge Oaks on Main Street. The restaurant had a small private room that seated about ten persons. Hanging from the ceiling was a single naked light bulb with a green shade above it. The whole atmosphere was conspiratorial and took me back to those clandestine meetings I had with the French Underground in 1944. In attendance, in addition to MacLane, Rosser and Whyburn, were several senior professors and me.

I don't know the exact nature of these visitor's report. However, shortly thereafter, by EXECUTIVE MEMORANDUM No. A-203, dated 9 March, 1961, President Hovde renamed the department as the Division of Mathematical Sciences and transferred it to the Schools of Engineering,

under Dean George Hawkins. Paul Chenea, Vice President for Academic Affairs and former head of the Division of Engineering Sciences, was named Acting Head. (See Page 236)

Michael Golomb and I served as advisors. The President had found the ideal way to circumvent Dean Ayres. I was back at Carl Kossack's oversize desk, handling the daily routine of the department.

I thought this title was to make mathematics parallel with Engineering Science, since that was also the concept Carl Kossack had been pushing and the term may have been known in the Executive Building.

The problems that Paul Chenea faced were epitomized by a letter he received from Professor A.W. Tucker, of Princeton University. Paul had apparently written seeking candidates for positions which needed filling. Tucker wrote that all their graduates had been placed and added "...let me say quite frankly that the opinion of Purdue has fallen so low in mathematical circles that it would be difficult to persuade one of our good young men to go to Purdue." (See Page 237)

Despite this gloomy forecast, Chenea was able to entice some people to Purdue. One of them was a well known mathematician then at a prestigious eastern university. This was not an unmixed blessing. The candidate told us, up front, that he was a "recovered" alcoholic. Lou warned me that there was no such thing, but we were very eager to make a major appointment and I ignored her warning. He did contribute to Purdue, but he also presented a few problems as he proved Lou right.

One such incident occurred at Thanksgiving time one year. My family was at dinner when I received a call from another colleague that this individual was intoxicated and paying an unwelcome visit to the colleague's home where his own family was at dinner. Naturally, I had to leave my family dinner to go to persuade the offender to return to his own home and family.

Also during the late Spring and Summer of 1961, other senior mathematicians accepted positions starting in the Fall of 1961. They were: Samuel Kaplan, John S. Maybee, Manibhai Patel, Daniel Pedoe, Eugene Schenkman and Otto F. Schilling. These, with some younger appointees, brought the faculty up to 13 Assistant Professors, 21 Associate Professors and 22 Professors. This count does not include 9 non-Ph.D. Assistant Professors or any Instructors. While the choices were made by a personnel committee, I carried out much of the personal negotiating.

I was the one who conducted the daily affairs of the department, still sitting behind the oversize, blonde oak desk I inherited from Carl Kossack. This was 1961 and that desk is still very popular with the faculty having been used by Harry Pollard and (in 2001) by Richard Penny.

Following a nation-wide search which ended in August, 1961, Felix (Phil) Haas was invited to become head of the Division. He accepted the offer and moved to Purdue in February of 1962. I believe the suggestion to look at Haas came from Mel Henriksen who had spent a Sabbatical period at Wayne State University while Haas was head there.

Haas was an MIT Ph.D. and Chairman of the Mathematics Department at Wayne State University in Detroit. His background provided him with contacts with many of the leading mathematicians in the country. His vision for the new Division of Mathematical Sciences included most of



Felix Haas

what we had proposed to Dean Ayres. Carl Kossack had started a digital computing program in the Department of Mathematics and Statistics. In the proposals that we had made prior to Haas' coming, the need for more professional help in this area had been noted, but I don't think we envisioned the Department of Computer Science which Haas brought into being. He proved to be an ideal person to lead the new Division in this and other new developments and opportunities.

I was still not out of the loop as on September 13, Dean Hawkins wrote to Vice President Paul Chenea asking, with the concurrence of Phil Haas, that I be made Assistant Head of the Division of Mathematical Sciences effective February 1, 1962. (See Pages 238, 239)

There was also another interim activity covered in a memo from Dean George Hawkins to President Hovde announcing that to relieve Paul Chenea of his duties in the new Division, he, George Hawkins, would become Acting Head of the Division, sharing administrative activities with W.R. Fuller and M. Golomb, and stating that all questions concerning the Division should be addressed in care of W.R. Fuller. (See Page 240)

Phil Haas started his tenure in February, 1962. He launched a vigorous faculty recruiting campaign, resulting in the appointment of 22 new faculty members for the Fall of 1962. As one newspaper put it: "Purdue Hires Two Football

Teams.” Much of our “silly” proposal to Dean Ayres had come to pass!

Haas wanted to be sure to hire all the qualified candidates he could and to help accomplish this, he assigned a probability of acceptance to each. This probability was altered weekly. Based on the delay of acceptance by a particular person, the probability was lowered. “Probability” times “value of salary offer” was never allowed to exceed the money available.

In September, 1962, Dean Hawkins issued Administrative Circular No. 31, the purpose of which was to establish the internal structure of the Division of Mathematical Sciences. Starting in October, 1962, the Division was to consist of three instructional units and two service and research organizations. Briefly, there was to be a Department of Mathematics, Department of Statistics and a Department of Computer Sciences (the first in the country). No one was sure if computer science would become a “discipline” in the academic sense of the word. All of the early appointment in the department wanted to have the title “Professor of Mathematics and Computer Science.” Of course, they were all trained as mathematicians.

There would also be a Computer Sciences Center and a Statistical Laboratory. Sam Conte chaired both computer operations; Irving Burr chaired Statistics; William Fuller chaired Mathematics (for the academic year 1962-63); Virgil Anderson was the Director of the Statistical Laboratory. (See Page 245)

A Center for Applied Mathematics was formed later and mathematics education was shared with the School of Education, another break-off from the old SEH.

Phil Haas’ tenure was even shorter than mine, as it was decided to create a new School of Science in the Spring of 1963. Phil was appointed Dean of the new School. He immediately found it necessary to give up his duties in the Division and, in Administrative Circular No. 1, dated June, 1963, appointed William R. Fuller to be Acting Head of the Division with Otto Schilling and Meyer Jerison as Assistant Heads responsible for graduate and undergraduate matters, respectively in mathematics; Sam Conte continued in charge of the Computing Center and the new Department of Computer Science; Irving Burr in charge of Statistics; and Virgil Anderson in charge of the Statistics Laboratory. While remaining within the Division of Mathematical Sciences, the Computer Sciences Center was to operate under a policy group consisting of Hawkins, Haas and Conte. (See Pages

245, 246)

Gerald R. MacLane, of Rice University, was selected to be the Head of the Division of Mathematical Sciences as well as Head of the Department of Mathematics. The search ended in January, 1964 and during the Spring Semester MacLane made many weekend visits to Purdue to familiarize himself with our rather large and diverse operation. He and I became quite well acquainted during that interval as we met frequently to discuss details.

These arrangements continued until July, 1964, when MacLane arrived in West Lafayette and took up the position as the Head of the Division. I then took up full time duties as Assistant Dean of the new School of Science. My main duties had to do with student welfare and counseling.

Another part of my job was to chair a committee to determine the needs for a building to house the Division of Mathematical Sciences and to write a proposal for submission to the National Science Foundation requesting funding.

In one of my capacities I had been invited to attend the opening of the new Mathematics Building at the University of Wisconsin – Van Fleck Hall. The Walter Scholer architectural firm had designed virtually all campus buildings for many years and would design our building. When it came to the design phase for our building, I took Lloyd Moser, a design architect for the Walter Scholer firm, to see the Wisconsin building. I wanted him to see the open columnar effect of the ground level and especially the elegant “coffee room” on the top floor overlooking Lake Mendota. Looking at our building, you can see that this had some effect, but Vice President and Treasurer Lytle Freehafer insisted that there be no top floor “coffee room.” We were lucky to get our third floor room under the guise of “Staff and Graduate Student Reading Room.”

An interesting and revealing vignette about Walter Scholer’s tastes arose when I complained that offices on the north and south ends of the proposed building had no windows. I argued that putting in windows would not only benefit the office dwellers but would break up the “solid red brick” walls. Mr. Scholer responded: “You know, Bill, that’s just the problem; a solid red brick wall is a mighty pretty thing.” Subsequently, most of these offices did get windows and there were matching ones on the end with elevators which could not be seen from inside the building! As I recall the NSF grant was for \$1,400,000 of a \$3,400,000 building.

These things in place, I applied for and received a Sabbatical leave for 1964-65 although Presidential Assistant John Hicks said he couldn't see why an administrator needed a sabbatical! I spent it at the University of California at Berkeley, and left Purdue in peace for a year.

I shouldn't leave this without a bit more of the back ground of our differences with Bill Ayres. I recognize that he isn't here to give his side; nor are any of his contemporaries in the Dean's Office. However, some "old-timers" say that I have been too kind to Dean Ayres in the above account. They refer to many instances of shabby treatment of colleagues which resulted in significant effluxes of persons who became leaders in our profession. Their names are on the list referred to earlier. (See Page 233)

Although it was never explicitly stated to me, it appeared to me that Dean Ayres desired to keep the Mathematics Department a "Service Department" primarily providing mathematical instruction to the students in the traditional Land Grant College mandate: Agriculture and the Mechanic Arts. In his resignation from Purdue in 1962, he seemed to state otherwise. Quoted in the Purdue Exponent on April 4, 1962, Ayres said, in his resignation letter:

"...you are aware, Mr. President, of deep differences that exist between us with regard to the proper role of the Purdue University in the years ahead. Purdue's past history has emphasized engineering and agriculture with other areas in supporting and service roles, of whatever strength or mediocrity necessary to support the two primary areas. This has been the pattern of Purdue in the past, but it is not even the Purdue of today and certainly must not be the Purdue of tomorrow" The Exponent continued: "It has been my belief that Purdue needs a broader base for its future greatness and that I have been unable to convince you of this." (See Page 243)

The mystery to me is that his actions never indicated his desire for excellence. A reading of Bob Topping's *The Hovde Years or A Century and Beyond* suggests that Ayres' did desire to extend Purdue's involvement in the Humanities.

In spite of burgeoning enrollments, it was always difficult to get Dean Ayres approvals for staff appointments in a timely way. Those who were still in the national pool of mathematicians by August were obviously not the hottest prospects for building a strong department. One of the most egregious of these delays was his frequent

postponement of appointments to meet Casper Goffman, who Lamberto Cesari was interested in bringing to Purdue. This did finally take place and "Cas" had a long career in the Purdue Mathematics Department.

Another complicating factor of those days was the Retired Armed Services Training Program (RASTP). The complication, for me, was from continuing protests from younger faculty members about the lack of mathematical soundness of the curriculum offered the retired officers to earn a Master of Science degree. The adoption of the program had sharply divided the faculty into camps composed of younger Ph. D. faculty and older mathematically active faculty and an ongoing set of older members. The latter were serious about teaching and dedicated to Purdue but, I think, took a position based more on loyalty to Dean Ayres than on dedication to the profession. So intense was the division that some friendships were threatened by positions taken on the issue.

The program was conceived by Dean Ayres in late 1955 or early 1956. I believe the genesis of the idea was a conversation Ayres had with a seat mate on a flight. His companion was a retired military officer.

The idea was based on the fact that most military academy graduates had studied mathematics at least through Differential Equations and hence with a few more courses could be available to teach elementary mathematics courses in the nation's colleges and universities. In view of the dramatic shortages to be faced in the next several years, this seemed to be an idea worth exploring.

The idea was attractively described in the March, 1956 issue of *Shipmate*, the U.S. Naval Academy Alumni Monthly under the heading: **Do You Want a Dignified Position?** The journal asked those with interest to signify that by submitting a form with certain information. (See Page 241)

As an Instructor of Mathematics, I was considered a faculty member even though I was a graduate student. So I was present in faculty meetings leading up to the establishment of the RASTP. For details I rely on a report prepared by Melvin Henriksen for the Graduate Committee. According to this report, Dean Ayres discussed the idea with Cleota Fry, Harold Jonah, Wiles Keller, Carl Kossack, Arthur Rosenthal and Merritt Webster. It was brought to the faculty on April 17, 1956. At the meeting, the above group was joined by Merrill Shanks in recommending the program for adoption. Some thought it too weak and the



committee was augmented by Arthur Copeland, John Dyer-Bennett and Michael Golomb. With some strengthening, the program was adopted by a vote of 22 for and 18 against at an evening meeting on May 2, 1956. Dean Ayres was a participant in the debate and vote.

The program began in the Fall of 1956. The Masters degree was awarded to those completing the program. The courses in the program were tailored to the group and to the objective to prepare the graduates to teach elementary college mathematics.

Ten former officers in this first group completed the MS and graduated during the summer of 1957. Nine of these went into teaching positions (although one did not teach mathematics). A study concerning these nine was conducted by Assistant Professor Robert A. Oesterle.

These teachers and their department heads were asked to complete an "opinionaire." All did. Based on a number of attributes related to teaching, Oesterle found that the department heads ranked the teachers between 3.43 and 4.56 on a five-point scale. All but one was invited back for a second year. Oesterle concluded that, in general, the teachers were considered to be "above average."

The teachers, while indicating some areas that would have been helpful to them, reported their first year experiences to have been enjoyable.

In 1960, after four years and fifty-four Masters's Degrees, M.W. Keller and A.H. Smith conducted another survey. They found that 69% of departments responding to a questionnaire viewed the RASTP in a favorable light. Keller and Smith concluded that the program was fulfilling a need.

The program was never popular with the faculty. The department included several non-Ph.D. persons and others who genuinely sided with the Dean. I do not wish to denigrate these colleagues. They were mostly good teachers and interested in the welfare of the department and of the university. Leaving these out, the RASTP would never have come into existence. I felt that there was much good about the idea, but had no real contact with it until the Fall semester of 1960.

In order to form an opinion based on experience, I assigned myself to teach in the Program. I taught MA 541 (Called Advanced Calculus, but half was a review of beginning Calculus) and MA 533 Differential Equations. In a letter of July 24, 1961 to Mel Henriksen, Chairman of the Graduate Committee, I remarked about the poor showing of the class and their antagonism to me as a teacher. One told me that I was "not a gentle-

man." I had never experienced anything like that before or since. I interpreted the complaints of some as due to my inability to write examinations they could pass. I concluded with:

"It is my opinion that the major difficulties I experienced in my contacts with the RASTP are due to the mathematical immaturity of the students. I feel that they were simply not yet prepared to cope with abstractions of notation and argument. It is my opinion that if they were given sufficient time to mature, before being asked to cope with courses which the instructor at least feels are graduate courses, they might put on a better show. I feel that an additional year might give them this maturity."

There was strong suspicion that Ayres intended to hire a number of the 1961 RASTP class. There is cause to believe this would have happened had the department not been moved administratively to the Schools of Engineering. When Ayres assumed the headship in February, 1961, he used the desk calendar I had left behind for his appointment schedule. When I returned to that office as Paul Chenea's assistant, the calendar was still there showing, in Ayres handwriting, appointments for several members of this class. I preserved the pages from this calendar for several years. Unfortunately, they seem to have been lost.

During the early days (July, 1961) of the new Division of Mathematical Sciences, Paul Chenea asked the Graduate Committee to make a study of the program. A survey of the faculty showed considerable disapproval of the program, but not all in favor of suspending it. Sixteen felt modifications were needed; 18 felt it should be discontinued; 4 offered no opinion. In an undated report, L. Cote, C. Goffman, M. Henriksen (chair), M. Jerison and M. Shanks voted to discontinue the program. M. Webster dissented.

In July, 1961, Dean George Hawkins, at V.P. Paul Chenea's request, asked Dr. Saunders MacLane for an opinion. MacLane responded by telephone after which Dean Hawkins sent him a copy of his transcribed remarks to which he agreed. In summary, MacLane recommended not awarding a Master's degree and offering a certificate instead, and putting more mathematics into the program. If a certificate would not attract students then the program should be discontinued.

Paul Chenea reviewed the copious material on the issue, including a report by Aubry Smith, the Graduate Committee's report, and Saunders MacLane's report. On October 9, 1961, Dean

Hawkins issued a memorandum discontinuing the program at the close of Summer, 1962. Paul Chenea indicated his concurrence by cosigning this memorandum. Hawkins reported that he based his decision on: "consultation with Drs. M.W. Keller, A.H. Smith, M. Golomb, W.R. Fuller, M. Henriksen and other staff members of the Division and after receiving Dr. Chenea's written recommendation." Of course, nothing prevented such retirees from coming to the university for make up work and then pursuing a minimal Masters degree program. I know of none who did.

Several internal studies were made of the RASTP. I have not reviewed them extensively here. My overall impression is that, whatever shortcomings the program and its participants may have had, most of the graduates had rewarding and useful careers in smaller colleges. Some stayed and taught at Purdue for a few years. One of especial interest to me was Roger F. Scott (R Adm, Ret, U.S.N.). Roger, in addition to teaching, was a School of Science Counselor for several years. This was the second time our paths had crossed, as Roger was the one who signed the certificate for the Meritorious Civilian Service award I received from the Navy in 1954 for my work at the Naval Ordnance Plant, Indianapolis.

The Saga of the RASTP ended with the close of the Summer Session of 1962. My file contained several other rather voluminous documents which may be found in the Purdue University Library Archives. The announcement about closing the program came from Dean of Engineering George Hawkins in his role as Acting Head of the Division of Mathematical Sciences. (See Page 242)

As can be surmised by much of the above tale, Faculty participation in Governance was minimal at Purdue and hardly existed at all in mathematics until 1961.

Dean Ayres Memorandum to the Faculty, dated March 2, 1960, indicates that he received suggestions from them as to a possible head and that he compiled a list of more than 30 candidates all of whom were eliminated for one reason or another. There is no indication that any of them was brought to the campus to meet with the faculty. It also states that after further consultation "with several faculty members, Dean Young and Dean Hawkins," he had recommended me to President Hovde who concurred.

I don't know what went on before my time, but at this time, tenure, according to AAUP rules, was usually achieved by default. Probably this was because it was so difficult to obtain approval

for new hires. Once we became a Division in the Schools of Engineering, tenure was taken seriously. I may have been the first in Purdue mathematics to tell an assistant professor that Purdue would not be his/her home for life. The first two were Don Lick and Rosemary Stemmler.

I have not commented on the role of specific faculty colleagues unless I had notes to support my poor memory. Mel Henriksen is one I do remember most from this time. Mel often came to my office for "ten minutes of hate" in a take-off on George Orwell's novel *1984*. I asked him to think positive thoughts while he countered asking me to think negatively. We had many discussions, which I wish I could remember and report in detail. Mel and I remain good friends and share a mutual respect for each other.

Although I was obviously deeply involved in what we old-timers called our "Revolution," I don't consider myself a major player. However, I do wonder what would have happened had I been content to be the head of a mediocre or lower level department. I can easily imagine that, while we would have continued to lose the better people, we would have hired "warm bodies" and met our teaching requirements. So I do credit my work with the professors to build a well-rounded, modern department as part of the catalyst that brought about the changes reported above.

In writing some recollections for Lou's and my 50th wedding anniversary, my colleague Meyer Jerison wrote:

"My most dramatic memory is of your role in our "revolution." Many people contributed to the success of that difficult and, in retrospect, glorious effort. If any single one of them other than you had not been involved, it is safe to say that the outcome would have been the same. But as I have often said, though perhaps not to you directly, if you had not been there and done what you did then I fear we would have had a different history."

The importance of the sequence of events initiated by Merrill Shanks at the January, 1961, Society meetings cannot be over-emphasized.

In spite of the intense period I have described, these events did not fill all my time. In no particular order here are some of my other activities. Some are described in more detail in other chapters.

- During 1958-59 school year I taught in Purdue's off-campus program in engineering education.
- With a group of eight other Purdue faculty

members, I spent the month of August, 1959, at Cape Canaveral working as a consultant for the RCA Service Company in advance of the first Mercury flight.

- Late in 1960 Tom Jones and I were invited to visit the General Electric Company facility in Syracuse, New York, to discuss consulting opportunities. We made one visit.

- I lectured in several Summer Teacher Institutes at Colorado State run by my friend from student days, Ralph Niemann.

- Early in 1966 (February or March), I interviewed for the Deanship of the College of Liberal Arts and Sciences at the University of Connecticut at Storrs, Connecticut. I wasn't offered the position.

- In April, 1966, I interviewed for the Deanship of Arts and Sciences at Colorado State University. I was offered the position but rejected it.

- I interviewed for chairmanship of the Mathematics Department at Buffalo. I wasn't offered the job.

- I was offered the position of Assistant Executive Director of the American Mathematical Society by Gordon Walker. In-fighting I observed on a visit to Providence cooled this for me.

- Some time in the early 60s I reviewed tapes of mathematic lectures for MPATI. MPATI was the Midwest program for Air Borne Televised Instruction. Funded by the Ford foundation and others, the program based at Purdue used a DC 6 flying over northwest Indiana to beam televised instruction to a five state area. The format called for two University of Chicago teachers (as I recall it) to make a conventional presentations, the camera going from one to the other. The material was competently presented, but I objected when the dialogue degenerated to a combative mode between the presenters. I may have been brought into this activity by Bill Fall, former program director for WFBM, who now had a significant role in the MPATI program. As I recall, I got \$50 per lesson for these reviews.

I describe these activities in more depth in the chapter *Life With ....*

Before recording Dean Ayres Policy Statement, I offer a few anecdotes on life in the Department of Mathematics and Statistics in 1959-1961. To open this section, I repeat some background on the department.

In the mid 1950s the Department of Mathematics was mostly housed in the Recitation Building. Originally a classroom only building, several 600 square foot classrooms had been divided into

three 200 square foot offices. Each such office was home to at least three faculty members. At that time the fourth floor of the building was remodeled to provide several windowless offices. Each pair of adjacent offices was connected by a small box in the wall holding a telephone shared by the occupants. In 1956-57 (maybe earlier), I shared one of these offices with Professor Lamberto Cesari and another graduate student, Lincoln Turner. We were working under Cesari's direction.

There was a lounge of about 200 square feet in area in this fourth floor complex. There were many requests to have a "coke" machine in this lounge. I don't recall exactly how it happened, but when I became Acting Head, I managed to get such a machine installed. Not only that, but the department received a share of the proceeds from the sale of Coca Cola. The machine was humorously dubbed the "William R. Fuller Memorial Coke Machine." Needless to say, it wasn't long before the fiscal powers discovered this source of income and started licensing Coca Cola to install machines and gathered the proceeds for the university.

There was a chalk board in the fourth floor lounge, but the offices on that level did not have them. It is hard to imagine a mathematician's office without a chalkboard. When I inquired about having the Physical Plant Department install such boards, it was obvious that our budget would pay for only one or two. However, a colleague showed me an office supply catalog in which chalk boards of an appropriate size could be bought for about a tenth of the university estimate. I shot off a purchase order for the requisite number of boards. The money probably came from our "coke" fund. When the boards arrived I contacted the carpenter shop about installing them. Then I discovered the value of not asking first. "How did you manage to get these boards?" "How do you know they will be strong enough to be installed?" And other questions. However they installed them; they were satisfactory; and so far as I know may still be serving their purpose. I also may have been responsible for some additional checks being mandated on how requisitions flow through the purchasing department.

On the subject of the Purchasing Department, I am reminded of an incident which came later, but shows the administrative mind set. One of the head guys in purchasing explained to me one of the travails of his job. He related that when a new building is to be erected, a space is found where a layout of projected offices can be

constructed. He continued: "We bring in a furniture manufacturer who designs furniture that is 'just right' for the space. We install the furniture, and what happens? The professor moves in and rearranges it to suit himself!"

Every large group must have a "character." I'll call ours "X", for obvious reasons. The first anecdote concerns a wastebasket. The janitor told Assistant Department Head, Harold Jonah, that a wastebasket was missing from a classroom in the Recitation Building. Harold remembered having seen X walking across the campus with a wastebasket on his shoulder. When asked about it, X observed that he always found that wastebasket empty and hence it was unneeded in that classroom whereas he needed one at home. The item was returned to the classroom.

On one occasion X told me, plaintively, that he was having trouble attracting graduate students to work with him. He felt that it was because they had no opportunity to meet him. I suggested that he invite some to his home for an informal "get together." A few days later on the chalk board in the fourth floor lounge, there appeared at the top the message: "Graduate students desiring to see the Xs in their natural habitat, please stop in between 10 and 11 PM on . ." - a date was given.

Perhaps not from this effort, but X did mentor one graduate student who had a distinguished career.

X's success with undergraduate students was close to disastrous. A later Assistant Head, Bob Gambill, considered him part of a small group referred to as "the wrecking crew." That is, if there was a course the department wanted to drop, but was still requested by other departments, assigning members of this group to the course over a period of several semesters would reduce its desirability to zero.

Another incident which had some bad effect, but could have been disastrous occurred when a graduate student jumped or fell from a third floor window in the Recitation Building. He sustained compound fractures in both legs. The broken bones came out the sides of his legs and punched two round holes in the ground where he landed. I witnessed these holes the following morning. He was with a group of other graduate students at the time. It was widely thought that he jumped because of a bet that he could do so without injury. The students stoutly maintained that he was sitting in the window sill and fell. This event occurred on April 23, 1963 my 20th wedding anniversary.

Various experiences led me to coin an adage: **"A university is to sweep"**

This adage was occasioned when the head of the janitors wrote me that professors were using class rooms after hours for instruction. This meant that the first class in the morning wouldn't have a clean chalkboard. Of course, that was the only one that had clean boards anyway. I was told that: "If You can't keep professors from teaching in those class rooms they will be locked up!"

And a concept called:

**"The egocentric theory of the universe."**

This concept derives from the fact that for most people the view of the world starts from their immediate view of how things ought to work.

And, finally, anyone who has attended a lot of committee meetings knows that:

**Punctuality is the thief of time!**

Until 1962, some departmental social life was, essentially, mandated. The department wives had monthly "Teas" at which attendance was considered obligatory. These were not Lou's favorite thing, by any means, but I guess she felt she had to participate because of my position. The Purdue Women's Club was also considered important. These matters were overseen by the Dean's wife, Julliette Ayres. Newly appointed faculty were assigned sponsors from among the ongoing members. It was in this way that we met George and Dorothy Pedrick. Our long relationship with them continued by correspondence after they moved to California where George worked for the Committee on the Undergraduate Program in Mathematics.

As I re-read this account I think I would find it difficult to believe it had I not lived it. How could a person only two years beyond the Ph.D. degree be asked to head a department in a major state school? How could such a person accept the job? How could that person elect not to "sit on his hands" and simply shuffle the papers necessary to survive? How could a faculty presume to tell the administration what kind of department and school should be provided for the people of Indiana? I don't have answers. I just know the foregoing is what happened!

## 1961 Policy Statement by Dean W.L. Ayres

*This statement was not dated. A copy from the Dean of Engineering was time stamped January 17, 1961*

Policy Statement for Department of Mathematics and Statistics "I think you are all aware that Professor Fuller has asked to be relieved of his assignment as Head of the Department of Mathematics and Statistics. President Hovde and I held several conferences and invited Professor Michael Golomb to accept the headship of the Department. This he declined to do. After additional conferences we have decided that I should become Head of the Department of Mathematics and Statistics on a part time basis until a permanent solution can be found inside or outside the Department. I hope this may continue for a short time only, but it will be for the remainder of this year and perhaps for all of next year at least. We must continue this interim administration until the proper person can be identified to give proper leadership to this Department on a permanent basis.

"In accepting the leadership of this Department at this time, I think I should make clear to all of you our belief in certain policy matters that are essential. I should add that President Hovde has read this policy statement and endorsed it fully. You may thus consider it a joint statement from the two of us.

"The Department of Mathematics and Statistics is one of the largest and most essential departments of the entire campus. Its duties include many and various assignments each of which must be performed competently. In considering its total assignment, it seems to me that we must establish the following priorities:

Priority 1. Appropriate and competent teaching at the undergraduate level.

Priority 2. Competent teaching at the graduate level and guidance of graduate student research.

Priority 3. Personal research and scholarship by members of the faculty.

"President Hovde has stated on many occasions that Purdue's first responsibility is the education of undergraduates, and I agree with this attitude whole-heartedly. While I consider that the other functions of the University are important and must be given serious attention, it is my belief that wherever a conflict between priorities forces a choice, the training and teaching of undergraduates must be

paramount. I make this judgment even though I am a strong believer in graduate education and in research.

"Our undergraduate teaching program involves a large service program, primarily to engineering but also to all other schools of the University. In addition to this, we have our own program of undergraduate majors with the development of a small nucleus of undergraduate students who will become the professional mathematicians of the future. We have a need to train undergraduates in the field of statistics to meet the strong demand in industrial and government laboratories. All of these functions are important and must be done with competence.

"The magnitude, diversity and high priority of our undergraduate programs makes it imperative that we have on our faculty many professors gifted in the great art of teaching. We have on our present staff many persons whose primary function is undergraduate teaching with little activity in mathematical research. These are valuable members of our staff and it is desirable to add to this group in the future as well as increase our research staff. While the combination of a gifted teacher and fine researcher is the ideal combination in a professor, such a great scholar-teacher is rare, and we must expect to achieve the desirable balance between instruction and research through the efforts of many people of different abilities rather than to find it in each particular individual. Some members of our faculty today and in the future will be of greatest usefulness at the graduate and research level; others will find their greatest usefulness in the undergraduate teaching programs. Both types are highly desirable members of the faculty and we shall continue to appreciate both types in our current faculty and to seek both in our future additions.

"Priority 2 is graduate instruction and Priority 3 is individual faculty research. These two priorities are closely related and perhaps could be stated as a single priority which must take second place to the undergraduate program but should by no means be crowded out of the picture by the demands of Priority 1.

"Here, the great scarcity of persons capable and experienced in guiding research makes it necessary for us to make some difficult decisions. Probably no Department of Mathematics can cover the waterfront and be first-

class in all research fields of mathematics and statistics. Once you have struggled through the painful decisions with me as to a few areas where Purdue should be outstanding, President Hovde has assured us that there will be money to strengthen these areas. He has assured me that he will given (*SIC*) this department all the financial support possible consistent with the valid needs of other departments and schools.

"This should provide the staff to train our share of future mathematicians and statisticians. But we have several other obligations in our graduate program, each of solid validity and desirable in the overall program of the University. We have to provide the mathematical and statistical training to persons who need these skills as tools in their professional interest which may be engineering, social science, or agriculture. Such programs are vital to the whole University and must be given the best of our abilities.

"Finally, we have the graduate programs concerned with secondary school teachers and with the retired military personnel. Purdue University has been a leader in the former area and a pioneer in the second. Both of these programs are clearly useful in the development of education in the years ahead and must be continued and supported with real enthusiasm. We cannot ignore the secondary school teacher and expect that our entering University students will be properly trained. For this selfish reason alone, our programs for secondary teachers are important. But more than this, we owe an obligation to American education as a whole to bring our best minds into this program.

"Our Retired Officer program was the first one established in the nation and has been imitated at a number of other universities. Its graduates have been sought by colleges and universities across the country. The growing scarcity of Ph.D. mathematicians in the years ahead will increase this demand. This fact alone is a clear signal of the value of the program. In addition, it would not have been imitated in other universities if they had not recognized that the Purdue pioneering effort presented a solid and useful program.

"It is my desire to state in simple terms the various aspects of the program of the Department of Mathematics and the importance of each of its component parts. No individual in this room may be concerned with all of the various programs that I have discussed, but each person must contribute his best ability to those parts of the program for which his training best fits. And each must recognize the importance of the other areas, even though he may not participate in those particular programs. We have a large, important, and varied role to play in the work of Purdue University. Each of these programs is valuable and contributes its bit to the good of the Department and of the University.

"In assuming the Headship of the department once again, I must of necessity work with you on a part time basis. This means that I will need support from each of you in working out the specific policies and practices of the programs, which I have discussed here in general terms. I will welcome your advice and assistance in developing the proper policies which will make these programs a success.

"I have attempted to set forth the most important policies, which the Department must follow. I hope that my colleagues in the Department can subscribe to them in principle and support them in practice. Much remains to be done and the good will of all of us is necessary to accomplish it. If, however, there are any who cannot honestly subscribe to the policies here stated, these persons should seek posts in other universities. I urge all of you to cooperate with me in the development of our Department, but I will not beg you to stay if the policies upon which it must be built are distasteful to you.

"I hope my tenure as Head of this Department will be reasonably short, and that by the end of this next year, we may settle this matter on a permanent basis. I also ask all of you to give me suggestions as to the proper person who can take over as Chairman of this Department."

#### **End of Dean Ayres Statement**

### Signers of supporting letter

Norman L. Alling	Imanuel Marx
Ali R. Amir-Moez	Harley E. McKean
Virgil L. Anderson	Dale M. Mesner
L.G. Black	James H. Michael
Robert L. Blair	Glen T. Miller
Helen Bozivich	Christof J. Nuegebauer
Irving Burr	James Norton
Melvin W. Carter	R.A. Oesterle
Arthur H. Copeland, Jr.	Paul W. Overman
Louis J. Cote	George Pedrick
Karleton Crain	Sam Perlis
Marvin W. DeJonge	C.R. Putnam
Ph. Dwinger	L.D. Pyle
Harley Flanders	Stanley Reiter
Cleota G. Fry	Paul H. Randolph
Robert Gambill	Georg J. Rieger
Casper Goffman	Roger F. Scott
Michael Golomb	Merrill Shanks
James H. Hogg	Edward Silverman
H.K. Hughes	Annette Sinclair
M. Jerison	Morris Skibinsky
Robert B. Kane	Aubrey H. Smith
M. Wiles Keller	Merritt Webster
Earl L. Klinger	G.N.Wollan
Clarence Lane	Robert E. Zink
James C. Lillo	

I was also pleased to receive a letter from Mel Henriksen asking to be added to the list.

## From Here To . . .

August, 1964 – ??

By the Fall of 1964 I would have completed ten rather tumultuous years at Purdue. I had been a graduate student with the rank of Instructor for three of them and for seven of them in ranks from Assistant Professor to Professor. I had been heavily involved in administrative matters as well as teaching, as the previous chapter indicates. Having completed the Ph. D. at age thirty-seven, I had never sought to follow a career in research in pure mathematics, but did feel that I had become rather far removed from the subject. I felt that it was time for a break and decided to apply for a Sabbatical Leave. Under most conditions, such leaves are due to professors after six years of service and, normally, pay half the usual salary for a year or the full salary for half a year.

Dean Felix (Phil) Haas felt that it should be possible to raise the amount needed to make the leave one for a full year. I applied to the National Science Foundation, but there was no program directed toward supporting sabbaticals and my lack of research background did not qualify me for a research grant.

At Phil's request, Leonard D. Berkovitz agreed to put me on his NSF grant for three months and NSF agreed to this use of funds in a letter dated March 20, 1964, from Robert H. Owens of the Mathematical Sciences Section. I had one month of vacation leave due me. These together with the half year at full pay sabbatical leave provision provided me with the nine months salary needed to be away for the academic year.

Thus equipped, I applied to President Frederick L. Hovde for a Sabbatical Leave on May 26. The request was approved by Vice President Paul Chenea on June 8, although presidential assistant John Hicks wondered why an administrator needed such a leave.

M. H. Protter (Murray), Head of the Berkeley Mathematics Department, agreed, in a letter dated March 19, to provide me office space which I would share with another visitor. He also arranged for library and university faculty privileges for me. This he accomplished by appointing me as a Research Associate without pay.

Finding housing was a major problem. Harley Flanders suggested that I contact Sarah Hallam, the departments head's secretary and administrative assistant for guidance. Sarah was one of those people people that keeps things working; the oil that lubricates, the fuel that powers. Wonderfully knowledgeable about campus affairs, she put me

in touch with Ronald Shephard, whose house we ended up renting. See *Life with . . .*

While these activities were continuing I was doing my usual work as Assistant Dean and Professor of Mathematics. I didn't usually teach during the summer, but other aspects of directing the Science Counseling Office and preparing for the new Mathematics building went on. Also, I took a week in June to participate in an NSF sponsored Principals Conference, organized by Ralph Niemann at Colorado State University in Fort Collins.

On the Berkeley campus, I had an office across the street from Campbell Hall, the math building at that time. I attended courses in Algebraic Topology, a area I had not been exposed to in my graduate study. I also attended seminars in Differential Equations with Professor Steve Diliberto and his students.

Exploring the bookstores along Telegraph Avenue, south of the campus, was a never ending source of pleasure. A distraction was the co-called "Free Speech" movement about which I'll say more in the Chapter *Life with . . .* I also relaxed.

Back in West Lafayette in August of 1965, I was ready to return to my duties at Purdue.

In a letter to Phil Haas written July 29, 1965, from Berkeley, I indicated that in addition to my duties in the Deanery, I wished to be involved with undergraduate concerns. Among other areas, I felt that my observation of the Berkeley administration would be helpful if similar events occurred at Purdue. I felt that the administration there has been less than forthright with the students. I offered such help to some people in the Executive Building. They assured me that they had followed the events in Berkeley and were well prepared. In any case, such happenings appeared unlikely at Purdue which had been characterized in a national news magazine as a "hot bed of rest." In spite of this snub, I served on the Committee on Special Student Problems, created by the University Senate to deal with such eventualities.

I returned to Purdue University as Associate Dean of the School of Science. Dean Haas had sought this promotion for me in March, 1964, but President Hovde and Vice President Paul Chenea thought that, in view of my impending leave, this action should be postponed until I returned. Phil confirmed their expected approval of this promotion in a letter dated March 3, 1964. Apparently he felt, as had Carl Kossack before him, that mere verbal agreements are somewhat tenuous and needed to be backed up in writing. In any case, I returned as Associate Dean – with a reserved



parking space!

At that time the Deanery was located on the third floor of the Engineering Administration Building. The Computing Center occupied most of the first floor. A series of vacuum tube based computers, leading up to the IBM 7090, provided the computing power for the campus. The new Mathematical Sciences Building was under construction. The professional staff of the School of Science consisted of Dean Felix Haas, Associate Dean William R. Fuller, Head Counselor William T. Kiernan and Mr. James Thatcher, Business Manager. The latter was actually a member of VP and Treasurer Lytle Freehafer's staff, but permanently assigned to us.

All departments and schools except the Physics Department had a member of the business office staff assigned to maintain the financial records and protect the university's financial integrity. Somehow Hubert James, head of Physics, had successfully avoided this intrusion.

In 1967 I interviewed for and was offered the deanship in Arts and Science at Colorado State University. Although CSU offered a pleasing locale in which to work, the emoluments were insufficient and I was happy at Purdue so I declined the offer. I speak more about this passed opportunity in the chapter *Life with . . .*

I have remarked that both Phil Haas and I kept a strong attachment to the Division of Mathematical Sciences and especially to the Department of Mathematics. We both taught courses every semester. My focus came to be on the Freshman/Sophomore Engineering and Science calculus courses. In the mid-60s these courses enrolled in excess of 6,000 students.

Unfortunately, these courses were, nationwide, often marked by uneven teaching and high failure rates. In the Spring semester of 1967-68, 41% of freshman students in Calculus received grades of D or F.

Our Engineering colleagues were distressed by these facts. Some of them wanted to take over the teaching of calculus within the Schools of Engineering. From the standpoint of our graduate program, these courses were important; they supported approximately 100 graduate teaching assistants who were working toward advanced degrees in our department.

At this point I proposed, and the department accepted, a policy with regard to calculus instruction which involved the appointment of a Calculus Coordinator, who had the confidence of our engineering colleagues, to chair a Calculus Committee,

involvement of engineering colleagues as members of the committee, engineering professors as classroom teachers of calculus (in practice, these only participated as lecturers), and to improve the fit of freshman courses to the entering class. I was named Coordinator and held the post until 1979, when other demands on my time (the PNC adventure; see *My Life on the Road*) required that I give it up.

The committee was no less a Mathematics department committee than it ever was. It was appointed by the Head of the department from departmental professors and a set of nominees provided by the Dean of Engineering. Engineering professors to lecture were selected the same way and were given temporary appointments in mathematics and paid from its budget. As Coordinator of Calculus, I was involved in making these decisions.

The inclusion of engineering colleagues in the calculus program not only gave them first hand knowledge of it, but also underlined the problems in teaching large masses of students.

A bright student and an excellent teacher is often held as the exemplar of education. One-on-one instruction was not possible. I conceived of a tri-furcated approach based on the idea that there are ill-prepared students who can be remediated, well prepared students who should be allowed to develop, perhaps to becoming mathematicians or scientists, and a large majority of competent students whose main goal was a degree, the admission ticket to the "good life." The first group was to be served by a three-semester sequence covering the material of the standard freshman course, but providing time for review of Algebra and Trigonometry, inadequately covered in high school, and taught in small classes. The second, by an "advanced placement" course, again taught in small classes. The large middle group was to be taught by the lecture-recitation method. This pattern continued for several years.

The three-semester sequence suffered from the fact that no text book existed which integrated material in the correct way, making it incumbent upon the teacher to provide the integration and, largely because of this difficulty, was eventually discontinued.

Advanced placement also provided for students qualified for multivariate calculus and even differential equations.

An interesting aside is that, in 1972, one student successfully established credit for all the courses of the first two years in mathematics. She

was Janice Voss who went on to become an astronaut and make five trips into outer space.

To start with, I conducted a study of grade variations by instructor at Purdue over a five year period and found that the average grade in Freshman/Sophomore calculus, by section, could vary by two letter grades, e.g., from an average of D for one section to an average of B for another in the same semester.

To remove the variability between sections, thorough coordination was provided. Each course had a set of "Ground Rules" which was given to each student, problem assignment sheets were prepared for each course, common examinations were given to all students in a particular course at the same time, grading "keys" and uniform grading procedures were employed. Although the lecturers determined the ranges of scores for each letter grade, guidance, based on the averages of the five year study, were supplied.

Further to assist the students, a program of "common office hours" was established. Under this program, all teaching assistants, in addition to whatever office hours they might provide for their own students, signed up for two hours per week when they would be available to any student in the course. This resulted in approximately 40 hours per week at which times a student could find a teacher teaching his/her particular course.

A *COUNSELORS CALCULUS PACKET* was written to summarize all this for academic counselors. This 99 page booklet included lists of texts, how placement was achieved, sample tests on the various courses and other details to assist counselors, and hence students, in appropriate courses. Feed back was provided to counselors in the case of students who were performing badly for whatever reason.

A Calculus Office was established to provide for collection of data, dissemination of information, exam preparation, etc. Dr. Dennis Sorge was the first, and only to date, manager of this office. Because of his excellent work with the calculus program, this office expanded to the Undergraduate Services Office for the whole department and eventually to a service office for the School of Science.

In 1971 Purdue's Freshman Engineering students rated their mathematics courses higher than any other academic experience.

In 1967 I felt that it was time to be involved more broadly in the affairs of Purdue University and I stood for election to the University Senate. I was elected and served a three year term dur-

ing which time I served on the Educational Policy Committee. As chairman of subcommittees of this committee, I led it to rewrite the Final Examination program and also to change the University calendar.

Up to that time, the traditional calendar across the U.S. involved two academic semesters; the first began late in September and was interrupted by Christmas vacation. This created an awkward period known as the "Lame Duck" session. The students went home for Christmas, then returned for a week of classes and final examinations and then went home again for a two week inter-session. This had long been considered ineffective and wasteful.

The alternatives included an earlier start or a trimester system. Some university colleagues, perhaps tongue in cheek, suggested changes in timing of religious observances which would have solved the problem but were unlikely to be accepted. Included were suggestions to celebrate the birth of Jesus on January 6 (Twelfth Night). Another suggested that the birth probably occurred in the Spring and, hence, Christmas could be combined with Spring Vacation. Our final report contained several such interesting contributions.

Nothing kills a proposed academic action as easily as having it found to have overlooked almost any aspect. I saw to it that my committee was very thorough. We checked with all constituencies: The faculty, naturally, the student government and samples of the student body, the counseling staffs of the various schools, student housing administration, physical plant operations, community leaders and, especially, the public school authorities. Many expressions of resistance to change were encountered.

The operators of the Universities facilities were properly concerned about the effects of August temperature because not many buildings were air-conditioned in 1967. There was concern about having enough water for showers. It was claimed that there was no way of telling what the reserve in the water tank was. I never knew if this was a real problem, but I asked for the drawings for the water tank. Then using Purdue's computer and a simple technique that we teach our freshmen in calculus, I computed the volume of water in the tank as a function of depth. Whether real or not, when I presented the physical plant staff with a table of depths versus volume of water, this concern vanished.

As complete as was our report, the change was not wholeheartedly welcomed by any group

except the students. Many people's traditional summer plans had to be changed, etc. A vote of the entire faculty was called for and conducted. With over 1200 votes cast, the new calendar was accepted by a majority of seven votes. President Hovde forwarded the faculty action to the Board of trustees and the new calendar went into effect.

I served another three-year term in 1973-1976. During this term I was assigned to the Steering Committee which determined the agenda for Senate meetings. I chaired this committee during the 1975-76 academic year. I was elected to a third term in the 1980s and elected Chairman of the Senate for the year 1984-85.



Photo By  
Jane Beering

This was early in Steven C. Beering's presidency of Purdue. Several new trappings had been introduced by the Board of Trustees. One of these was a new design of academic regalia which the President wore at Graduation ceremonies. Another was the introduction of a "Mace" carried by the leader of the academic procession at commencements. This role was played by the Chairman of the Senate. Thus, it was my privilege to be the first to carry the Mace at a West Lafayette Commencement. I carried at about six other exercises around the state as the President and Chair of the Senate participated in all these events. I can't claim to be the first to carry it in general as one campus insisted that their faculty leader do it on that campus.

I lectured to a large class almost every semester. These classes were typically given in EE 129 to groups of up to 450 students. Thus, I estimate that I taught Calculus to at least 20,000 student between 1965 and 1991 when I retired. I soon learned that it is difficult to judge the reception of the material by such a large group. The technique that I thought worked well was to focus on a group of about 30 students immediately in front of me. From observing them I could judge how well my explanations were going over. Of course, they were probably the more *gung ho* students.

Somewhere I have referred to a national news magazine characterizing Purdue as a "hot bed of rest." That is, while students on campuses nationwide were expressing their frustration and anger with government policies, Purdue had remained quiet. In the spring of 1969 a serious shortfall in legislative appropriations for the Purdue bud-

get forced the Trustees to approve a significant fee increase. This caught the students attention. Efforts to explain the need for the increase failed. Returning from spring vacation rallies were organized and a sit-in was held in the Executive Building (*Later named Hovde Hall*). The police were called in. Members of the Committee on Special Student Problems, of which I was a member, went there to moderate the situation if necessary. However, the students dispersed and no arrest were made.

At this time the University was preparing to celebrate its Centennial. I was the School of Science representative on the committee to organize the event. A specific task that I had was to secure the attendance of Representative Earl Landgrebe to present a congressional resolution of congratulations.

Just before the *Founder's Day* program a group of student occupied the Purdue Memorial Union. Considerable damage was done and some friends and alumni who had reveled in Purdue's calmness, threatened to withdraw their support. Representative Landgrebe called me the day before he was to appear concerned about the volatility of the situation. I thought things were pretty calm compared to Berkeley, so I told him there was nothing to fear.

That night over 200 students were arrested for "trespassing." Founders Day, May 6, 1969 (See Bob Topping's *The Hovde Years for details*), was then marked by a large group of students entering the Hall of Music, where the official celebration was to be held; standing with a raised clenched fist as the President began his introductions and walked out of the Hall. Landgrebe suffered no ill-effects from these confrontational episodes. Because of the legal controversy surround the arrest for trespassing, The Union was officially closed at night after that.

I don't recall Vietnam being specifically a part of this unrest, but it was a major factor in the general malaise on campuses and in the whole country.

The course I usually taught was the freshman calculus course, taught to about 450 students, usually in EE 129, a lecture hall built to accommodate 480 students. In the course of one lecture period in 1967 or 1968 I had worked out the solution to a complicated exercise which required 5 or 10 minutes of overhead projector work. At the conclusion a student remarked on this length of time and asked me if I didn't "know that a computer could have solved it in 30 seconds?" There

was widespread applause for this question. While I was not at all current on the developments in computing, my past experience told me that it probably wouldn't have taken a computer even 30 seconds to solve the problem, but that it might have taken several hours to get it ready for the computer.

I felt that the students should experience both aspects of this issue – the speed of the computer in producing numbers, as well as the processes associated with programming the solution. The Committee on the Undergraduate Program in Mathematics (CUPM) of the American Mathematical Association had, in the post-Sputnik years, proposed that mathematics should be taught “with an awareness of computers,” whatever that might mean. The National Science Foundation was sponsoring a program along those lines through the Center for Research in College Instruction of Science and Mathematics (CRICISAM) at Florida State University. I decided to explore this approach and also was accepted to their program. In the Fall of 1969, I began a series of approaches to the use of computers in calculus instruction.

My failure to be intrigued by Carl Kossack's offer to show me the new programming techniques ten years earlier now came back to haunt me. I was amazed at how far computing had progressed when I began to examine FORTRAN for use in my course. I studied FORTRAN while sitting at Lou's bedside in a Denver hospital. I describe this ordeal in the Chapter *Life with . . .* I was essentially in the position of the teacher who said to his students: “I'm on page nine; catch me if you can.”

I also found that most books on FORTRAN were not well organized for use in calculus courses. One could simply not wait for mastery in programming to start applying it in calculus. I wrote my own notes and asked the computing center to provide a special subroutine to provide easy output before the students had time to learn about formatting. The Computing Center prepared a special sub-routine named OUT. This allowed to students to obtain the results of computations by simply writing CALL OUT in their FORTRAN programs.

Springer Verlag published my book “FORTRAN, A Supplement for Calculus Courses” in 1977. I applied the computer to all the courses up through differential equations and matrices. Over the years several other colleagues were involved in teaching computer oriented courses using my book.

I gave reports on these efforts at a CUPM

panel on computing at a conference in Atlanta, an AAAS meeting in Chicago and an MAA meeting in Missoula, Montana. I was also invited to present it at an in-service teachers institute in Colorado Springs, Colorado,

Unfortunately, I had caught the “back side” of the wave. My book was based on punched cards and FORTRAN. The wave of the future, which was forming up at that moment was programming and data entry via terminals rather than punched cards. Other high level languages were also being put forth by computer science departments and programs to handle many mathematical problems were being developed.

A question that pervaded many early attempts to use the computer in mathematics courses turned on whether programming would be a teaching device or whether the computer would become a “giant” slide rule. My concept was that by “teaching” the computer to solve a problem, the students would better understand the mathematics involved. Eventually, the “giant” slide rule approach prevailed.

I think I received about \$1,000 in royalties from my book. Obviously, it was not a best seller!

For me, at least, it was very interesting. I continue to program in BASIC and FORTRAN and, more recently, HTML, the language of the World Wide Web. Some of my students from those early days have made careers in computing. One is on the staff of Information Technology at Purdue (ITaP) which succeeded the Computing Center. Another is a distinguished professor at the University of Maryland and one is the Apple representative to the schools in midwest.

Another problem that I noticed was what might be called a “lock step” approach to teaching. A student starts a course on a specific date and ends on another, passing through a collection of mathematical topics enroute. I felt that there were students who might profit from the opportunity to proceed at their own pace, in an independent study environment. Accordingly, in the Fall of 1974, Professor Jean E. Rubin and I started an independent study approach to MA 262, the first course in Differential Equations. In 1975 the course in multi-variate calculus was added to the program.

We were assigned a room in the physics building which was dedicated to our courses. We supplied the room with auxiliary study materials, course outlines, and exams to be taken as certain bench marks were completed. Several exams covering each block of material allowed students to

take exams as they individually progressed to the point. Many students liked this approach. However, counselors were wary of it as they did not know how their advisees were progressing. Students were required to register for these courses as for any course; if a student did not complete the course within the semester, an Incomplete was given. Many faculty members, especially in Engineering, did not like the idea of these incompletes and the lack of classroom discipline. Professor Bouendi, the Head of the Mathematics Department at that time thought the approach required more man-power than conventional classrooms. After several years, we gave up and abandoned the idea.

While involved with these activities, I continued as Associate Dean of the School of Science. In 1974, Phil Haas accepted the role of Provost and Vice President and I was asked to serve as Acting Dean of the School of Science. This was another busy year, as searches were underway for new Heads for both Biological Sciences and Mathematics. As Acting Dean I kept very close contact with Provost Haas, but much of the negotiating, entertaining, etc., fell to me (and of course, to Lou). It was traditional for the Dean to chair the search committee. As such I met regularly with search committees from both departments, helping them obtain references and other data needed to help them make their final decisions. Leonard Berkovitz, was chosen Head of Math, and Struther Arnott Head of Biological Sciences. Concurrently, a committee chaired by Provost Haas chose Allan Clark, a mathematician from Brown University to be the new Dean of Science.

In 1974 Meyer Jerison, Head of the Mathematics Department, unsuccessfully recommended me for the AMOCO Outstanding Undergraduate Teaching Award. The following year Professor Rubin, Chairman of the Undergraduate Majors Committee, and Professor Robert A. Gambill, Acting Head of the Department of Mathematics, submitted a similar recommendation. This was successful and I received this award at a faculty convocation in April, 1976. (See Page 257) Both proposals contained supporting statements from Beverly Stone, Dean of Students, Clifford S. Gerde, Assistant Dean of Engineering and Director of Freshman Engineering, and Professor Floyd Nordland, School of Science Counseling Staff.

An award of \$1,000 and a certificate accompanied the award. A more lasting recognition came in 1999. At that time President Steven C. Bering created the Academy Park. "The Park was

named for the public garden established by Plato in 387 B.C.E. where he and other Greek philosophers imparted their wisdom. The Park honors faculty who, throughout Purdue's history, have contributed much to the lives of their students through excellence in teaching and scholarship." At the same time a bronze plaque was installed in the Purdue Memorial Union called Purdue's Book of Great Teachers. At that time departments nominated all past faculty members who merited inclusion on this plaque. Winners of past teaching awards such as the AMOCO Award were automatically included.

The first group of inductees included six from the Mathematics Department among 267 persons representing the first 130 years of Purdue history. The six included only one deceased person, G.N. Wollan. History may have overlooked some great teachers of the remote past.



*R.E. Zink, M. Golomb, J.J. Price, J. Brown and me*

In 1975-76 I continued my usual activities as Associate Dean of Science and Professor of Mathematics, the former under newly appointed Dean Clark.

I was not too happy with the choice of Clark for the deanship. I felt that his background did not equip him to appreciate the "Land Grant" tradition. However, I wasn't unhappy enough to leave

even though I had inquiries about becoming Vice President for Academic Affairs at the State University College of Buffalo and Virginia Polytechnic Institute and State University at Blacksburg. Of course, impending hip replacement surgery was one of the main reason for not following up on these opportunities.

The presentation of the Amoco Undergraduate Teaching Award at a Faculty Convocation in April, 1976 was a bright spot for me. (See Page 257)

In May, 1976, I went on extended “sick” leave in order to have total prostheses installed in both hips. My arthritic problems derived both from my accident in 1937 and a genetic propensity. See *Life with . . .* for more details.

After a year in office, Dean Clark indicated that he would like to have an Associate Dean of his own choosing. It was not hard for me to offer my resignation and to return, full time, to my Professorship in Mathematics. I was succeeded by James Yackel, who later became Chancellor of Purdue’s campus in Michigan City.

The serenity of my professorial life was again interrupted in the Spring of 1978 by a new call to service of Purdue. A delegation of faculty members from the Purdue campus south of Michigan City, Purdue North Central (PNC), visited President Arthur G. Hansen and presented him with a list of complaints about their Chancellor John W. Tucker.

I am unaware of what options were available to Hansen and Haas, but shortly following the visit of this group, Phil asked me if I would be interested in moving to PNC. I didn’t find this appealing. I liked West Lafayette and was involved in the community. I was asked if, as a “personal favor” to the President, I would be willing to spend a year there as Vice Chancellor for Academic Affairs while sorting out the problems and offering recommendations. The actual rationale was something like: “You used to be a rebel, perhaps you can understand these people.” I imagine they thought that I would be captivated by the place and decide to stay. I did agree to this year of investigation. It extended to four years before it was over. The story of these next four years, 1978-1982, is in the chapter *My Life on the Road*.

I returned to full time status in the department in the Fall of 1982. I was still teaching my computer oriented calculus course and lecturing to science and engineering students in calculus courses. But, as a former administrator, I was not allowed to relax for long. In 1980, Eltherio (Terry)

Zachmanaglou, Assistant Head of the Mathematics Department, asked me if would take on the supervision of graduate teaching assistants (TAs). In this capacity, I organized screening programs for new TAs to verify both their language and mathematical competencies, worked out their teaching schedules, handled student complaints about teaching problems, etc.

As Coordinator of Calculus at a major Engineering school, I was frequently called on by representatives of publishers. One of my peripheral activities became refereeing books proposed for publication. Most of these were Calculus books, but there were also books on Elementary Differential Equations, and Linear Algebra. When I recently discarded my file of these reviews, I found that I had read and commented on more than 75 books between 1968 and 1988. I still did one or two more up to 1993. Some of these became successful texts. I may have helped keep some really bad ones out of print. Sometimes a really good teacher would think it possible to translate his/her style into a text. This was almost always a bad idea. This was a period when the public was becoming more conscious of gender roles. I was able to advise against exercises with males plowing, and females grocery shopping, etc. My favorite was: “Mrs. A invites Mrs. B to morning coffee.” It was also a time when the use of metric units was on the rise. Simply changing the name of the units produced surprising results. Changing “cubic feet per minute” to “cubic meters per minute” can be dramatic. I remember urging that a baby be gotten out the tub as soon as possible.

I also refereed a few articles with mathematical or pedagogical content for American Society for Engineering Education (ASSE) journals.



Glee Club Dinner – Upstairs at Bruno’s – ca 1985

Around the outside: Felix Haas, Ron Fruitt, Jack Stockton, Bill Fuller, xxx, Bill Fischang, Student, Bill Allen, Student, xxx, Fred Ford, Maury Williamson, Al Stewart, xxx, Dick Kohls.

On August 16, 1982, William E. Luhman, Di-

rector of the Purdue Glee Club announced that I had accepted the role of Glee Club Sire. The Sires were a collection of senior faculty and administrators who served as sponsors for the Sires. The latter were the chairs of various committees attending to the details of Club activities. I was the sponsor of the Scholarship Committee. The Sire/Sir concept originated with Albert P. Stewart, founder and longtime director of the Glee Club.

I enjoyed this activity for many years, becoming inactive when I was made Sire *emeritus* in 1991. One of the ways I helped the men of the Glee Club was by interceding with faculty members to provide alternate exam times when a scheduled evening exam coincided with a performance. This was not an inconsiderable task as the group performed somewhere at least weekly. On one occasion, I presented a slide show of some the attractions they would visit on a performing tour of England.

I also entered into two new off-campus activities during this period. In 1984, Professors Harold Michaels and D. Richard Smith approached me about becoming a Rotarian. In 1986, Lou and I decided that we would like to make a trip to South America where we understood Halley's comet could be seen better. This led to an association with the Partners of the Americas. I'll tell more about these activities elsewhere.

I continued thus until June 30, 1991, at which time I retired. Retiring with me were Phil Haas and Meyer Jerison. Growing up in the 1930s along White River north of Indianapolis, I never dreamed of retiring in such company, nor could I have conceived of the professional and personal life I have tried to describe. I cannot give enough credit to my wife Lou for her love, comfort, understanding and endurance as these events unfolded.

## My Life on the Road

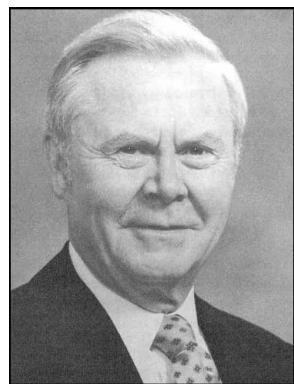
Brookston, Chalmers, Smithson, Reynolds, Monon, Francesville, San Pierre, La Crosse, Wanatah, and Westville are the villages along Indiana 43 and US 241 that one drives through between Lafayette and Purdue University North Central (PNC), a campus just south of Michigan City, Indiana. A few more place names appear on the map, but since one isn't aware of any actual settlement, I didn't list them. In the Fall of 1978 I began to become very familiar with these places.

In May, 1978, President Arthur Hansen was visited by a delegation from PNC seeking some kind of relief from certain actions of their Chancellor, John Tucker. In addition to certain perceived administrative shortcomings, there were specific complaints about discrepancies between "promised" and "actual" salaries of several persons.

Shortly thereafter Phil Haas, now University Provost, called to ask me if I would be interested in becoming the Chancellor of PNC. I enlarge here on the report of this period that I referred to in the Chapter *From here to . . .*

As I reported in *Life with Lou, . . .*, I had left the Dean's office in 1976. I had served as Assistant Dean in 1963-64; Associate Dean in 1965-1976; and Acting Dean in 1974-1975. These activities followed the tempestuous years 1959-1962. Now for the first time in my academic career I had only professorial duties; primarily teaching plus a few committee assignments. I was enjoying life and had no particular interest in northern Indiana. Frankly, I didn't regard this request as the offer of a "plum."

My reluctance to give up the "cushy" life of a professor was met with the claim that taking on this job would be a "Personal favor to President Hansen" and, I suppose, to the Provost, my old friend, Phil Haas. Words like "You used to be a rebel, maybe you can understand what they want." were used as further persuasion. I agreed to go up there for a year as Vice Chancellor for Academic Affairs to



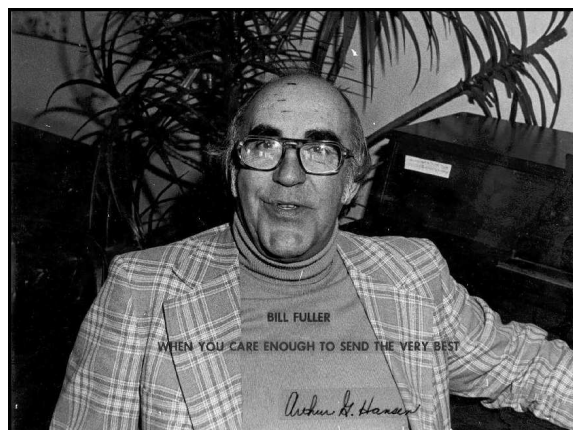
Arthur G. Hansen

sort out the issues and make recommendations to President Hansen.

I'm not sure of the dates, but my Calendar

for May, 1978, shows a meeting with Haas at 3:30 PM on Wednesday, May 10, and at 11 AM on the 11th the notation: "Leave for Westville" followed by "Meet with Bednar, NCC" and possibly John Tucker that afternoon.

The faculty assembled that afternoon were a grim lot. In retrospect, I suspect that they were reacting to years of neglect and uncertainty about what this meeting was going to bring. What could be done to help them? At that first meeting, Phil assured the assembled faculty of the University's interest in the well being of the North Central Campus. He told them that I had agreed to come there as Acting Vice Chancellor for Academic Affairs, to sort out the issues and make recommendations to President Hansen. Indeed, he stated that in sending Professor Bill Fuller there they were "sending their very best." Since those words were the slogan of the Hallmark Greeting Card Company, I was known forever after as the Hallmark Chancellor.



Arthur Hansen's signature pasted on a photo of me

When it was my turn to speak I acknowledged that I was indeed Professor Fuller, but that in my home department I was just called SOB. I continued that I assumed this stood for Sweet Ol' Bill. This broke the ice and the tension. SOB became my sobriquet for life.

The first up-side of my agreeing to work on the PNC situation was an expanded opportunity for flying. During my first year at PNC I flew a Staff Aero Club plane up there and landed on a strip across U.S. 421 from the campus. This little private strip was maintained by an orthodontic laboratory, for use by dentists flying in to learn about new appliances. It had only one east-west grass runway.

I usually flew up there on Tuesday, Thursday and Friday, teaching a class at West Lafayette on Monday, Wednesday and Saturday. I describe



this more fully in the Chapter *My Life in the Air*. When this proved too time consuming, I drove my own car.

Vice Chancellor for Administration Bill Back convinced his boss Treasurer Fred Ford to let me keep and drive a University car. I was assigned a little brown Chevette. Fred gave strict instructions that I was to drive it nowhere except to PNC and back and for necessary business while at PNC. After I started driving, I usually spent Thursday night at the Michigan City Holiday Inn.

A little background about Purdue's Regional Campus system may be useful before proceeding with this account.

To assist in meeting the educational demands of the men and women returning to civilian life after World War II, universities opened regional campuses in various parts of their service area. In the Purdue system, these grew in a more or less uncontrolled manner until President Frederick L. Hovde appointed Professor Charles (Chuck) Lawsche, a professor of Clinical Psychology, to head up the operation in 1958. Many details of "Chuck's" operation are to be found in the books by Bob Topping *The Hovde Years* and *A Century and Beyond*. One of the features of the operation was the appointment of a representative from each department on the West Lafayette campus to oversee the way that department's courses and programs were conducted in centers around the state.

PNC commenced operations in the late 1940s as an Extension Center in LaPorte, Indiana. In 1948 the Barker family, he a local industrialist, offered the family home, the Barker Center in Michigan City, to the university as a permanent home for the center. In 1967 the operation was moved to 155 acres of farmland along U.S. Highway 421 south of Michigan City. Accordingly, it was often referred to as the "Campus in a cornfield." At that time, the campus took on the name Purdue University North Central (PNC).

My personal knowledge of this operation first came from my association with a colleague – M. Wiles Keller, the mathematics representative on Lawsche's team. About half of Wiles' time was assigned to this function and assured that the quality of teaching appointment, instruction and course content was appropriate. He oversaw the mathematics operations at all regional centers: Indianapolis, Fort Wayne, Gary and Michigan city.

The campuses at Indianapolis, Fort Wayne and Gary, being in metropolitan areas grew to be larger and to have more diverse offerings than

many colleges. The local faculties and the local citizens chafed under the West Lafayette control and one by one these campuses were granted autonomy by the Board of Trustees. This meant that within the Board mandate of transferability of course credit, these larger operations were freed of West Lafayette supervision and control.

PNC, the smallest regional campus, did not have as broad a base of community support nor anything like as many students. Its authorization under the Indiana Commission for Higher Education (ICHE) included mainly Freshman and Sophomore courses. No baccalaureate degrees were authorized for the campus.

The end of the central supervision of the Regional Campuses left PNC to find its own avenues of survival in its efforts to serve the needs of the Porter/LaPorte county area.

In addition to addressing the issues presented by the faculty delegation, I found a plethora of "arrangements" under which permission had been granted to PNC faculty members by individual West Lafayette departments for offering courses beyond the level of ICHE authorization. Under these arrangements area students could complete baccalaureate programs at PNC and receive their diplomas at a local commencement. The diplomas stated "Awarded at West Lafayette." These arrangements were the result of trying to satisfy the educational needs of a "Region Bound" population. In fact, "Region Bound" was virtually the slogan for the campaign that was mounted during my tenure to meet these area needs.

All the regional campuses did, and still do, deal with a student population which is significantly older than for the typical college. Many of those seeking degrees could not move to a residential campus. Among the binding factors was, of course, their jobs. They often needed advanced course work to progress at their places of employment. It was to meet these needs that arrangements described above were made.

Still another issue that I had to address was that of "credit for life experience." Many of the older local students had considerable professional experience. It had been judged that these individuals should qualify for "unassigned" college credit for these work experiences. Unfortunately, when carried to extreme, this can become a "degree give away." Some really egregious cases came to my attention which resulted in the removal from office of at least one "experience" evaluator. I found it ironic when Art Hansen asked me "What kind of diploma mill are you running there?" My retort

was to remind him pointedly of my reason for being there.

As the academic year 1978-79 wore on, it became clear to me that the progress of Purdue North Central depended, as a first step, on replacing Chancellor Tucker. When I reported this to President Hansen and Provost Haas, they said that they would agree if I would stay on as Chancellor. I still didn't want to do that; a compromise was reached under which I would stay for some number of years until the viability of the Purdue presence in that area was proved. Starting with the 1979-80 academic year I became Interim Chancellor of Purdue, North Central. I'm not sure what "Interim" implies that "Acting" does not, but Dean of Agriculture, Dick Kohls, was delighted that I had the former title rather than the latter.

This was when I asked Bob Schwartz to return to administration as Acting Vice Chancellor for Academic Affairs. He graciously agreed to do so and served two years in this position at this time.

Another issue was the attitude of the West Lafayette administration. From the accounts that President Hansen was receiving about the operation at Westville, he had serious doubts about the long range viability of the campus. At a meeting of the faculty on March 27, 1979, he expressed these concerns and directed me, as Chancellor, to appoint a committee or committees to study and report on:

- Enrollment projections for the Campus,
- The role of adult education on the Campus,
- The educational needs of the region served by the Campus and
- An organizational structure for the Campus.

The first three of these issues were related to concerns that the population of college aged students was falling nation-wide and that the northern tier of Indiana counties had not experienced the growth to a megalopolis that had once been predicted. The last was the part and parcel of the dissatisfaction on the part of the faculty.

The future existence of PNC may well have depended upon the responses to these issues. Dale Alspaugh, my successor at PNC, expressed this generally held view in a letter he wrote to Lou and me on the occasion of our 50th wedding anniversary:

"I think it is entirely possible that without your intervention, the North Central Campus might well not exist today."

As a result of my first year there, I felt that the existence of the campus, and its enlargement,

was vital to the area. To address these issues, after consulting with Bob Schwarz and Bill Back, I established a task force consisting of, in addition to them, Mrs. Jo Ellen Burnham, director of campus and alumni relations; Mr. David P. Konzelman, admissions officer; English Professor Roger C. Schlobin; and Mathematics Professor L. Edward Bednar.

For professional expertise I contacted Professor Jack Jacoby, who, together with one of his classes, had helped me *pro bono* in surveying community attitudes toward the Lafayette Symphony Orchestra. (See: *Other Adventures*) Because of the remoteness from West Lafayette and the time urgency, he was unable to assist us, but referred us to Mrs. Shay Kohne who operated *Student Recruitment Services* in West Lafayette, Indiana.

To formulate, collect, analyze and present the data necessary for these responses, a contract was negotiated with this organization. Shay became a regular visitor to the campus, driving her oversized brown Checker automobile, overseeing many details of the study needed to answer President Hansen's concerns. Under her direction, we prepared, distributed and analyzed data from our two principal counties, Porter and LaPorte, our current students, and high school seniors in these two counties.

The data and conclusions are presented in full in the report *Viability to Vitality*. In brief they were:

- Significant growth in the area was expected,
- Adults are a significant portion of the student population and are **region bound**,
- The campus had a positive image for prospective students and should develop bachelor degree programs in Supervision, Liberal Arts, Nursing and Elementary Teacher Training.

While these studies were going on, the issue of organizational structure was being dealt with as well. Because PNC was a small operation, many Purdue, WL, departments were represented at PNC by a single professor. This isolation resulted in a lack of collegiality among the faculty and the burden on the Vice Chancellor for Academic Affairs of dealing with some as individuals and with others through Section heads. Only about half of the faculty were represented by section heads in 1979 when I became Interim Chancellor.

According to Purdue University Executive Memorandum A-221, academic units composed of five or more members could have section heads. Since it was unlikely that the campus would soon

grow enough to put all disciplines in this category, I proposed the creation of units made up of individuals from kindred disciplines. In a few cases it would be necessary to add individuals to existing sections. To bring this off it was necessary not only to convince the local faculty, but the associated West Lafayette department heads. I did manage to pull this off.

The sections thus created were:

- Social Science and Education (Psychology, Philosophy, History, Education);
- Letters and Languages (English and Foreign Languages);
- Biology and Chemistry;
- Mathematics and Physics (Physics added to the existing Mathematics section);
- Technology and Engineering;
- Nursing (already a section); and
- Community College (business, secretarial arts, etc.).

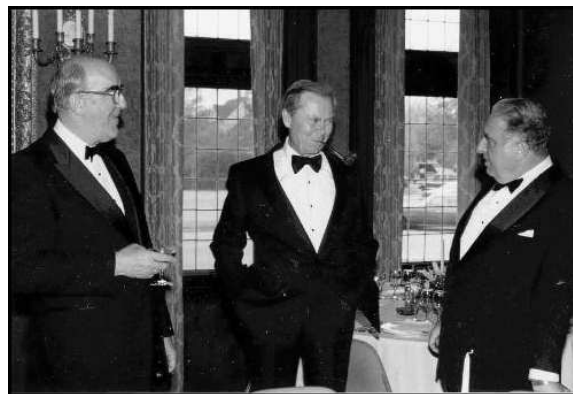
Two additional and important activities began in 1979, the first year of my Chancellorship. They were the creation of an Advisory Board and a Chancellor's Council. The former was composed of 29 community leaders including, mayors, newspaper publishers, executives from area businesses and industries and social leaders. It had the purpose of marshaling community support for the push to bring more degree opportunities to the area via PNC. The second was a fundraising operation. Bill Back's and Bob Schwarz's knowledge of the community was instrumental in assembling a group which could speak forcefully for the community and its needs.

Regular meetings, often over lunch on campus, were held with the Advisory Board. This provided an expansion of knowledge among these leaders about Purdue University and the North Central Campus in particular. Much fruitful discussion took place at these meetings and from them came community support, in the form of petitions, for proposed new programs.

The fund-raising Chancellor's Council was composed of both faculty members and town persons and, as such, provided an ideal interaction between these groups which had previously been mostly unaware of the existence of the other.

Several activities for the Council were also arranged. A gala dinner was held annually at the Barker Center, an elegant older mansion which had been the early home for PNC. This was normally a "Black Tie" affair with multiple dinner courses, appropriate wines, etc. These were elegantly organized by JoEllen Burnham. I com-

plained to Bill Back that we were spending too much money on these events. He felt they were worth it for good will. I suppose he was right as they were very successful and brought about yearly growth in the Council's membership. Many of these individuals became long term friends and supporters of PNC.



*Me, Arthur Hansen, Felix Haas  
At the Barker Center*

In addition to these dinners there was also one bus trip a year to Lafayette for a football game. I asked Executive Assistant Vice President, John Hicks, who had always been helpful to me, to arrange for us to have a block of tickets for these games. After the game a catered "tailgate party" along side the bus was enjoyed by all. I think there were three of these trips during my tenure. After one of these games, Shay Kohne invited the group to her home for a party. This marvelous experience was somewhat marred by the bus driver inadvertently removing a significant portion of a neighbor's hedge due to the busses turning radius!

I also thought it important to obtain a non-golf membership in the Potawatamie Country Club for contacts with the town. Since the university could not pay for such memberships, I had to pay for everything that wasn't strictly university business out of my own pocket. I also was required to spend a certain amount each month in the dining room. To meet these expenses, my local colleagues went with me there frequently, repaying me for their meals so that I could meet the use requirement.

Armed with the data of *Viability to Vitality*, a proposal to ICHE was prepared and approved by Purdue's Board of Trustees. This regularized the bachelor's degree in Supervision which had been operating under the aegis described earlier. This program was much in demand, especially in the western portions of PNC's service area and was approved by ICHE in 1980.

My first visit to the ICHE office in Indianapo-

lis was one of those quasi-comic affairs that sticks in the mind. After reviewing at some length, the PNC situation, the needs of the area, the inability of the population to seek needed courses elsewhere, etc., in short, the need for the Bachelor's degree in Supervision, the functionary with whom I was speaking pulled out a large tome, turned to the appropriate section and declared: "PNC is not authorized to offer bachelor's degrees." I informed him that I knew that, but was there to propose a needed change in the authorizations.

Years later I was reminded of this scene, by the M\*A\*S\*H episode in which the unit was told they weren't authorized to have an incubator, but could have a popcorn machine. Fortunately, PNC already had a popcorn machine.

The Bachelor's degree in Supervision was approved by ICHE in May 1980, and was first offered at PNC that Fall. With this precedent setting action, I began to be more confident that other degrees would be approved.

The next degree to be sought was to be called the B.S. in Liberal Studies. Technically this degree first needed approval by the School of Humanities, Social Science and Education (HSSE) on the main campus because, as an Extension Center without autonomy, PNC could only offer programs approved for the West Lafayette Campus.

What might have been a road block to this effort was a study released by ICHE in January, 1981. In the interest of avoiding duplication of effort, ICHE proposed to merge the Purdue and Indiana University campuses in the Northern area of Indiana. The resulting campus would have been in the Gary area and would have required a commute of up to 50 miles for some of our students. Because of the region bound nature of many of the more mature students, I felt this move would be unwise. My criticism of this proposal was carried in several local newspapers.

All existing programs in Liberal Arts involved a major in one field of study in this area. It was not anticipated that, in the short run, there would be enough students interested in any one field such as Literature or Philosophy, etc., to offer majors in those areas. Therefore, I appointed a committee of PNC faculty members to work with their counterparts in West Lafayette to design a general program. The idea was to provide students with a wide latitude in the choice of courses from humanistic studies to enable them to move forward at their places of employment. The program was aimed at the more mature student, typically with a family and, especially, region bound.

Approval of the BLS degree from the faculty of HSSE and Purdue's Board of Trustees came early in 1981 with ICHE approval in September of that year.

Bob Schwarz did not really want to be burdened with the job of Vice Chancellor for Academic Affairs. He had given great service to Purdue and to the North Central Campus starting with its location in the Barker Center in Michigan City. After the current site was acquired and the campus moved there, Bob had then returned to teaching. Now he wanted to be relieved of the recall duty I had imposed on him.

Accordingly, I began to think of a more permanent replacement. My goal was to bring along a new Vice Chancellor who could also become the next Chancellor, since I still considered my work at PNC to be temporary.

Dale W. Alspaugh became that person. Dale



was an Associate Professor of Electrical Engineering on the West Lafayette campus. I don't recall what brought him to mind in this capacity beyond a chance meeting in a parking lot near the Mathematical Sciences Building in West Lafayette.

I presume I talked with Provost Felix Haas about this possibility. I then contacted Professor Henry Yang who was head of the School of Electrical Engineering to obtain his permission to approach Dale.

The details were completed and Dale assumed the position of Vice Chancellor for Academic Affairs in the fall of 1981.

When I appointed Dale Alspaugh to the position of Vice Chancellor for Academic Affairs, I made the blunder of announcing to the faculty that I was bringing them a Vice Chancellor who could become Chancellor when I left. You should never tell a faculty group that you have made a decision for them. Of course, I was only talking about Dale's qualifications, but, to them, it sounded like a *fait accompli*.

This ultimately delayed Dale's ascension to the Chancellorship for two years. Especially in the position as their link to the main campus, they did want someone appointed without their blessing. Provost Haas determined that the search for a new Chancellor should be made from within the Purdue system. Alspaugh was appointed Acting Chancellor effective July 1, 1982 and the "acting" was dropped in 1984.

The people at PNC that I was most involved

with were: Ed Bednar, Bob Schwartz and Bill Back.



L. Edward Bednar, Professor of Mathematics at PNC. I had known Ed for several years through my work as coordinator of the Calculus Program. If I was going to have something to do with PNC I considered him my best source of information about the situation there. I knew him to be a level headed professional person, not given to extremes of judgement.



Robert F. (Bob) Schwartz was known as Mr. North Central Campus. He was instrumental in establishing the permanent location of the campus on U.S. Highway 421 south of Michigan City. After my year as Acting Vice Chancellor for Academic Affairs I asked him to help by taking on the role I was vacating to become Interim Chancellor.



G. William (Bill) Back was the Vice Chancellor for Administration. As such he was the Purdue's Treasurer's representative at PNC. He was responsible for the physical operation of the campus. He supervised maintenance, police, etc. He was a very knowledgeable person about important people in the PNC service area.

I also had two great assistants during those years. Diane Carpenter, while Vice Chancellor for Academic Affairs and Debra Nielsen, while Chancellor.

By 1982 the anomalies of degree offerings had been dealt with, two degrees had been authorized by ICHE, an organizational structure had been put in place for the academic operations, community support had been solidified and an outstanding replacement for me was on hand. I felt that I had accomplished the initial phase of *Viability to Vitality*. Although the PNC experience had been rewarding in very many ways and left me with many new friends, I felt that my home was in West Lafayette. So I asked President Hansen to allow me to return to full-time activity on the West Lafayette campus. He did.

My "Pilot's Log" records 90 some flying hours during my first year at PNC. In the ensuing three years I probably drove more than 50,000 miles.

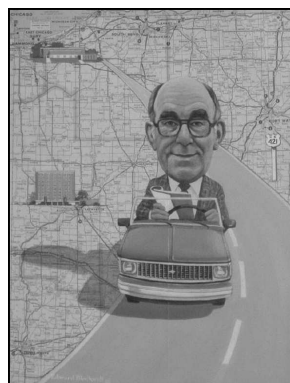
The contributions of these colleagues and others with whom I worked are not easily distinguishable in my mind twenty years after completing my work there. They all were part of the team and I regret not being able to single them out in recounting our accomplishments. They were largely responsible for charting a future course for the campus which won the approval of the Trustees and the Indiana Commission on Higher Education.

The campus held a "going away party" for Lou and me when my work there was completed. The affection I felt at this party was as nice an experience as I have ever had. In addition to the well wishes of many faculty and students, I received a "*Sagamore of the Wabash*" from Governor Robert Orr. This is Indiana's highest honor. The certificate was presented by Representative Mary K. Budak. (See Page 258)

Other gifts included a chef's hat and apron. The former bore the letters S.O.B. The latter was appliquéed with the words "A Hamburger on a Pun." The S.O.B. was in recollection of my quip at the first meeting with the faculty (see earlier in this Chapter.) The pun reference recalls a propensity for this kind of humor. I wish I could recall some of my puns.

I think the inspiration for this outdoor chef's outfit sprang from an occasion when I brought many of the PNC secretaries to West Lafayette to meet the counterparts they talked to regularly by telephone. After visits to the West Lafayette campus we had a cook-out at our house on Carrolton Boulevard.

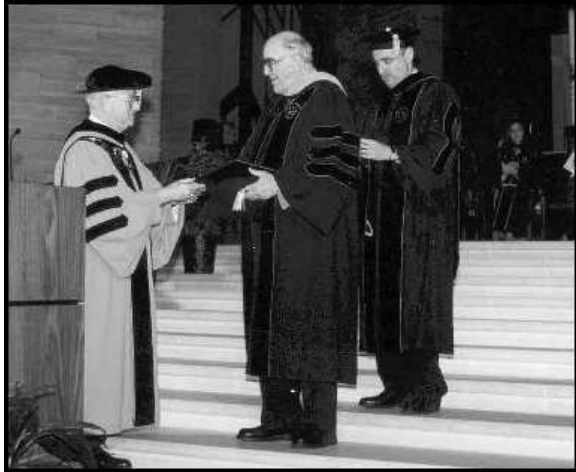
Another treasured gift was a painting executed on a map of the State of Indiana. It showed me driving the little brown Chevetté up U.S. 421 reading a report while I drove. Because of the light traffic on the road I was actually able to do some reading enroute. I also dictated my thoughts on these items enroute. The painting was done by Edward Blackwell of the Audio-Visual Aids



Department.

In 2000, PNC recommended to the Board of Trustees that I be awarded the degree Doctor of Science, *honoris causa*. This degree was presented by President Steven C. Beering at the May, 2000, PNC Commencement exercises in the Valparaiso

University Chapel. Lou and Jim were able to be in attendance at the ceremony. (See Page 253)



*President Steven C. Bering, left  
Chancellor James Dworkin, right*