

PURDUE ENGINEERING

Legends & Lore

Thirty-two tales of the intrepid students, eccentric professors, and explosive labs that have contributed to life and learning within the Schools of Engineering.



PURDUE UNIVERSITY



October 1995

Dear engineering alum:

When Purdue's Heavilon Hall burned in 1894—and with it, one of the world's best engineering labs—the vow to raise a new building “one brick higher” reflected a can-do spirit that remains a tradition in our Schools of Engineering. That vow also became the key line in one of the best-loved stories about Purdue engineering.

In this booklet, *The Legends and Lore of Purdue Engineering*, alumni, faculty members, and students tell *their* favorite (and more recent) stories about their experiences at Purdue. Taken together, these tales of legendary professors and intrepid students convey a rich tradition of life and learning within the Schools of Engineering. We hope you enjoy the collection.

And although numbers can't tell the complete story, I would like to share some figures with you concerning the Schools of Engineering in 1994-95:

- **1,811** more students received degrees and became alums
- **1,793** energetic individuals enrolled in the Schools of Engineering and began the exciting task of becoming engineers
- **\$3,760,070** in scholarships and fellowships was awarded to engineering students
- **\$1,373,027** was spent to equip new and upgraded instructional laboratories
- **237** new PCs replaced or expanded equipment in our computing labs
- **207** new workstations replaced or expanded equipment in those labs
- **11** new courses were added to meet the changing needs of students
- **19** new faculty members were hired
- **\$10.1 million** was given to engineering by individuals, corporations, and foundations:
 - \$3,458,198 from our alumni and friends
 - \$598,437 in matching gifts from alumni employers
 - \$6,093,015 in cash and equipment from our corporate partners and foundations

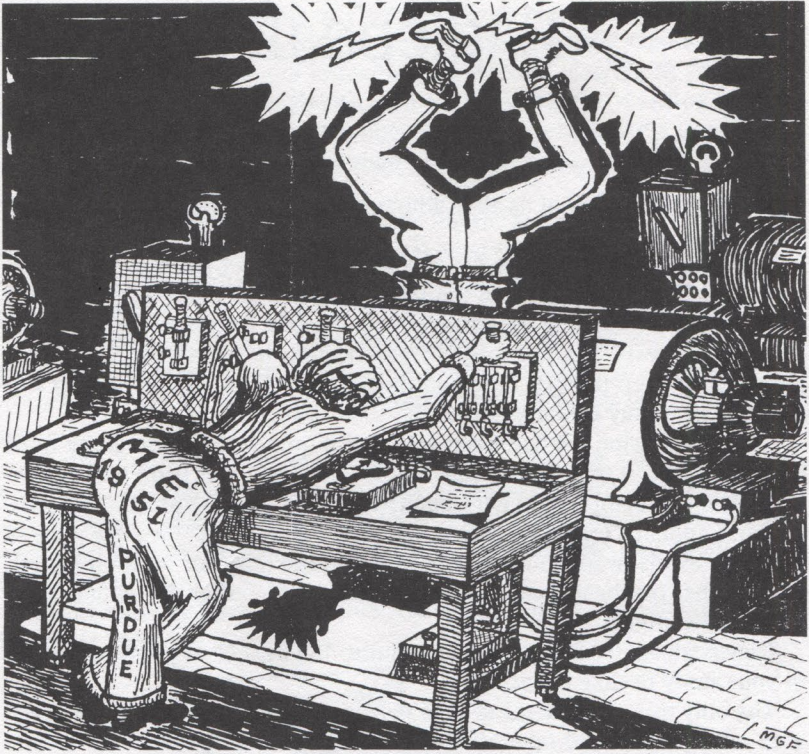
The success stories that those numbers reflect resulted, in large part, from the generous financial support and can-do attitude of our alumni and friends. As I begin my work in the 1995-96 fiscal year as Purdue's dean of engineering, I ask you to help further our Purdue tradition of excellence by making a gift this year to the Schools of Engineering. I appreciate your support.

Sincerely,

Richard J. Schwartz
Dean

OFFICE OF THE DEAN

1280 ENGINEERING ADMINISTRATION BUILDING, ROOM 101 • WEST LAFAYETTE, IN 47907-1280



"GOT LOTS OF CURRENT NOW, PETE!"

You never knew what would happen...

says Marvon G. Fenton (BSEE '53), when an ME student went to work in the old motor-generator lab at the back of the EE building. Fenton drew the above cartoon as an undergraduate.

Eaglebeak

by E. J. Tangerman (BSME '29)

There are still a few of us alive who remember Eaglebeak and his prominent proboscis.

Eaglebeak of course knew his nickname and didn't mind it, which was just one of the peculiarities of the late George H. Shepard, a retired Navy officer and a professor in the School of Mechanical Engineering back in the late '20s and early '30s. His special area was industrial management, which included the then-popular time-and-motion studies, and I had him for several courses in my senior year, 1929.

On one occasion we had been assigned a time-and-motion study to be done by teams of two. On the day reports were due, our team had none—the only faulty team. When Eaglebeak mentioned our dilatoriness, my partner, an impulsive Irishman, was quick with this excuse: “We, like most of the other teams, were going to do a study on shaving, but we found to our chagrin that our beards are not yet growing fast enough for an adequate series of test times.”

Eaglebeak smiled but was quite definite: “By next class period, you turn in your study or take a zero.”

The only thing I could think of in the emergency was to study the speed with which one could take off and put on pants. So we lined up several fraternity pledges and set to work, with trousers ranging from Army olive drabs with their laced bottoms to the then-popular Oxford bags, which might have cuffs measuring as much as 22 inches around. Our results purported to show that the 18-inch Oxford bag was fastest and easiest to don, and the Army pants the hardest. The 22-inch Oxford bag had a tendency to wrap around the donning leg and slow up the process.

I dutifully drew up a chart plotting time against cuff opening and added some blue-sky suggestions for speeding up the process, one of which was: “If the buttons are sewn on with sufficient security and buttonholes are sufficiently large, the trousers can be doffed rapidly by simply grasping the belt line at the top front and separating the hands.” (This was before the zipper, which, by the way, I mentioned and discarded as impractical!)

Eaglebeak underscored the sentence with red ink and wrote in the margin “. . .but is likely to cause embarrassment at inopportune moments.” This statement was graced with an asterisk, and at the bottom of the page was the explanation: “In the Navy a captain is allowed one button open, an admiral the whole works. All subordinate officers are required to have buttons sewed on tightly and buttonholes of sufficient smallness to ensure perfect security at all times.”

He gave the study a grade of 116. (Eaglebeak hated the numerical grading system and took a fall out of it at every opportunity.) One of the class members saw the grade and immediately protested. Eaglebeak was utterly bland. He said: "It was a well-executed study and report, meriting 100%. It was late one class session, so I deducted 9%. *But* it included a curve drawing, which was something more than I had requested, so I gave it a bonus 25%."

That settled the matter for the nonce. But the same student, Charlie, who was a grubber that none of us liked, asked at the end of the semester if he could bring a typewriter to the final, protesting that he thought much better on a typewriter.

Said Eaglebeak: "I have permitted reference texts and any other matter to be brought to my finals, so as far as I am concerned, you can bring and use a typewriter. If your classmates object, that is a matter between you and them."

Charlie brought a typewriter and began to type his final. After a few minutes of that noise, several of us got up, tossed Charlie's typewriter out the window, and dumped him after it—from a second-floor classroom into evergreen bushes. Charlie limped back in and completed his exam in ink, like the rest of us.

Lord bless Eaglebeak's memory. He made classes memorable. And he knew his subjects.



Whatever It Takes

by Lori Nottingham (senior, BSCEE)

Over the semesters in EE, several of us had agreed to work on group projects together. In the spring of 1994, Chuck Fraleigh, Nabeel Ibrahim, and I set out to work on our semester project for EE 365, "Digital Computer Design." Our task was to design and simulate a 32-bit microprocessor.

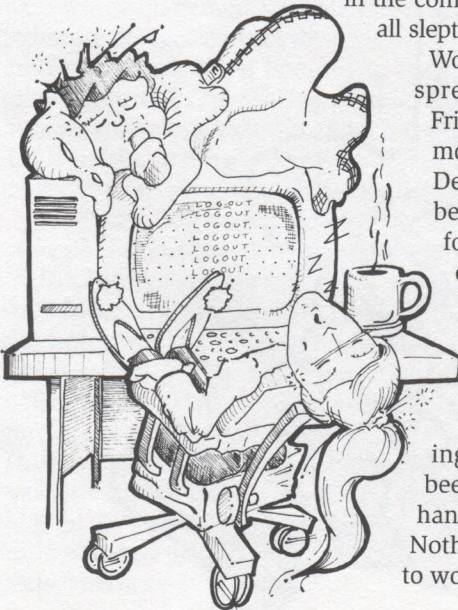
During the second stage of our project, we had to use computers in the Hewlett-Packard lab on campus because of the special software needed to simulate our design. As the deadline approached, we began spending more and more time in the lab. We would leave only when we needed to go to class, eat, or run home to sleep and shower. During the last week, we realized that there wasn't going to be time for us to get a whole lot of sleep and successfully finish the project. We decided that we would take turns sleeping at night in the computer lab.

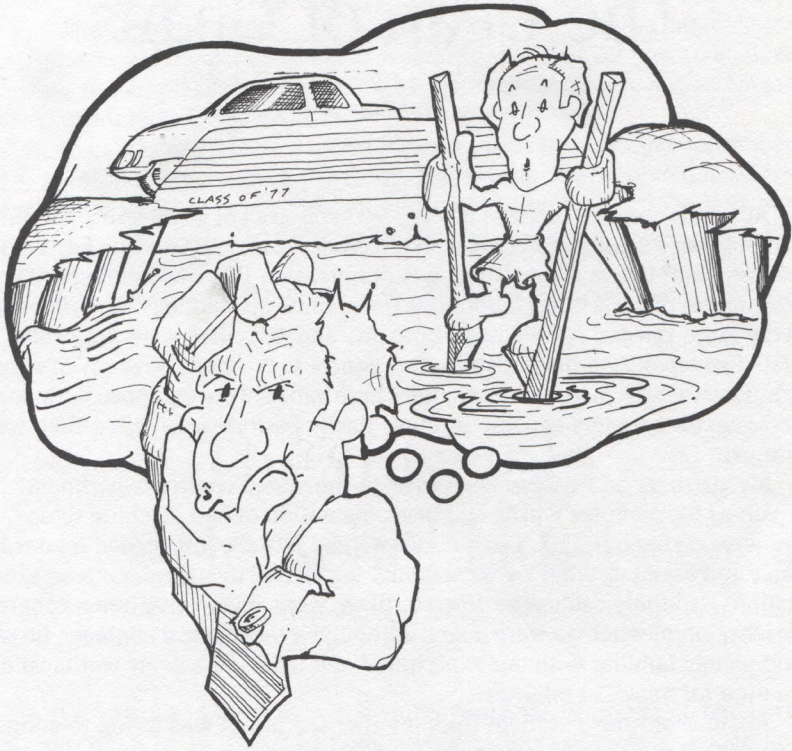
In reality, I don't call sleeping for just one or two hours sleeping. It was more like taking naps. After the first night of doing this, we all realized that the floor of the computer lab and the tile of the atrium in the MSEE building weren't all that comfortable, so the next night, Nabeel brought in a sleeping bag and a pillow.

We were a little surprised: sleeping bags and pillows were not a normal sight in the computer lab. However, that night, we all slept a lot better during our short naps.

Word of our sleeping habits quickly spread throughout the EE school. Friends in the class found it quite humorous; the professor was in shock. Despite the fact that this project had been known as a real time sucker for many years, no one else had ever been bold enough to bring a sleeping bag into the computer lab.

Now, a year later, tales of the 365 group who brought a sleeping bag into the lab are still being told. The professor has even been known to tell the story when handing out the project description. Nothing like motivating the students to work hard from the very beginning!





He'll Take the Long Way Home

by Byron Rice (BSCE '77)

Back in the mid-1970s, I was in a civil engineering course on bridge building. The professor came into class after a test once and announced, "I've got to tell you, this class's test scores are really awful."

One guy raised his hand and asked, "Well, what about partial credit?"

The professor replied, "If a man builds a bridge and it falls down, there's no partial credit.

"In fact," he added, looking the class over, "10 years from now, I won't be driving over any new bridges!"

The Dean of Deans

by LeRoy F. Silva (BSEE '52, PhD '65)
Ball Brothers Professor of Engineering

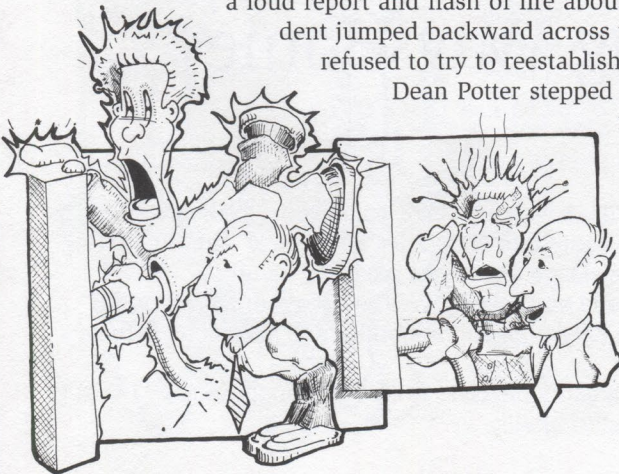
Andrey Potter, the “dean of deans,” was still head of engineering at Purdue when I was a senior in electrical engineering (Spring 1952). One day my lab partners and I were conducting an experiment on Ward-Leonard speed controls in the old machines laboratory (long since dismantled). The machines were large integral-horsepower, both AC and DC, that were connected to slate-insulated, live-front distribution panels that would have given a contemporary OSHA inspector a seizure. These panels were equipped with open-style circuit breakers capable of loud, flashy performance when they were tripped.

My partners and I were engrossed in the speed-control experiment that involved the complex wiring and instrumentation of two machine setups. As we were taking our data, Dean Potter walked into the lab, leaned on our lab table and asked us what we were doing. We started to stammer out an explanation. He kindly calmed us down until we were able to give him a coherent description of what we were doing. Although a mechanical engineer, he was completely familiar with our experiment and led us in a lively technical discussion for about 10 minutes.

About that time a student from another lab group was trying to connect his machine to the DC power source at the distribution panel, using long, heavy-duty power cords with robust pin connectors on either end of the cord. He made a mistake in connecting the cords, so that a dead short across the line resulted. The circuit breaker on the top of the panel responded with a loud report and flash of fire about two feet long. The student jumped backward across the lab and immediately refused to try to reestablish the connection.

Dean Potter stepped in and said, “When you fall off of the horse, get right back on and ride.” He led the student through the reconnection procedure. The student’s hands were shaking violently when the time came to insert the last plug.

The dean gently held the student’s hand and guided the final pin



into the last socket. The dean said, "That wasn't so bad, was it?" He talked to several students and then returned to my bench. He called me by name and looked over my data and made several suggestions on how to analyze the data and report the results. He exited from the laboratory and left many admiring students in his wake.

Eight years later I returned to Purdue as a Ph.D. student after earning an M.S. at MIT, doing a stint in the Army, and getting some industrial experience. I was walking down the hall and met the now-retired Dean Potter. After an eight-year interval, he called me by name and asked about my career and future plans.

He was a giant intellect wrapped in a warm, caring personality.

The Irascible Herschel Hunt

by B. Z. Miller (BSChE '51)

In the 1940s and '50s, Herschel Hunt, professor of physical chemistry, was the bane of all chemical engineering majors. He was a demanding taskmaster in a course that often defied complete comprehension, and he had an acerbic wit, often stinging us in our most vulnerable spots. To this day, whenever Purdue Chem E's get together, each of us will invariably relate Herschel Hunt stories.

My tale: It was late in the spring semester of 1950. I had struggled with P. Chem. 118 all semester and had not done well on my final exam. Dr. Hunt was pondering whether I should pass the course; he therefore called me in for a personal interview.

After considerable discussion, he agreed to pass me provided that I *promise* never to enter the organic chemical industry. Being of sound mind, and quite desperate, I quickly vowed that I would certainly never seek employment in the chemical world. At the time, I was an NROTC student, slated to enter the Marine Corps at graduation. I had no plans for my future employment thereafter.

As it turned out, after my discharge three-plus years later, I accepted (you guessed it!) a position with DuPont's *organic chemical* department. I enjoyed a 36-year career in the manufacture of organic chemicals and marketing.

I never returned to Purdue soon enough to look Dr. Hunt up for a second interview.

The Tuesday Afternoon Tea and Crumpet Club

by Robert E. Bateman (BSAE '46, Honorary Doctorate '93)

When the Navy V-12 program began at Purdue in the mid-1940s, the smallest school on the Purdue campus was aeronautical engineering. The school's second class, numbering 31 students, graduated in February 1946 and was predominantly made up of V-12s. Their lives were managed by the Navy, and they attended the same classes. Because of this and the school's small size, the '46 Aeros bonded together and had many noteworthy experiences.

The Aeros did not cater to individuals who tried to gain a professor's favor by asking "smart" questions. If a student asked a question during class that was interpreted as polishing the apple, another member of the class would quietly say "vote," and if there were three votes for that question, no one spoke to the apple polisher for a week. The procedure was quite effective, and the profs never did figure out what was happening.

The head of the aero school was Professor E. F. ("Pappy") Bruhn, who taught the senior airplane-design course. On the first day of this class (a three-hour lab that met two days a week), he announced that each student was to make a proposal for the building and sale of an airplane of his own creation. The proposal was to include a justification for the plane's use, three view drawings, design specifications, performance characteristics, and structural analysis. It was to be a complete package.

Pappy then startled the class by stating that each student was on his own; there would be no lectures or tests and no attendance taken. For a group of young characters who had led a very regimented academic life, this was freedom beyond belief. One of the by-products of this great lab course was the Tuesday Afternoon Tea and Crumpet Club. The club met regularly at Happy Hollow to discuss aeronautical engineering theory and other important academic subjects. Happy Hollow provided just the right academic setting for such a thoughtful gathering: it was a beautiful site, and more important, it was off campus and provided us a place to stand a keg of beer. This helped to stimulate thought and discussion and at times a headache or two.

No one thought much about airplane design, and no one asked any questions of Pappy because of fear of a vote. Well, finally, when a number of weeks had gone by, the class members decided they ought to get with it—but how to start? There was no textbook. The assignment required thinking. Unheard of!

Well, the students started to really think, some maybe for the first time, and airplane design became the dominant part of their academic lives. They ended up spending far more time on the course than six hours a week. Professor Bruhn taught the class members to approach a problem as if they were in the real world of rapidly changing technology.

On the last day of that class, the students gathered to hear about their grades.

"I have reviewed each of the proposals carefully," Pappy said. "I'm not sure whether any of you will make good airplane designers, but I'm darn sure you'll all make it in sales!"

Most made it in both—thanks to Purdue and Professor Bruhn.

☞ Beware of Hurlled Objects ☞

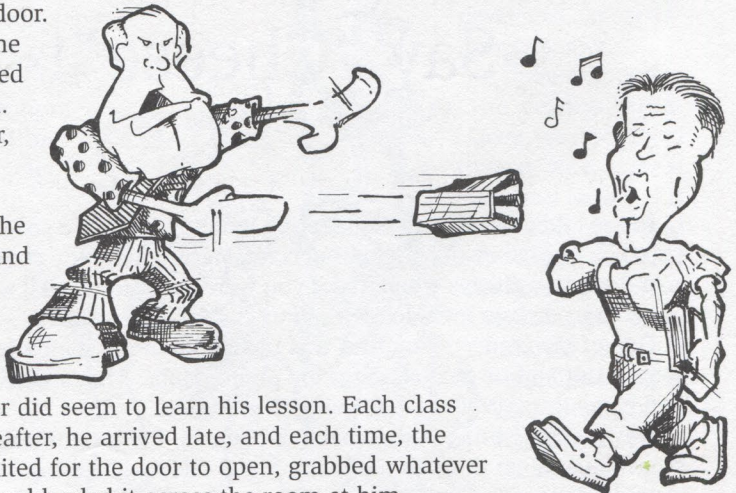
by Robert L. Long (MSNE '59, PhD '62)

During the early '60s, while I was working on a doctorate in nuclear engineering at Purdue, I took a course in nuclear physics. The professor had a thing about students being late to class.

One of my classmates *always* showed up late. As the semester progressed, the professor developed the habit of looking out the second-story window of the room, after the beginning of class, to see if he could spot the student making his way across the mall. Invariably the professor would see the tardy student, stop his lecture, and begin to seethe until the student walked through the door.

One day the student arrived late, as usual. The professor, enraged, grabbed an eraser from the chalkboard and threw it at the guy's head.

The student never did seem to learn his lesson. Each class session thereafter, he arrived late, and each time, the professor waited for the door to open, grabbed whatever was handy, and hurled it across the room at him.



☞ Rube's Law ☞

by Erik Burns (senior, AAE)

Why must the worst always wait until the most inopportune moment to happen? For tales of disaster, destruction, and misfortune, you need look no further than the Rube Goldberg Machine Contests—annual local and national events in which teams of engineering students compete to devise machines that perform a simple operation in the most zany complex way.

The local contest in February of 1991 is an event I will always remember: the teams are all set up on the stage of the Hall of Music, each making its final preparations for the contest. The task: to toast a slice of bread.

Suddenly smoke is seen rising from the Theta Tau entry on the far-right side of the stage. Surely this must be a joke! The fraternity hosting the contest would never let its machine catch on fire.

Many onlookers rushed to the scene. No, nothing had caught fire. The young engineers had instead managed to melt down one of two steam irons that they were using to toast bread. Not only that, but the heat-tempered glass that the team had put on the machine to keep anyone from touching the irons had shattered from the heat, littering the machine. A quick cleanup was all that the team was allowed as the contest was about to get under way.

But the young engineers persevered. Even though only one side of their bread was toasted, they won the contest and competed nationally the next month. But this time, they left the temperature regulators on the irons.

☞ Say "Cheese"! ☞

by Byron Rice (BSCE '77)

In the lobby of the civil engineering building, there's a collection of photographs of each year's graduating class, starting with the class of 1888. As a student, you always wondered if you were going to make it to graduation, to get your picture included with your classmates' pictures.

One of my fondest memories was being told in my senior design class to wear a suit and tie next class for the photographs. That's when the realization came through that I was going to graduate.

Now, when I bring people back to campus, it's a significant part of the tour to take them through the lobby of the civil engineering building—and show them that I'm going to be there forever.

☞ Pig Radiant ☜

*adapted from Comets Amongst the Stars:
Personal Memoirs of the Founding Director of the
Ray W. Herrick Laboratories
by William E. Fontaine*

In the early 1950s, before the idea of Herrick Laboratories was truly born, Fred Andrews, an animal science professor, and I enlisted the help of mechanical engineering professor Wilmer Sibbitt to assist in a study of the heat-transfer characteristics of swine.

Animals in an open field are generally subjected to all three types of heat transfer: conduction, convection, and radiation. We knew how to measure conduction and convection, because we knew the appropriate coefficients required to compute that part of a hog's total heat transfer. However, we needed to determine the heat transferred to a hog through radiation. We guessed that the coefficient would be similar to that of a cylinder, but we wanted a more accurate value.

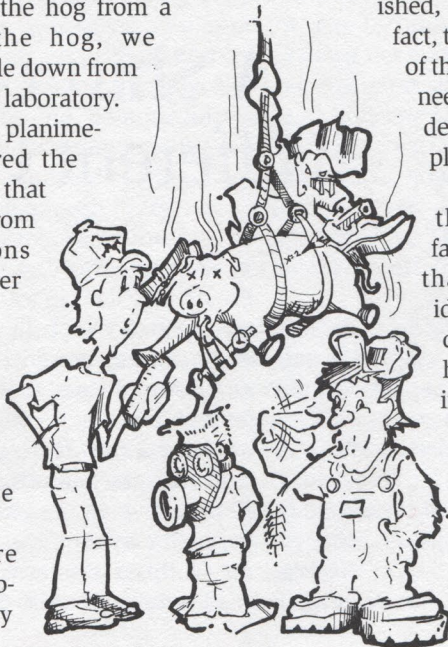
Fred supplied a 200-pound hog. It was killed, embalmed, and delivered to the mechanical engineering building. Our job was to measure the heat transferred to the animal via radiation on a summer day.

In order to measure the total surface area of the hog from a point above the hog, we mounted it upside down from the ceiling of the laboratory. Using an optical planimeter, we measured the area of the hog that could be seen from several positions on the perimeter of a circle inscribed on the floor and then computed the configuration factor for the hog from these areas.

It took more than a week to obtain the necessary

data, and by the time we finished, our laboratory—in fact, the entire basement of the mechanical engineering building—had developed a most unpleasant odor.

Upon computing the configuration factor, we discovered that it was almost identical to that of a cylinder: we could have used a cylinder in figuring the heat transfer due to radiation and still remained within an acceptable margin of error. Hence our work was for naught.



Dr. Winchell and the Schmoo

by G. L. Liedl (BSMSE '55)
Head, School of Materials Engineering

Teaching aids come in all sizes and shapes, as Peter Winchell knew. Throughout the 1960s and '70s, Pete taught the mechanical behavior of solids to students in metallurgical and materials engineering. Ever one to seek means to motivate his students, he took his most infamous teaching aid—the Schmoo—from Al Capp's comic strip *Li'l Abner*.

As Capp rendered it, the Schmoo was an irregularly shaped, eager-to-please blob that would metamorphose into, for example, a plucked chicken ready for the barbecue if it thought you were hungry.

Thus the Schmoo was an ideal object for teaching the deformation of solids. Sketched on the blackboard or on handouts to students, this figure, in Pete's hands, would respond to external forces and conform to any size or shape. Countless materials engineers today remember key points from Pete's lectures because of this comic, changeable character.



Caricature of Peter Winchell drawn in 1976 by Jonathon Andell (BSMSE '76)

A Shirt of a Different Color

by Joan Kelly

As secretary to Peter Winchell, professor of materials engineering, during the mid-1970s, I witnessed one of the more unusual bargains ever made in the cause of men's fashion.

Peter always wore a bow tie, which was usually crooked. One of his classes informed him that bow ties had gone out of style in the 1930s and that pastel shirts were now in style.

"If everyone in this class earns a B or above," Peter replied, "I'll spend one class session taking all

of you to Rhems, and I'll buy five pastel shirts and three long ties."

He thought he was safe because two students never showed up for class and had failed the first exam. The rest of the class got together with those two gents, however, and told them to drop the class—or else the rest of the class was going to make them study every night.

Needless to say, one day Peter showed up at my door with the entire class. Destination? Rhems.

Women IEs Make Their Mark

*by James W. Barany (MSIE '58, PhD '61)
Professor of Industrial Engineering*

In the late 1970s, a significant number of women entered Purdue's industrial engineering program. Rapidly the proportion of women students approached 30 percent of the total IE undergraduate student body.

The influx of women IE students had a profound effect on the way one particular course, Manufacturing Processes I (IE 370), was taught. Traditionally, students were given an aluminum cylinder, and lab sessions were spent on facing, center drilling, and taper boring the end of the workpiece. Later operations included turning different diameters along the length of the part, taper turning, contour turning, and knurling the end section. At the end of the lab assignments, the workpieces were graded and recycled.

As increasing numbers of women took the course, however, they demonstrated a personal interest in their accomplishments by demanding that the laboratory workpieces be returned to them after grading. The students wanted to display them with pride in their dormitory rooms or in their parents' homes as examples of their handiwork.

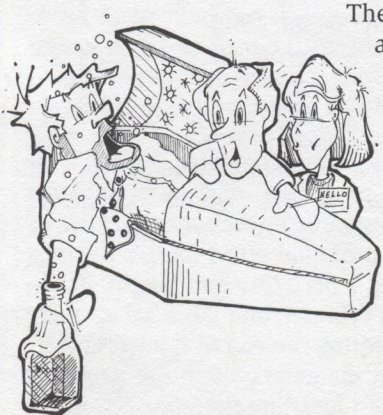
Returning the workpieces posed a problem to the lab instructors: it would be possible for a different student to submit a previously graded workpiece. But the women took their complaint to Wilbur L. Meier, head of the School of Industrial Engineering, and a simple compromise was reached: after each workpiece was graded, an inspection seal was stamped on the end of the cylinder that was held inside the chuck.

Interestingly enough, practically all of the male students began claiming their laboratory workpieces with as much pride as their female counterparts—and the practice of returning a tangible workpiece to students at the semester's end is still followed in many IE manufacturing-processes labs.

A Tisket, a Tasket, a Prof Is in the Casket

*by Victor Goldschmidt, Professor of Mechanical Engineering,
and Marion Scott, Professor Emeritus of Civil Engineering*

During the World War II years, an ME professor was conducting research with Hillenbrand Industries on the design of caskets and a means of effectively sealing them to be waterproof. One day the professor, who had a bottle stashed in his lab and who was fond of imbibing, got tipsy—and then drowsy. He decided to climb into the casket to take a nap.



The professor was jolted from a deep sleep by a sudden noise. Harry Solberg, the head of the School of Mechanical Engineering at the time, was escorting a guest through the building's facilities and had stopped by the professor's lab. The professor shot up out of the casket, scaring the living daylight out of his uninvited guests.

What occurred between him and his boss after that episode remains unknown.

Hawk-eyed Hockema

by Marshall C. Harrold (BSME '31)

In the 1930s era, one of the most popular profs in mechanical engineering was Frank Hockema. On final exams he always had essay questions that made you fill one of those exam folders to the last line or into another copy. No time off for quick answers.

During one final exam I was well into a second folder, along about page seven or eight, when I added in parentheses, "How can you read all this stuff? If you see this, I will give you a quarter." With a large lecture class, the stack of exam booklets must have been formidable.

A couple of days later I met Frank in the hall.

"You got an A," he said. "And you owe me a quarter."

Rude Awakening

*by James W. Barany (MSIE '58, PhD '61)
Professor of Industrial Engineering*

Orville Lascoe, better known as O. D. Lascoe, joined the general engineering faculty in 1942. After World War II, he redesigned the manufacturing processes laboratory in the Michael Golden Engineering Laboratories and Shops, traveling more than 40,000 miles in search of war-surplus machine tools and securing close to \$2,500,000 worth of equipment. He was able to obtain prototypes of tools from many companies in the National Machine Tool Builders Association to demonstrate the latest technology in his laboratory.

One new process that intrigued Professor Lascoe was a version of explosive forming that used a high-energy electrical discharge to shape a metal component part. The workpiece was clamped to a die, and the back side of the die chamber was evacuated, causing a vacuum. A container was placed over the workpiece-die assembly and filled with a pressure-transmitting fluid. Electrical energy stored in a bank of capacitors released a spark of large intensity between two electrodes, causing a controlled explosion. The resulting high-energy shock wave transmitted through the fluid medium caused the workpiece to deform into the die chamber. The machine occupied approximately 40 square feet of space in Room 1308, a laboratory in Michael Golden Labs, and was close to seven feet high.

Professor Lascoe fabricated a smaller version of an explosive forming machine that used a die activated by a .38-caliber blank cartridge. This model, which he placed in the MGL 1310 classroom adjacent to Room 1308, produced a small ashtray from lightweight aluminum stock.

One day Professor Lascoe began his classroom lecture on the principles of explosive forming and, with the door shut, droned on in a boring fashion.

The students lost interest. Some started to doze.

Just as everyone was sitting half asleep, Professor Lascoe nonchalantly walked past his mockup model and pulled the lanyard to trip the firing mechanism for the .38-caliber cartridge.

There was a deafening explosion. The students jumped to their feet.

Professor Lascoe grinned, removed the formed aluminum ashtray from the die, held it up high over his head to show the students, and said, "Now that you understand the principles of explosive forming, let's go next door and see the actual machine in the lab."

The demonstration left a profound impression upon the students, notwithstanding some severe ringing of the ears that lasted, in some cases, several hours. However, they never told their junior classmates, so that the latter would be equally surprised when O. D. Lascoe demonstrated the explosive forming process in class the next semester.

An A's Nice, but Where's the Nobel?

by Kenneth Hookanson (BSChE '39)

During the Depression years, jobs for engineers were few and far between. Our diligent professors were continually interviewing industry to see what they wanted in their new engineers. As a result, more and more courses were added to the curriculum, and most engineering students carried more than 20 hours each semester. In the School of Chemical Engineering, with all our labs, we were a very busy bunch.

Our school had us take 10 semester hours between our junior and senior years during the summer. I was in the metallurgical option, and during the summer of 1938, Dr. John Bray assigned three of us to work on a method to separate nickel oxide, iron oxide, and chromium oxide from a complex ore found in Cuba. Cuba had contracted with the Purdue Research Foundation many years before for this work. Every summer for many years other students had been given this project, with no success.

We divided our reading research among the three elements. Mine was chromium. One day in an obscure paper I read about work that had been done on making chromium oxide into a colloid having a charge particle. The thought occurred to me that if we could grind this ore fine enough and treat it the same way, we might separate out the chromium oxide by electroplating.

After grinding and grinding, we went to the chem lab to continue our work. We all had had a year of EE, but that was spent analyzing delta and star configurations of transformers. Studying AC and DC motors left us ill prepared for setting up our electrochemical cell. (We had used these cells in several labs, but they were with proven lab equipment and lab manuals.) We treated the ore and placed it in solution in a large beaker, adjusted our homemade anode and cathode plates, and connected up to our power source. When we turned the power on, the contents blew all over the lab.

Fortunately, no one was injured.

It didn't take much intelligence to realize that we were using too high a voltage, so we found a rheostat to put in the circuit and, undaunted, started again, gradually decreasing the resistance in the rheostat until we started to see some action in the cell. Sure enough, the colloid was plating out, but it would not stick to the plate.

With limited knowledge of this electrochemical phenomenon, we were at loss to know how to correct the problem, so we resorted to empirical research. (Try anything—it might work!) We added most everything avail-

able, to no avail. Two of us had other things to do, so we left the one remaining member to continue what now appeared to be a hopeless effort.

About two hours later, I got a phone call from our stalwart compatriot to come over quickly. Young legs carried me to the lab to be shown the cell with what we hoped was chromium oxide. He had added an alcohol of some kind to the solution, and it in some mysterious way had provided the answer.

We had to wait until the next day to run an analysis, but we had succeeded. The substance was chromium oxide.

Of course, we got a top grade for that effort, but I did not get what I wanted most—for us to be brought in front of the class by Dr. Bray and given a Nobel Prize.

“Sleepy-eyes” McCormick

by G. L. Liedl (BSMSE '55)
Head, School of Materials Engineering

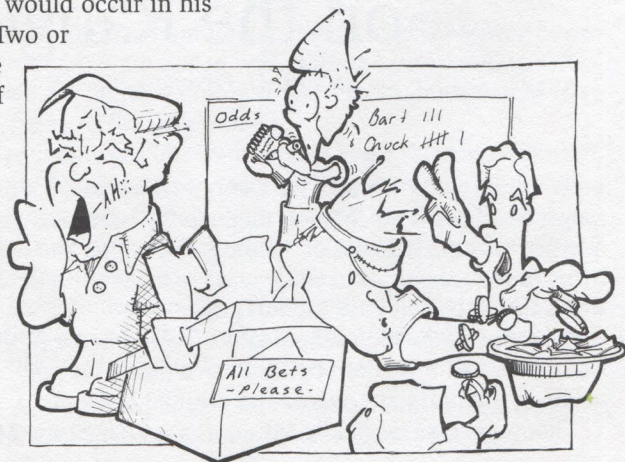
In the early 1950s, John McCormick, one of Purdue's metallurgical engineering faculty members, had a habit that resulted in some active betting by the students.

During his lectures he would pause after every phrase or so with a characteristic *ah*. This habit made Professor McCormick's classroom presentation conducive to sleeping, thus his affectionate nickname.

Being inventive, the students arranged a system to make his lectures more entertaining. At the start of each class, they would place bets on the number of *ahs* that would occur in his 50-minute lecture. Two or

three students were assigned the task of counting. At the end of the class period, the counters provided an official count, and a winner was named.

Variations on this theme kept most of the class awake!



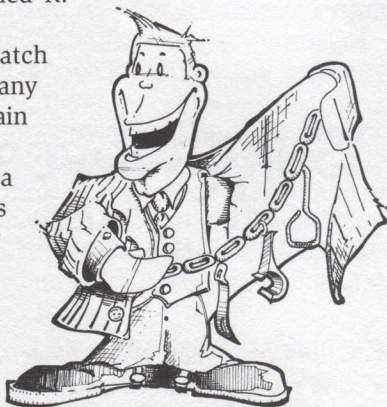
👉 Razzing Dr. Shreve 👈

by Dick Grace (BSMetE '51)
Director, Undergraduate Studies Program

A “Chem and Met” annual tradition was the spring Razz Banquet, when students poked good-natured fun at their professors. No one escaped the watchful eyes of the students, especially the head of the school, R. Norris Shreve. (Behind his back, he was called R. “Nosey.”)

Norris was known for his gold watch chain, which draped across his vest. Many honorary keys were displayed on the chain as evidence of his scholarly endeavors.

At the Razz Banquet one year, circa 1955, the senior impersonating Norris wore a “watch chain” that normally would have been used to chain a bicycle. The scholarly keys? Strung all along the chain in grand style were, of course, the finest of beer-bottle and beer-can openers.



👉 Home, Home on the Range 👈

by Richard D. Freeman (BSATR '50)

Around 1943 I worked for George Hawkins on Purdue’s machine-gun range. Hawkins, a mechanical engineering professor and later dean of engineering, was the big boss of the program, which had been set up by the U.S. Army ordnance people to study ways to make the guns fire more rapidly. He was a dedicated, intense kind of guy.

I was one of the high school kids involved in the project. We were kind of like slaves, but it was fun being a slave there. We got the guns ready to fire, polished the brass afterward, and cleaned the guns.

The range was originally set up at a corner of the ME building, and the

guns were fired diagonally across the square toward the American Railway building. They made a horrendous amount of noise, and people started worrying about ricochets, so George looked around and got some land for the range by Ross-Ade Stadium, where the Grand Prix track is now located. There were three concrete buildings, and we fired inside a firing room, the bullets traveling the length of one of the long, narrow buildings. Even in that location the sound of the guns could be heard throughout West Lafayette.

The ammunition was very heavy—almost all of it was .50-caliber—and so was the rest of the equipment. One day I was moving a battery that weighed around 20 pounds, and instead of easing it to the floor, I carelessly dropped it from about six inches above the floor.

Acid squirted straight up into my eye. I let out a scream.

George was all over me like a wet blanket. He had me by the scruff of the neck, took me over to a sink where you wash out the mops, and flushed out my eyes.

Then he hurried me over to see Doc Miller, a gruff physician whose office was in the basement of the administration building. “Dumb kid!” said the doc.

George Hawkins’ rapid response saved my sight. He was a man to ride the river with.

A Lab Test Backfires

by Harry G. Gibson

Associate Professor of Agricultural Engineering

When ag engineering professor Ray Lien was teaching AGEN 340, “Farm Power Units,” back in the mid-1970s, he once set up a lab test that backfired. Literally.*

The lab involved running a dynamometer test (which measures horsepower) on a spark-ignition engine fueled with liquified petroleum gas. Professor Lien misadjusted the ignition timing so that his students would have to troubleshoot the engine to find the problem.

The students turned on the gas but were unable to get the engine started. The gas, of course, was being pumped through the carburetor and engine into the exhaust system in the ceiling. After several unsuccessful student attempts, Ray finally tried to start the engine himself after correctly (or incorrectly) adjusting the timing.

The engine backfired into the exhaust. The gas that had accumulated in the ceiling exhaust stack ignited. The resulting explosion, which took out a few ceiling tiles, startled everyone in the room—none more than Ray!

**Note to you internal-combustion-engine purists: Yes, “backfiring” means “back through the carburetor.” I’m taking editorial license here and using the general public’s term.*

✎ The Flying Denture ✎

by LeRoy F. Silva (BSEE '52, PhD '65)
Ball Brothers Professor of Engineering

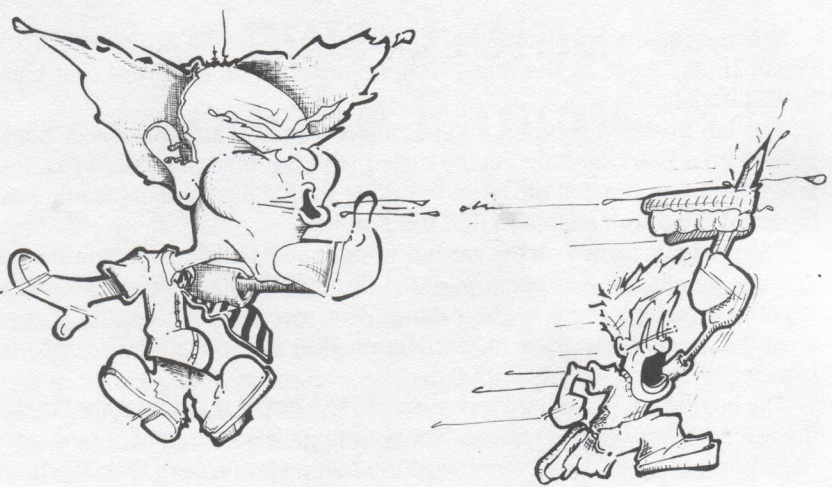
Professor David Curtner taught the junior and senior courses in electrical design during the time I was an undergraduate. In particular, he taught a course in which the students executed the complete design of a large (25–50 hp) DC machine in excruciating detail. The course was taught in a drafting laboratory instead of the traditional lecture-format classroom since the design process involved considerable mechanical drawing as well as vigorous slide rule pumping.

The process became somewhat tedious as the semester wore on, but Professor Curtner kept our noses to the grindstone with dry humor and frequent benedictions, with hand held over his heart, to “Lord Alfred.” This was in honor of Professor Alfred Still, the author of the venerable textbook used in the course.

One day Professor Curtner outdid himself.

During one of his lectures he sneezed. His upper plate flew out of his mouth, bounced off on one of the drafting tables, and was deftly speared in midair by one of the students in the second row of tables. The student proudly returned the wayward teeth.

The unflappable professor wiped off the denture, popped it back into his mouth, and continued his lecture without pause. The class was in hysterics, but the lecture went on nonetheless.



Long Day's Journey Into Higher Insurance Premiums

by Steve Keller (senior, CEE) and Alex Bentley (senior, ChE)

Every September the Purdue Engineering Student Council (PESC) sponsors the Industrial Roundtable, the nation's largest student-organized job fair. The event, held annually for the past 15 years, attracts approximately 180 companies and about 8,000 students. Each year something happens that makes the job fair legendary.

At the 1993 Industrial Roundtable, PESC inaugurated the costly tradition of having automobile accidents.

Minutes before the scholarship breakfast—the official welcoming from the Industrial Roundtable staff to the corporate representatives—Andy Cipra, then president of PESC, backed a university-owned van out of a parking space so quickly that he crashed into the car behind him.

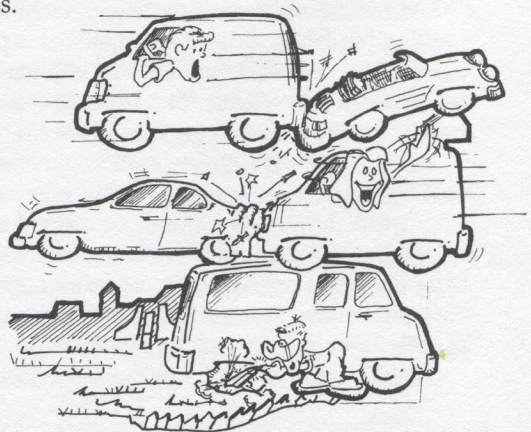
He hit the car hard and knocked it over the concrete parking marker. He had to leave a note for the car's driver because he was late to the breakfast, where he was due to give the introduction. He arrived at the breakfast only a few minutes early and hastily prepared his as-yet unwritten speech.

The tradition of PESC automobile accidents carried over into the next year. PESC member Andrew Oxtoby caused a fender bender when he hit a small car while driving yet another university-owned van.

The job fair continued without incident until it came time for PESC to clean up. Cleaning up the entire Memorial Mall after 8,000 students have spent the day there is a long, tedious process.

At about 9 p.m., when everything was picked up and loaded into one of the university vans, everyone was ready to go home. Then PESC member Alex Bentley backed the van up and proceeded to drive over a wooden stake, thereby puncturing a tire.

The university still allows PESC to rent vehicles—but not without holding its breath.



Anything You Can Carry

by William K. LeBold (PhD '57)
Professor of Freshman Engineering

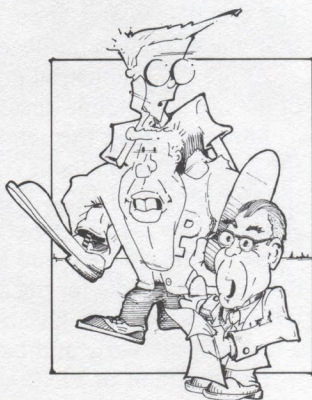
One of my favorite anecdotes is about Dean George Hawkins. In 1951, when he was a mechanical engineering professor, George was teaching thermodynamics in an era when some faculty members were trying to eliminate closed-book exams.

He announced to his class, "You can bring anything to the final you can carry." One of his students came in with a Tau Beta Pi senior on his back. George carried out his part of the bargain, but he was a little more cautious the next time he gave an open-book exam!

Anything You Can Carry?

(Chem E Version)

by Alexander D. Jung (BSChE '51)



As a chemical engineering undergraduate a hundred years ago (actually from 1947 to 1951), I took physical chemistry from Dr. Herschel Hunt.

His nickname among us was "machine gun," because he had the unnerving tendency to hold an eraser in his left hand, and chalk in his right hand as he scribbled furiously on the blackboard with innumerable equations, notes, etc. The problem was that he simultaneously erased what he had just written as he continued to write with his right hand.

Worst of all were his tests. Physical chemistry was by far the most difficult course anyone could possibly take at Purdue at the time. Dr. Hunt's tests were all open-book, and he always said that you could use anything that you could carry into the classroom as a reference. The story (probably true) goes that one enterprising student carried a P. Chem. doctoral candidate into class, thus fulfilling the reference requirement, since it did not specifically preclude carrying in humans.

The other story, which I witnessed myself, concerned Dr. Hunt's usual pre-

test admonition that previous-test files in Cary Hall, fraternities, etc., were useless. "I give the same tests each year," he said, "but I change the answers!"

It was a rarity to score above 50 percent on his tests. Fortunately, he graded on a curve.

Getting Aloft: The Purdue Glider Club

by Bob Antheil (BSME '33)

At Purdue my buddies and I used to huddle try to dream up something that was "different." Well, one time we came up with a honey for its day: a glider club.

We couldn't seem to generate any faculty backing, but we decided to go ahead anyhow, and we put an ad in the *Exponent* that we would have an organizational meeting in old Heavilon Hall. We were delighted with a turnout of about 25 students. We elected Nelson Swarr (BSEE '34) president, and I was elected treasurer, with the job of collecting enough money to buy a glider. We made an assessment of \$10 per member.

By the fall of my senior year we had 11 members, and I had collected the grand sum of \$125 to buy the glider. Somebody came up with an ad in the South Bend paper where a man had two Rainbow gliders that he would be glad to sell for \$250 apiece. It seemed hopeless, so Nelse and Fred "Whitey" Motsch (BSChE '33) and I had a meeting in the old Lahr bar to decide what to do.

Those were Prohibition days, but the Lahr bar served "Near Beer," and Whitey was adept at slipping test tubes of alcohol from the chem lab into his jacket pocket. Some of his alcohol put into the top of the bottle and shaken up well made a pretty potent drink. It tasted awful, but after a couple of these, the glider problem didn't seem so impossible.

The consensus of the meeting was that I should call the guy up and offer him \$125, cash, for both gliders. So I did. Surprise! We had a deal. The man delivered both gliders to West Lafayette the following Monday.

One of our members talked his dad into letting us fly in his wheat field nearby, and since the field was perfectly flat, we elected the shock-cord method of getting the gliders into the air. We bought an ancient ragtop Buick for \$20 and were ready to go.

As it turned out, having two gliders was an asset. Almost every flight wound up in some kind of damage, and one glider was always being repaired while the other was flying.

➤ Egg Bandits ➤

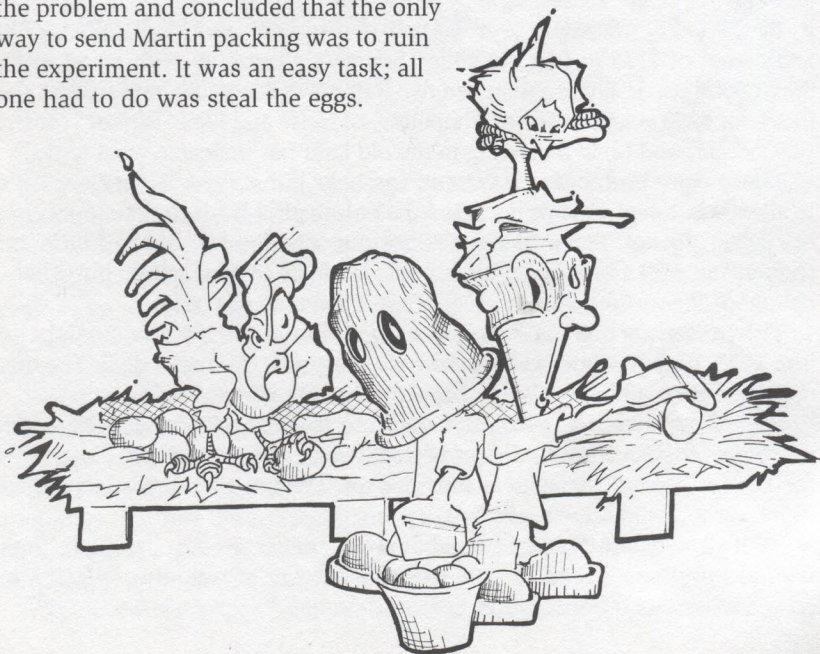
*adapted from Comets Amongst the Stars:
Personal Memoirs of the Founding Director of the
Ray W. Herrick Laboratories
by William E. Fontaine*

In the early 1960s, as Herrick Laboratories began preparing to add an anechoic chamber to its facilities, we found that the designated site for the chamber was in demand by other groups on campus.

For example, the fine arts department wanted the room for a sculpting laboratory. Others in the nearby School of Agriculture, such as faculty in the poultry department, felt that they had a stronger claim to the room since it had once been the livestock pavilion.

Before construction of the anechoic chamber could begin, a large roadblock was thrown in our path. J. Holmes Martin, head of the poultry department, had hopes of studying the effects of various diets on egg production and feed efficiency in laying hens. He moved a construction crew and materials into the pavilion and constructed a series of cages almost overnight that literally filled the entire pavilion. Martin now had squatter's rights and refused to move. The question was, how to get rid of him?

My colleague Art Smith and I considered the problem and concluded that the only way to send Martin packing was to ruin the experiment. It was an easy task; all one had to do was steal the eggs.



Art and I removed the eggs from the pens every day. One would gather the eggs while the other stood watch. We never stole the eggs at the same time but varied our escapades over a complete 24-hour period. They never did catch us. The hens were quite productive; we had nearly a water bucket full of eggs to dispose of every 24 hours. We were giving eggs away to everyone we knew.

One morning I came to work after emptying the pens of eggs late the night before to find a big sign hung over the pens reading THESE CHICKENS HAVE BEEN FED RADIOACTIVE DIETS.

This made no difference to us. The disappearance of the eggs continued until Martin finally gave up and moved his experiment out of the pavilion. Construction of our new acoustic laboratory was initiated immediately thereafter.

Call Letters

*by Dick Grace (BSMetE '51)
Founding Head, IDE*

When the Division of Interdisciplinary Engineering Studies was created in 1969, everyone anticipated that it would have a shortened name, an easy abbreviation. Dean of Engineering Richard J. Grosh, Associate Dean Marion B. Scott, and I concluded that “IDE” would be the ideal colloquial name for the new division. What we didn’t predict at the time was the use (and misuse) of those three simple letters in the years ahead.

First, the obvious: **ID** stood for “interdisciplinary,” **E** for “engineering.” The code IDE worked its way through the Office of the Registrar, Schedules and Space, the university editor, administrative computing—in short, the entire university.

Two camps of wags, mostly good-natured engineering students and faculty members, poked fun at the start-up of the new division:

- One group labeled IDE students with the term “I’ll **D**ecide **E**ventually,” a reference to the general nature of the curricular requirements.
- A vocal group of traditionalists thought that the creation of IDE was only three quarters of a good **IDEA**.

Another variation on the IDE theme occurred in 1981, when students created an organization to represent their interests and provide a social forum. The name of the club, of course, was **IDEAS**: the Interdisciplinary Engineering Association of Students.

Twenty-six years and 1,791 graduates later, that comfortable abbreviation, IDE, continues to be spoken by generations of engineering students and alumni.

Flush With Victory, Aeros

➤ Earn a Nickname ➤

by Robert E. Bateman (BSAE '46, Honorary Doctorate '93)

The aeronautical engineering students in the class of '46 were not without imagination. In the fall of 1945, the seniors of the aero school decided to enter the Senior Parade contest at the homecoming football game. This event was usually won by the MEs, because they were the largest school and had the most resources.

After running wind tunnel tests and structural analyses of many ideas, the Aeros decided that they would have to take a nonengineering approach and go for music. This was hardly a well-thought-out decision, since only three out of the class could read music.

The students were creative, however: they went to West Lafayette High School and on bended knee obtained the loan of a number of instruments and set up rehearsals. On the big day, they marched in the parade. The aero band was heavy on drums and tubas, but with one trumpet, one saxophone, and one flute the group marched to victory.

The MEs were outraged. Henceforth they referred to the aero school, which was in a small building behind the ME school, as the ME outhouse.

➤ No Holes Barred ➤

by L. B. Ritchey (BSME '36)

In the early '30s there was a no-smoking rule on campus. ME professor Dave Clark, who was the nicest guy around but a little on the absentminded side, smoked a pipe. He sometimes forgot not to smoke the pipe on campus, and when he was told about it, he would stick the pipe in his coat pocket. All of his overcoats had a hole burned through each pocket because he had forgotten to take the pipe out when he got to his office.

Dr. Martin Gets His Gun

L. A. "Gus" Higley (BSEE '57)

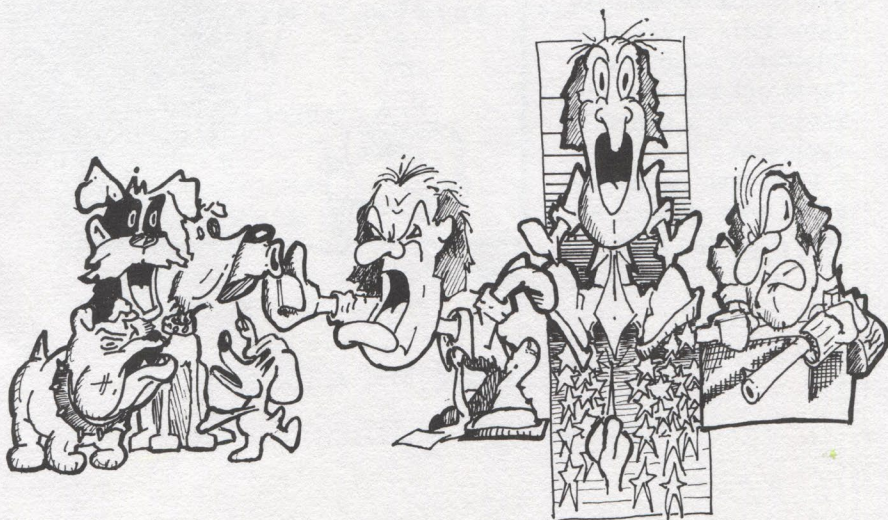
In the spring of 1954 in freshman chemistry lectures, Dr. Frank Martin held forth in one of the "temporary" buildings down by Cary Hall. The lectures were large, with probably at least a hundred students. We had a mix of Korean War vets in the class, so the average age was higher than the norm. The vets were more confident than most of us freshmen—and definitely more assertive.

On one particular day, a pack of dogs gathered outside the side door near the podium and went into full song. The noise made it hard for Dr. Martin to lecture, and he opened the door and shouted at the dogs.

One of the vets sneaked up on Dr. Martin, pinched his behind, and barked. Sure that he had been attacked by a dog, the professor jumped out the door and into the yard outside.

The laughter clued him in that he had been had. With some obvious attempt to recover his dignity, he stalked into the room and out into the office area. He emerged for all the world like Judge Roy Bean with a large pistol, which he placed on the lectern with some deliberation—and with the implied warning that he intended to maintain order even to the extent of extreme measures.

That's how I remember it, anyhow.



➤ To Dye For ➤

by Robert J. Grissman (BSEE '57, MSEE '63)

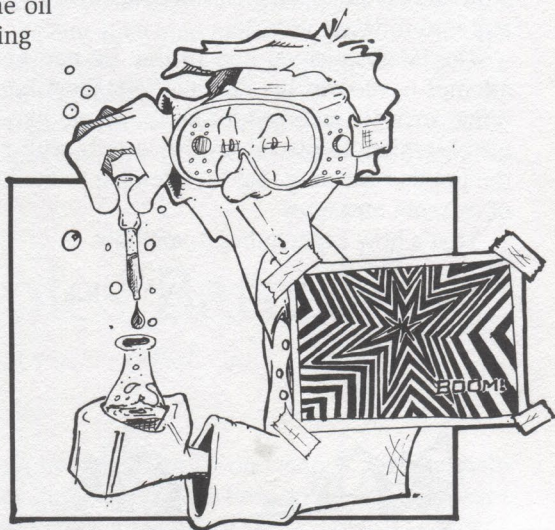
I didn't blow up a lab, but I did get people's attention. (Of course, I'll deny it was me if there is any ramification.) This happened way back in history: Chem 101, 1954.

We had been given unknown liquids and told to use what we had learned to identify them. I tried sulfuric acid. The sulfur settled out. I continued trying various tests without success. Finally I put the test sample in my lab drawer, with the intent to work on it later.

Some sessions after that, we were making the green dye that downed pilots put in the water to aid in locating them. The process required the use of an oil bath. While the solution was cooking, I thought of the unknown liquid. It had turned into a hard crystalline-looking white solid. I mixed up a solution of aqua regia, using lab acids, and poured it into the test tube containing the unknown. Nothing happened, so I put it into the oil bath along with the processing green dye.

Just before it exploded, the white solid was floating in a red liquid, and green gas was coming out of the unknown. Luckily, nobody was hurt in any way—but lab books in the immediate area were splashed a bright green. Turns out that the unknown was a mercuric compound.

From then on, all my setups were checked before I could run a test.



Your contribution makes a difference.

The following is a sampling of equipment, programming, and activities that alumni helped fund in the past year.

Aeronautics & Astronautics

- equipment for new faculty
- development of instructional labs

Agricultural and Biological Engineering

- student plant tour
- engineering workstations

Chemical Engineering

- multimedia technology in the classroom
- undergraduate-lab upgrade

Civil Engineering

- permanent endowment for labs
- student programs, such as ASCE's concrete-canoe contest

Construction Engineering & Management

- purchase of books for CEM library
- support for the undergraduate internship program

Electrical and Computer Engineering

- development of an open-access student computer lab
- student support for conference presentations, workstations, and lab equipment

Freshman Engineering

- support for Minority and Women in Engineering Programs
- tutoring

Industrial Engineering

- student résumé book for employers
- equipment for human-factors lab

Interdisciplinary Engineering

- computer hardware and software to assist students in job searches
- counseling services

Materials Engineering

- Undergraduate Materials Processing Initiative for course development
- student recognition

Mechanical Engineering

- equipment and software upgrades for undergraduate labs
- equipment for a student "special projects" shop

Nuclear Engineering

- lab start-ups for new faculty
- computer software for use in teaching



Illustrations by Matt Harshbarger

Purdue is an equal access/equal opportunity university.