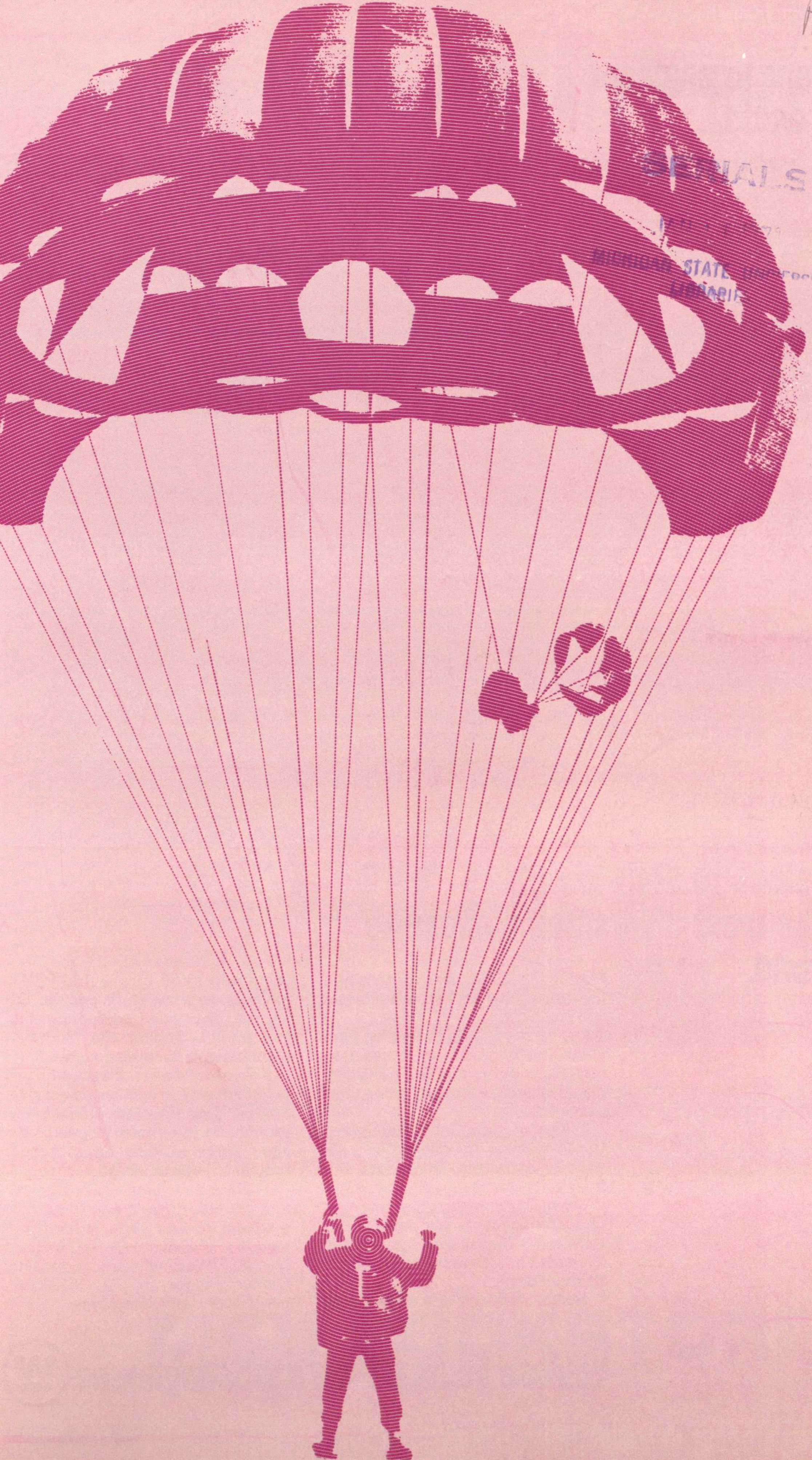


The spartan engineer

Scientific Ecologically Open Minded Magazine

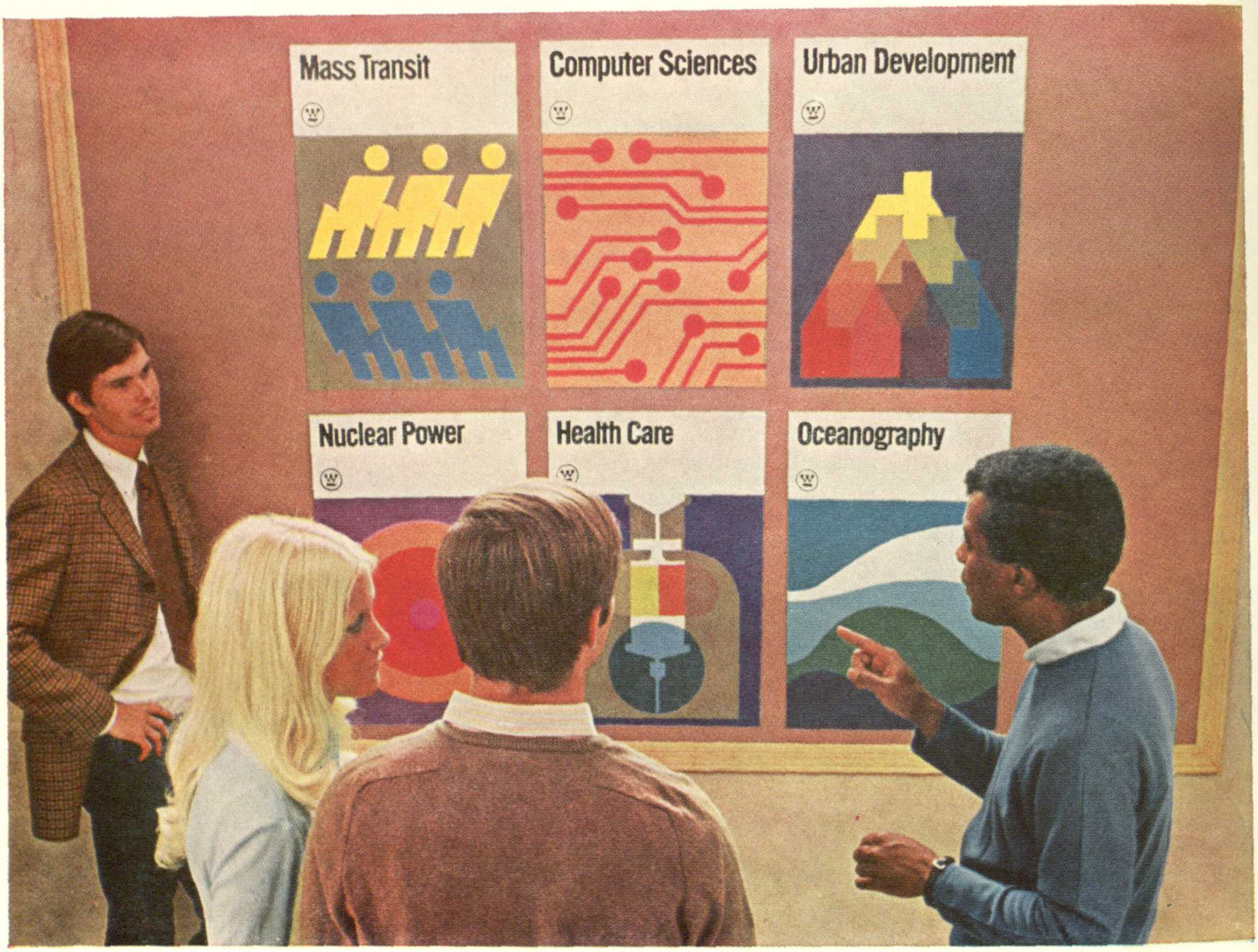
Member of the Engineering College Magazines Associated

MICHIGAN STATE UNIVERSITY

40¢

DECEMBER, 1970

If you want to engineer a better world...



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spartan engineer

The Scientific Ecologically Open Minded Magazine

Member of the Engineering College Magazines Associated

MICHIGAN STATE UNIVERSITY
VOLUME 24
NUMBER 2
DECEMBER, 1970

This month's cover depicts John Medler during a Skydiving exercise. Feature article starts on page 6.

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FEATURES

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SPARTAN ENGINEER: A definition

Spar·tan (spär′tən), *adj.* Also, **Spar·tan·ic** (spär-tan′ik). **1.** of or pertaining to Sparta or its people. **2.** suggestive of the ancient Spartans; sternly disciplined and rigorously simple, frugal, or austere. **3.** brave; undaunted. —*n.* **4.** a native or inhabitant of Sparta. **5.** a person of Spartan characteristics. [< L *Spartān(us)*, equiv. to *Spart(a)* SPARTA + *-ānus* -AN] —**Spar′tan·ism,** *n.* —**Spar′tan·ly, Spar·tan′i·cal·ly,** *adv.*

Spar·tan En·gi·neer (spär′tən) (en′jə nēr′)

n. **1.** Spartan Engineer is a magazine by the students in the College of Engineering at Michigan State University. **2.** it is manned by any and all interested students who will volunteer their services to help in a cause that is beneficial to all engineering students on the East Lansing campus. **3.** the objective of the magazine is to communicate the exchange of ideas between: **a.** students and professors **b.** professors and professors **c.** departments **d.** colleges within the university **4.** Spartan Engineer believes that the engineering *world* can no longer neglect the social interactions of the outside *world.* **5.** Spartan Engineer dedicates itself to initiating programs within its bounds that not only seek to relate the latest discoveries of pure science, but also show a genuine concern for the questions troubling our environment. **6.** Spartan Engineer identifies with the American ideal of free enterprise and its *attempt to perfect the efforts of mankind* in constructing a new world through human engineering.

SKYDIVING

Well that is the way I felt about skydiving, at least until I went to the *indoctrination* meeting. The Michigan State Sport Parachute Club held its spring organizational meeting in mid-April. It gave me an anxious feeling to know I was getting into something new. At the first meeting movies were shown about the different facets of the sport. It was then that I felt that this could be the ultimate sport.

After the movie was over some club members gave a brief orientation about the equipment. The main canopy in a student *rig* is either a 28' or 35' diameter ripstop nylon parachute depending on his weight. There are drive modifications in the back of the canopy which give the parachute a forward speed. (These modifications are panels cut out in various sizes, depending on the drive that is desired for each canopy.) The reserve chute is a 24' diameter unmodified ripstop canopy. It is worn on the front of the harness where it is easily accessable if needed. The reserve chute has an automatic opening device which opens the reserve at 1,000 feet at a velocity of 60 m.p.h. Boots and crash helmets are essential. Goggles, coveralls and gloves are also used depending on conditions.

The club gives ground training on weekends at Jewett Field, a small grass landing strip just south of Mason. Saturday was cloudy and cold but I decided to ignore the weather and go out anyway. As I arrived at the field I noticed that everyone was wondering around looking at the sky every once in a while. I later learned this is a ritual that is performed by the members when they try to conjure up some blue sky. I put on coveralls and prepared for training. The first thing I learned was the stable free fall position. This is an aerodynamically stable body position which allows the jumper to control his fall with arms and legs extended, back arched and face down. Having mastered the stable free fall position, I moved on to the exit procedures. This was a difficult maneuver because I had 40 pounds of bulky equipment on me. I learned parachute landing falls next which was the hardest part of the training since I had to jump off a 5' platform and land correctly. Reserve deployment was next. I had to manually throw out my reserve chute if there was a malfunction of the main canopy. After I was thoroughly trained by a qualified jumpmaster I was quizzed to make sure I learned the necessary basics.

After two frustrating weeks of waiting for clear skies, the instructors decided that I should have the opportunity to take my first jump. My first five jumps were to be on static line. The static line is a 15', 5,000 pound test nylon webbing attached to the plane which automatically pulls the parachute out of its container. At 3,000 feet the pilot opened the door and told us we were on the jump run. The jumpmaster told me to put my feet outside. It sure was windy out there. When the plane was over the exit point the jumpmaster told me to stand outside, and a few seconds later I heard the command *go!* and stepped into space. I felt total freedom the next five seconds. When the chute opened the only thing I noticed was the quietness up there. I knew I had to jump again and 118 jumps later I believe skydiving is the ultimate sport.

Once a jumper has enough experience, he can attempt accuracy work. Most meets are for accuracy jumping. The object of this type of jumping for a jumper is to maneuver his canopy

Continued on page 18

ANYONE WHO WOULD JUMP OUT OF A PERFECTLY GOOD AIRPLANE MUST BE CRAZY!!!

by JOHN R. MEDLER

John is a senior in M.E. He is now the President of ASME and Chairman of the Dean's Student Advisory Committee.

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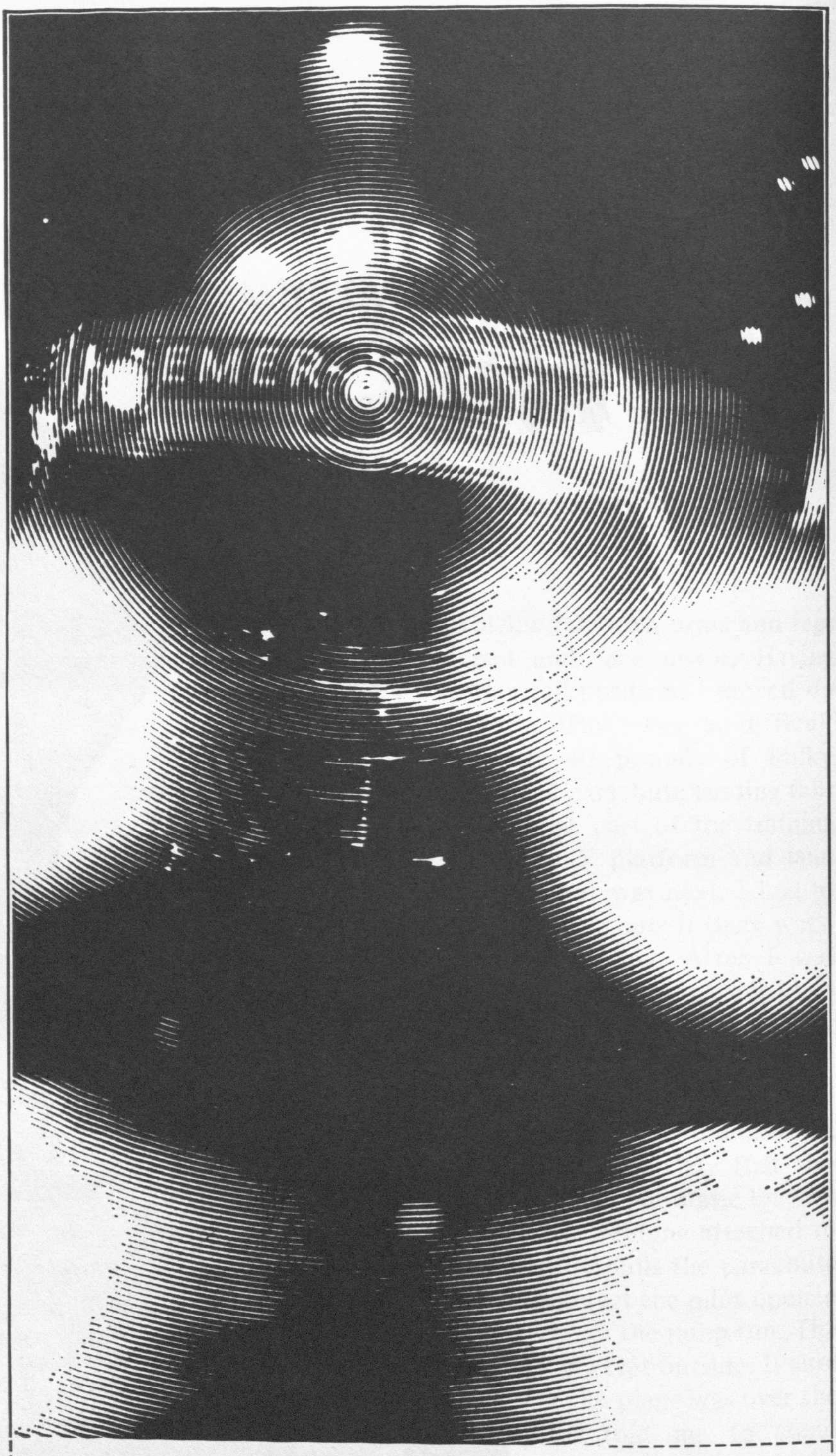

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PROFESSOR'S PROFILE

An interview with Dr. Donald J. Montgomery

by DAVID SNYDER

BACKGROUND: *Dr. Donald J. Montgomery spent his childhood in the small town of Erlanger in Kentucky. He attended a Jesuit high school where he obtained a classical education. He went on the University of Cincinnati for his degree in Chemical Engineering. He finished his graduate work at Cornell University and Cincinnati in theoretical physics. Dr. Montgomery is currently chairman in the Department of Metallurgy, Mechanics, and Material, Science and a professor in the Department of Physics.*

SPARTAN ENGINEER: Dr. Montgomery, you have two boys. What do you think of the *generation gap?*

DR. MONTGOMERY. There are gaps, but I don't think there are generation gaps as such. Perhaps there are cultural, economical, and educational gaps. It may depend on how one was brought up in his family. People of different generations do different things, but there need by no *opposition* as such. Each age does what is appropriate for it.

SPARTAN ENGINEER: An example of a cultural gap might be the change in philosophy in movie-making. In fact, sex and violence seem to be the trend in films as Hollywood continues to produce movies which many people feel should be censored. How do you look upon this subject compared to the cultural era you grew up in?

DR. MONTGOMERY: It's certainly different, but I can't get excited about it. I can remember when in *Gone With The Wind* Rhett Butler said "damn!" It was shocking to us, but we got used to it. (laughs)

SPARTAN ENGINEER: I understand you worked on a college engineering magazine staff.

DR. MONTGOMERY: Yes, I was editor of the *Cooperative Engineer* for the University of Cincinnati.

SPARTAN ENGINEER: How do you think it compares with today's engineering magazines? For example - *The Spartan Engineer.*

DR. MONTGOMERY: In 30 years things change. Your magazine is a bit more sophisticated than ours was. The particular articles I have seen in the *Spartan Engineer* don't have as high a technical content as those of earlier years, but the jokes are the same as they were in my time, and 30 years before me. It's nice to know there are some things you can count on. (smiles)

SPARTAN ENGINEER: The advancement of war has been blamed on the increased scientific achievements in society. What are your thoughts on this?

DR. MONTGOMERY: This is a complicated question. There is no doubt that an increase in technology gives you better control of your environment. How you want to use that control takes you outside the realm of science and technology.

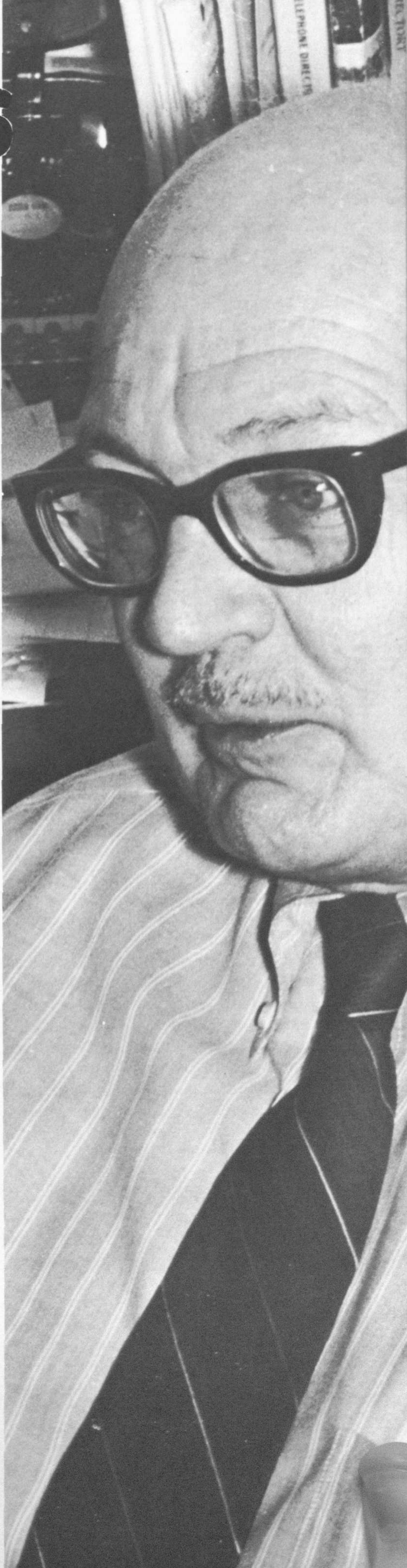
SPARTAN ENGINEER: Do you feel this is applicable to our present situation in Vietnam?

DR. MONTGOMERY: The war in Vietnam is only a remote consequence of the advance in technology. Vietnam is an example, but I would look to many other reasons for the war.

SPARTAN ENGINEER: Is there any one solution to this problem?

Dave Snyder is a freshman journalism major who recently joined the staff of this magazine. Here he gives Professor's Profile a different twist.

Continued on page 19



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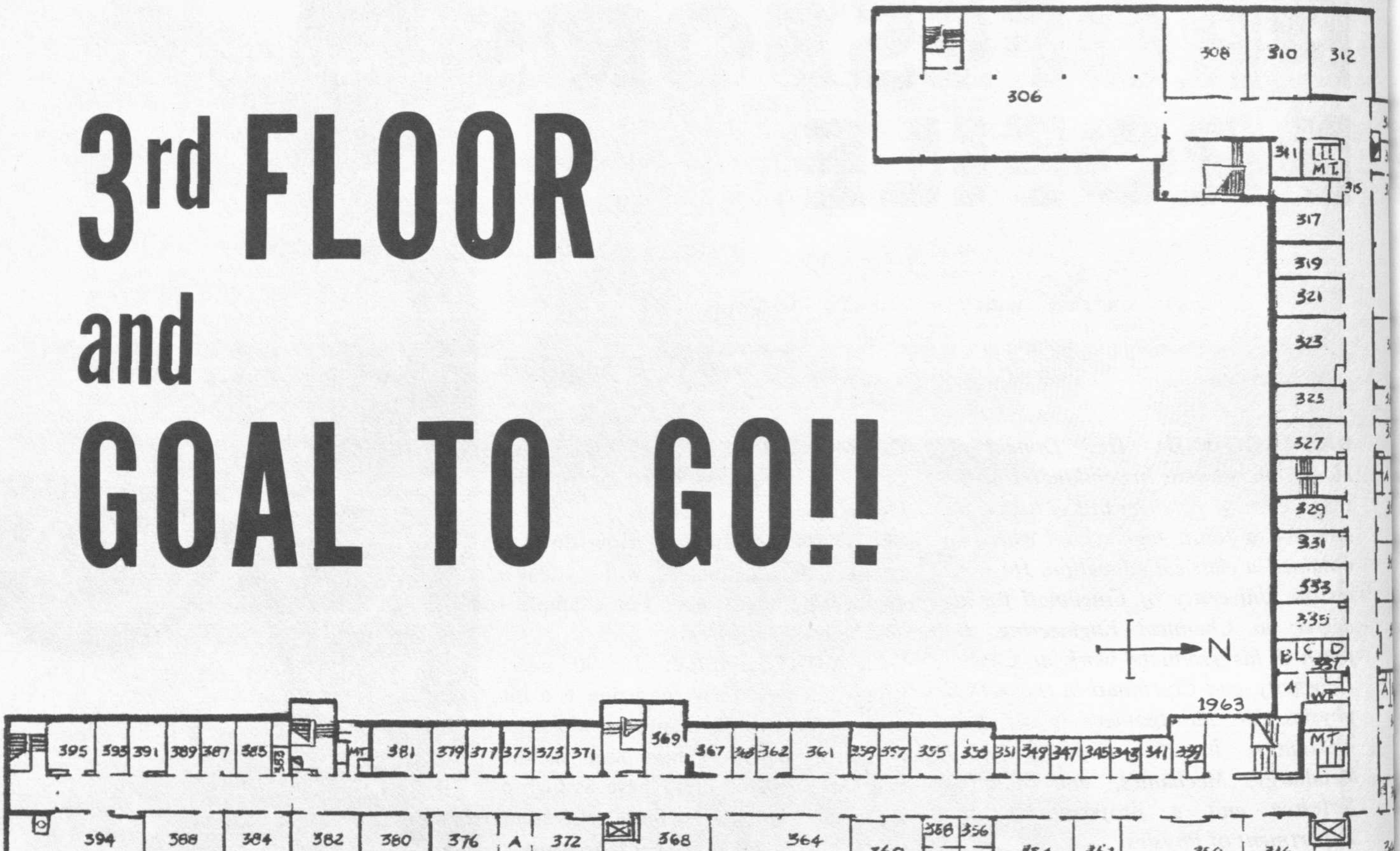
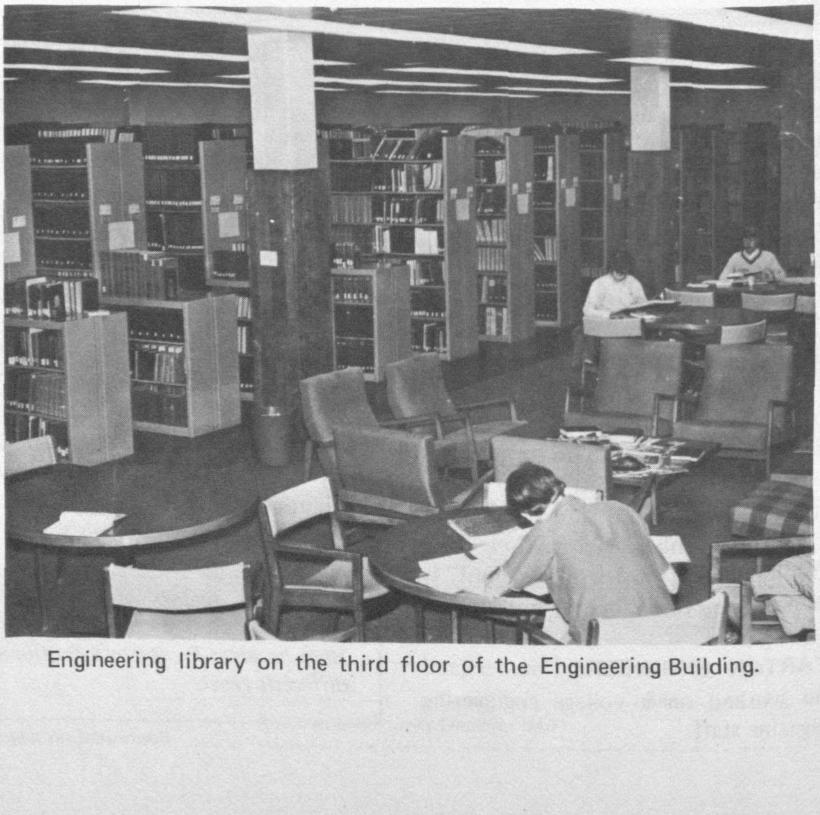


by PAUL KLEPPERT

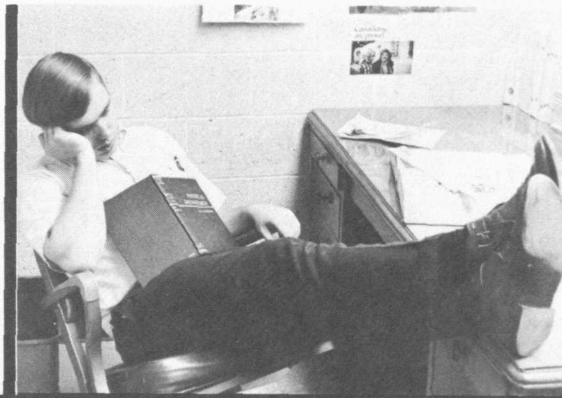
The third floor of the Engineering Building is brought to you by M^3 with technical assistance from E^2. Few engineers who are not of these two curriculums have found time to venture down these hallowed halls, unless lost or in search of the library. Those who have found the library were usually content to relax in its plush lounge, or study in its carefree atmosphere. Most upperclassmen know at least where the library is, but few could tell you who was responsible for its construction. Our library is named after its principle donor, Benjamin H. Anibal, *class of 1909,* and is furnished through the generosity of the engineering alumni. There are approximately 25,000 volumes and periodicals devoted to engineering subjects. These volumes have come from every major country and can be found in one of five different languages. If anything, the guy with the answers to last nights homework is probably up there now doing tonights.

Continued on page 26



Engineering library on the third floor of the Engineering Building.

ENGINEERS IN ACTION



by VINCE RYBICKI

AMATEUR RADIO CLUB

The A.R.C. holds meetings every Thursday at 7:30 in room 339 EB for those interested in radio experimentation and operation. The club station, W8SH, is available to licensed members of the club.

President: Ralph Taggart 355-5850.

INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS

The I.E.E.E. plans for a year of innovation. This year there will be three meetings per term which are geared towards all class levels and graduates as well as faculty.

I.E.E.E.'s future activities include: a microwave oven demonstration, Dr. Ryder in Russia, a past graduate to speak, a *kegger,* and field trips to; Abrams Corporation, power plant 65, the nuclear reactor, the computor laboratory, commercial broadcast transmitters, the cyclotron, and a visit to Wayne State University. The exact meeting times and places will be announced as the year progresses.

President: Bob Manion 351-5481.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

This fall term the A.I.CH.E. took a field trip to Alma where they toured the Leonard Refineries which includes some of the most modern equipment in the industry. Usually the A.I.CH.E. trips include two events in one and this was no exception for following the tour, the members attended a dinner speech by Mr. A. L. Conn (National president). Other past activities include a speech by Dr. G.A. Coulman on environmental engineering followed by refreshments and a trip to Dow in Midland followed by an afternoon of skiing. The next planned event is a trek to Strohs Brewry to be followed by a Piston basketball game.

President: David A. Smith 485-3187.

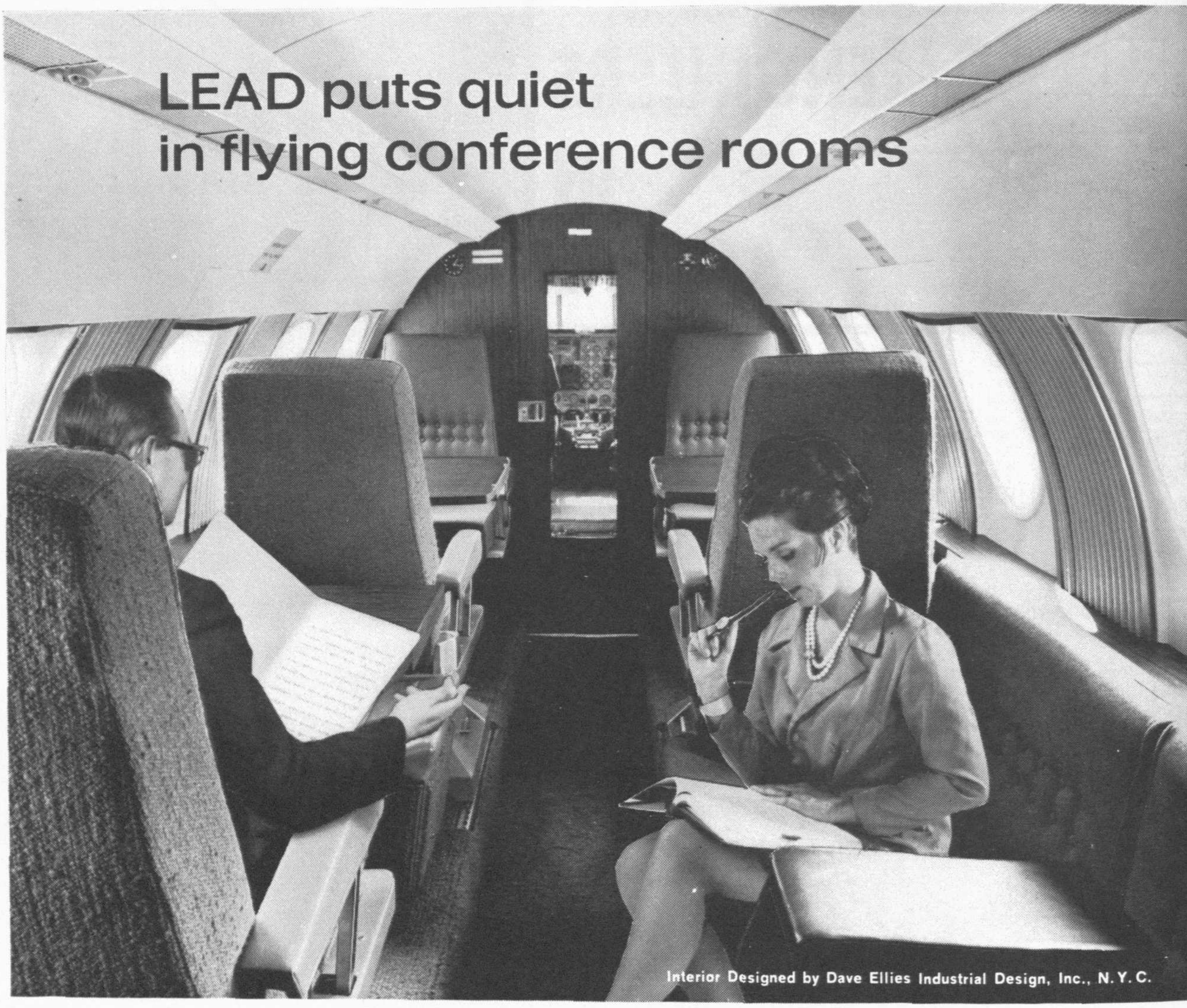
TRIANGLE

Triangle is planning on a term of social involvement with such activities as the *Engineering Experiment,* an attempt to find a means of decreasing the %50+ attrition rate in the college of engineering, the *Engineering Colloquim* which will include guest speakers covering all facets of engineering, and tutoring services available to all engineers and scientists. The tentative guest speakers Triangle plans to have throughout the term include; Dr. G. Van Doosen, Dr. Kerber, Dr. T. Triffit, Dr. Wilkinson, and Mr. Al Hoffman.

President: Dave Borzenski 332-0814.

Editor's note: All engineering organizations are welcome to contribute to the Spartan Engineer. Contact Vince Rybicki 332-3564, or Al Hoffman 210 EB.

LEAD puts quiet in flying conference rooms



Interior Designed by Dave Ellies Industrial Design, Inc., N.Y.C.

Even with two powerful fan jet engines only a few feet away, these people can converse in normal tones. How? The interior designers of this Fan Jet Falcon business aircraft specified a *lead impregnated vinyl* sheet to be sandwiched between the plane's outer skin and interior trim. Lead's density effectively bars both noise and vibration—makes flying more productive, more enjoyable. ☐ Lead alone, or combined with other materials, is one of our best weapons against noise pollution; it's being used in planes, boats, offices, schools and heavy machinery. Designers and architects know that "lead can make life more liveable—by hushing things up."

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CIVIL ENGINEERING

UNDERGRADUATE PROGRAM

INTRODUCTION

Civil engineering deals primarily with planning, designing, constructing and operating all those facilities essential to modern living. It provides society with such basic physical needs as shelter, transportation, water supply and pollution control. Therefore, the demand for Civil Engineers is one of the most stable among the professions. The Civil Engineering program at Michigan State University is based on three broad and interrelated areas – Civil Engineering Systems, Structures and Soil Mechanics, and Environmental Engineering. Each will be described briefly.

Civil Engineering Systems

The interaction of the many elements essential to the planning, design, construction, operation, and management of civil engineering projects is of major importance. These operations may be described in terms of systems which can be engineered for optimum functional modes. Recent developments in mathematical techniques, systems analysis, simulation, operations research, and computer methods make the synthesis of civil engineering systems a challenging new area of study and research.

Structure and Soil Mechanics

Many constructed facilities are composed of structures. These often are extensive, requiring a stable foundation and use of materials which perform for extended time periods under complex loads while exposed to the natural actions of the environment. Thus a fundamental understanding of the physics, chemistry, properties, structure, and behavior of construction materials and soils is basic to civil engineering. Structural design and soil mechanics coupled with modern analytical and design tools such as computers and models constitute another dimension of this profession.

Environmental Engineering

Advancing technology and expansion of our population have created an environment fraught with enormous problems of pollution. Its complexities encompass chemical, biological and physical phenomena as they apply to controlled engineering operations. These problems involve the Environmental Engineer, who provides for safe and ample water supplies; proper disposal of sewage and other wastes; the control of water, soil and atmospheric pollution; and sanitation of food and shelter.

DEGREE REQUIREMENTS

The first two years of Civil Engineering curriculum include general education and basic science areas that are generally required of all students in the College of Engineering. These are American Thought and Language; Social Science; Humanities; Health, Physical Education and Recreation; Chemistry; Elements of Computer Programming; Mathematics (through calculus and differential equations); and Physics. Course numbers are given in the curriculum.

The advanced requirements include Engineering Science, Civil Engineering basics, a Civil Engineering specialization group, and planned electives. The specialization courses are oriented towards one or more of the three areas – Civil Engineering Systems, Structures and Soil Mechanics, and Environmental Engineering. Available specialization courses are listed in the curriculum. The planned electives must be selected so as to provide breadth and/or depth to the student's overall educational program in Civil Engineering. Such electives may be chosen in other colleges of the university as well as engineering. A few examples of planned electives include:

Geology –
- GLG 306 Engineering Geology
- GLG 451 Structural Geology
- GLG 471 Photogrammetry
- GLG 474 Geophysical Methods

Management –
- EC 201 Introduction to Economics
- MGT 302 Organization and Administration
- AFA 315 Survey of Accounting Concepts
- AFA 391 Financial Management

Construction Engineering –
- EGR 263 Structural Drawing
- EC 305 Industrial Relations and Trade Unionism
- GLG 306 Engineering Geology
- BOA 326 Business Writing
- STT 351 Introduction to Statistics

For more information contact any of the Civil Engineering departmental advisors or write:

Chairman –
Civil Engineering Department
College of Engineering
Michigan State University
East Lansing, Michigan 48823

by PROFESSOR ANDERSLAND

impressions of engineeri

by "ZIGGY" KRZYWOBLOCKI

I wonder how many Americans really understand the academic rigor of the European Higher Educational System, especially in the area of engineering? For one must first understand the social structure of Europe and its culture before attempting to comprehend its educational uniqueness.

The European social structure, for many centuries, was based on the concept of class distinction. Although social conditions have changed considerably since the time of World War II, the present system is still based on class distinction. Education is still the most common way of elevation from one class to another.

Technological education in post-World War I Europe has three levels. On the first level we find the Vocational Schools, which are controlled by the government who must also approve all certification. Every certified mechanic must study a minimum of three years in an approved vocational training shop.

Level two consists of technical schools whose programs are comparable to undergraduate colleges in America. Eighteen year old European students who fail to be accepted by the University frequently find their way to these technical schools which have both day and night programs. Although these programs are strongly inclined towards practical applications of their acquired knowledge, there is still a marked emphasis on analytical understanding.

I hope the reader will permit me the luxury of digressing for a moment, so I can briefly relate some of my recent travel experiences.

One thing that struck me was that I noticed the alumni of these technical schools were the leaders of industry in each particular European country. They displayed a nice blend of practicality and theoretical understanding; more so than their counterparts in American industry. I think this is because Europe's industry is not set up for mass production to the extent that America is. Consequently, European industry must be prepared for more changes among their products.

To be admitted to a technical university a student must complete high school (called a *gymnasium* in Europe) and pass a set of final exams called *matura* meaning mature. The following September the student must pass a difficult entrance exam at the technical university. This test consists of material in mathematics, physics, perspective geometry and Marxism. Only a small percentage of the students can be accepted. Besides academic qualifications, the most important factor is one's family background and social class status. Children of workers, army officers, and government officials have priority. Old nobility and middle class *white collar* youth are passed by. This is a notable departure from the trend that prevailed prior to World War II.

Since high schools in Europe devote more time to general and humanistic subjects than we do here in America, European technical schools are concerned exclusively with technical subjects, economics being an exception along with a study of Marxism. The latter is taught every year in a different form.

From his first day at the university, the student concentrates on the core area of his field – a task that takes three years in subjects such as mathematics, physics, theoretical mechanics, synthetic geometry, and elements of design. This is followed by two years of specialization. At the end of his studies a student must write a final thesis consisting of either a design project, an analytical problem, or the construction of some experimental apparatus.

I have already touched on the first two levels of Europe's Technological Educational structure. Now I wish to speak of the third and final step that

education behind the iron curtain

Edited and revised by Dave Karrer

will earn the student the coveted title of *Master Engineer.* Namely, a final written and oral examination that consumes eight hours a day and lasts for a week or more. The student may be faced with a specialized design problem, or be asked to make calculations of a turbine part, etc. The tests differ from year to year and are always demanding. This is reflected in the fact that all final testing must be *closed book.*

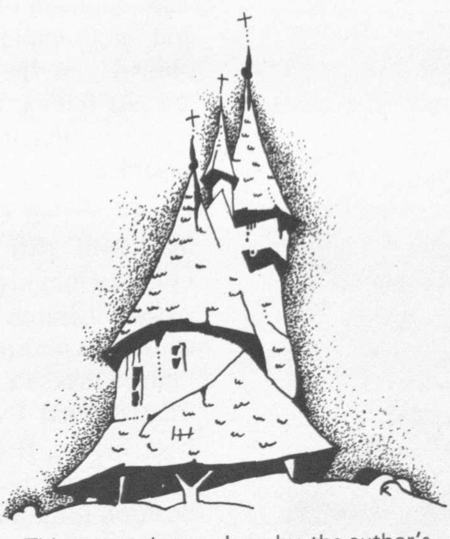
Three times each academic year a student must take an oral examination before the entire staff of the department. Such efforts from the student result in an automatic fellowship sponsored by the government for everyone in good standing. It may seem strange to American students to discover that their counterparts behind the Iron Curtain are forbidden to work. There is to be no priority conflict with academic excellence. Students who fall behind the school's requirements are ruthlessly discharged and automatically demoted to the workers' class.

Today one cannot imagine students rioting behind the Iron Curtain. When some rioting occurred in Polish universities a few years ago, they were quickly squashed by the police and the army. Any professors involved were discharged. Students landed in jail or mysteriously *vanished.*

In recent years an educational innovation has appeared – a four year engineering degree program with less specialization and no thesis requirement. This plan has the dual merits of reducing the length of time to graduate a student with fundamental training in engineering (and hence, entry into the skilled labor force), while allowing the interested and able student the opportunity to seek the more highly specialized *Master Engineer* degree.

During the summer months technological students receive practical experience with industrial companies. It is not unusual for such students to spend the first month sweeping floors. Supposedly, to become thoroughly acquainted with the floorplans of the building and the location of resources. All such student assignments are regulated and enforced by government authorities.

What happens to students who graduate with a *Master Engineer's* degree? The majority enter industries



This art work was done by the author's brother who lives behind the Iron Curtain.

designated by governmental authorities. The rest continue with advanced studies which take the form of institutes organized by the government, and which are controlled by the Academy of Sciences.

A Doctoral candidate begins as a laboratory assistant, but does not accept any teaching responsibilities. His course work is conducted exclusively by professors. However, due to lack of certain experimental equipment, advanced studies often concentrate on analytical content.

To earn a Doctor of Science degree usually takes from five to six years. It is not unusual for a candidate to publish his supervised thesis work before obtaining the Doctor's Degree.

Having obtained the D. Sc. Degree does not authorize the person to teach in the University. He can only teach in medium technical schools or consider *habilitation.* The latter consists of an independent research thesis and an hour long presentation of his findings to the faculty institute. It should be noted that the strict oral examination always contains the theory of Marxism.

Upon completion of the *habilitation,* the candidate earns the title *Dozent Habilitated* (Doz. Habil). Only doctoral candidates with this special title can be promoted to the two highest academic ranks of Extraordinary Professor and Full (ordinary) Professor.

In case you are curious, most candidates earn the Dozent Degree at about age forty.

I would like to close this article with a few remarks about the role of women at the technical universities. In general, women behind the Iron Curtain tend to be superior to their academic counterpart in the U.S. In fact, they appear to be even superior to their male competitors in the U.S.S.R. These women want to supplement their husband's income and are serious students. They are very stable and task oriented. To complement their efforts the government provides nursing homes for small children, elementary pre-schools, etc.

In brief, it is safe to say there is no academic discrimination against women competing for advanced studies.

What amazed me during my recent trip to Poland, Roumania, etc., were the number of women about age thirty who had earned a D. Sc. Degree and were working on moving from *habilitation* to the highest academic ranks. Despite their deep knowledge these women had not lost their feminine charm or attractiveness. □

SKYDIVING *Continued from page 6*

and himself as close to a six inch disk as possible. The disk is in a large circle of pea gravel so that when a jumper makes a competition landing he will not get hurt. Another type of competition is called turning style. This takes much more practice than accuracy. The object of turning style is to complete an international series, 360° right turn, 360° left turn, back loop, right turn, left turn and back loop during free fall in as short a time as possible. The jumper always keeps track of his altitude because at 2,500 feet he should pull his ripcord. Most big meets consist of competition in both style and accuracy.

Another aspect of skydiving is called relative work. In free fall a jumper can control his forward and backward speed as well as his rate of descent. With a certain proficiency in these areas, two or more jumpers exit the plane en masse from a sufficiently high altitude so that they can *hook up* with each other separate and get away safely to open their parachutes. When many jumpers exit together each must know the others positions to make sure, they don't accidentally collide. The desired result is a *star* where many jumpers hook up together. The largest *star* so far is a 21 man *star* which was achieved in California from about 13,000 feet. Relative work jumps are the most fun. The sensation of seeing someone float over to you and grab ahold of you is indescribable. To an observer on the ground it looks like the jumpers are just falling, but to the jumpers after they reach terminal velocity, it looks like they are floating together.

After two or three hundred jumps a person may think that you would get tired of the sport, but each jump is so unique that it's never a routine. After 80 jumps I made my first unstable free fall which was also interesting. Many times when a jumper makes a back loop he will roll on his back. That is what I did, but I had never been on my back before. It was a strange sensation to not to be able to see the earth, so I decided to fall in that position for a few thousand feet. Many jumpers fall in this position frequently, but not intentionally. This is called zapping. Jumpers get reputations for being good at various things like style, accuracy, or relative work; however, some members of the MSU Club have reputations for other things. e.g. most times landing in trees, landing in water or power lines, and most malfunctions.

It is hard to describe skydiving completely. To know what this sport really is, a person must try it for himself and make his own conclusions. I did and decided that it is the greatest sport yet. □

PROFESSOR . . . *Continued from page 9*

DR. MONTGOMERY: Not having studied the subject thoroughly enough to know all the complications involved, I feel there is one thing that we must accept first. We need to realize that it is not feasible for us to impose a system of government, which may not be appropriate, on a civilization in a different stage of development. We have had pretty good evidence of this for the past 10 years.

SPARTAN ENGINEER: Religion and science have locked horns over many subjects. How has this affected you?

DR. MONTGOMERY: I don't think many people are intensely concerned with this anymore. I think it's pretty well accepted that one can neither prove or disprove the existence of a God. If religion helps a person, then he should embrace it. If he doesn't find need for it, I don't think it should be forced upon him. I spent some time on this in high school. I got kicked out of religion class for studying chemistry books behind my religion book, and I got kicked out of my chemistry class for studying apologetics behind my chemistry book.

SPARTAN ENGINEER: In the field of engineering, do you think there should be more emphasis toward specialized training than a broad educational background?

DR. MONTGOMERY: No, you want to find a guy who can do two things. His mind has to be good enough to handle the mathematics. At the same time he has to be interested in engineering. Anyone who has graduated and worked knows that the chance of using the specifics of most of what he has learned is almost negligible. You can't possibily train people in detail for what they're going to do in later life, because nobody knows. You have to try to train people for a lifetime, not just a week. Since we don't know what they will be doing for a lifetime, we can only provide a basic knowledge that will serve as a basis for a wide variety of things.

SPARTAN ENGINEER: The job market is becoming so tight that it has created a noose for students. What advice could you offer to those people who will be hunting for jobs in the near future?

DR. MONTGOMERY: I have a couple of comments. There's obviously something pretty nutty about our way of doing things. We manage to keep people unemployed when there are a great number of unsatisfied human needs. I don't think this is as evident in Germany or Japan, or for that matter, in most of Europe. Secondly, a student's expectations are so great, that much disappointment results. In my day we didn't expect anything, so when we didn't get anything we weren't so disappointed. As far as advice is concerned, I have this to say: Look upon this investment of education principly as a development of your abilities, and apply it to your satisfaction of life rather than looking at it as just a meal ticket. Nonetheless, we do have to eat.

SPARTAN ENGINEER: What do you consider the most important aspect of teaching?

DR. MONTGOMERY: The most important thing is not to be sarcastic or embarrass a student; that shuts off the feedback from the other students.

Phone rings.

Hello . . . Pause . . . *Yes* . . . Pause . . . *Yes* . . .

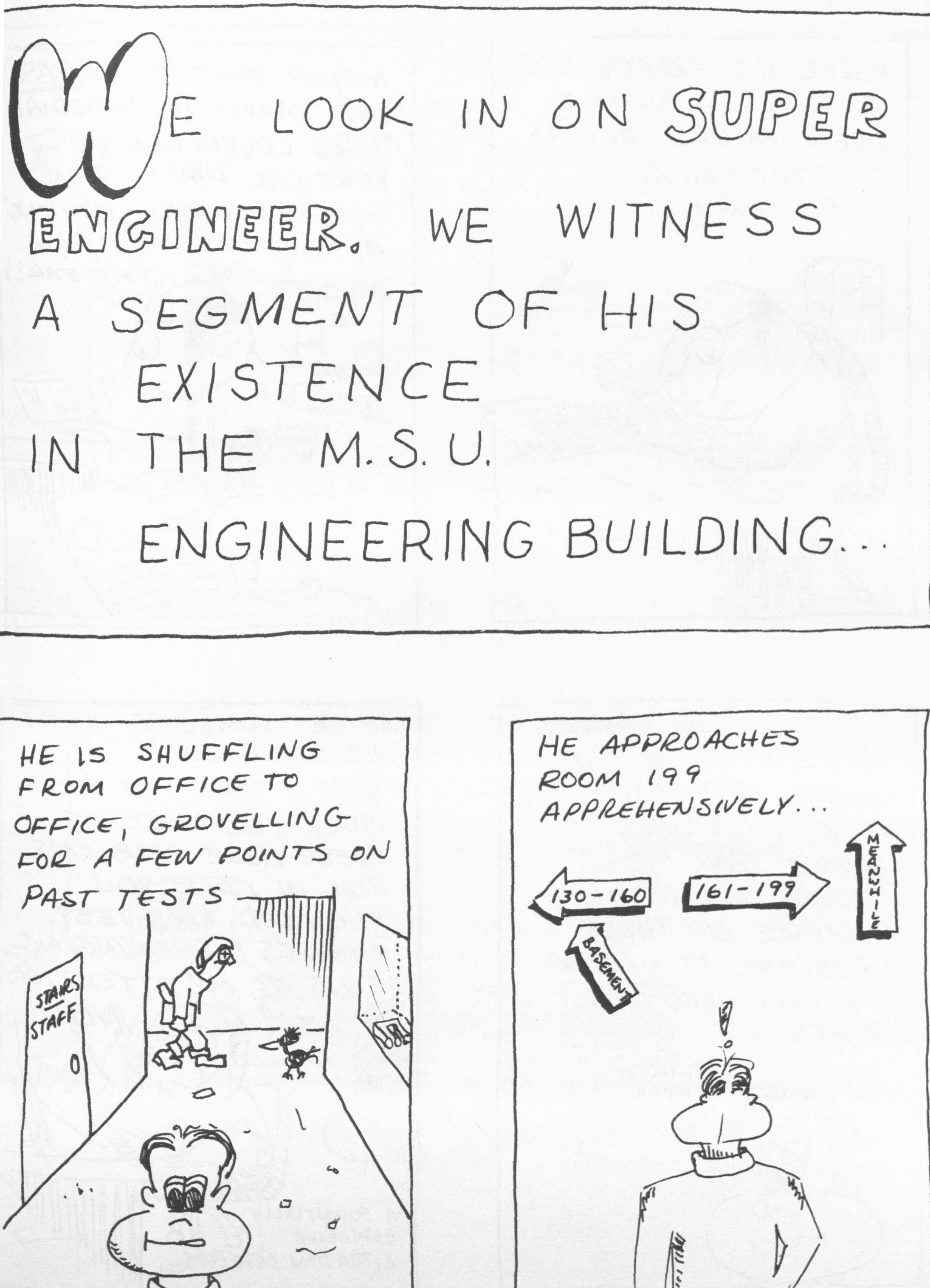
Pause . . . *There's not much I can do* . . .

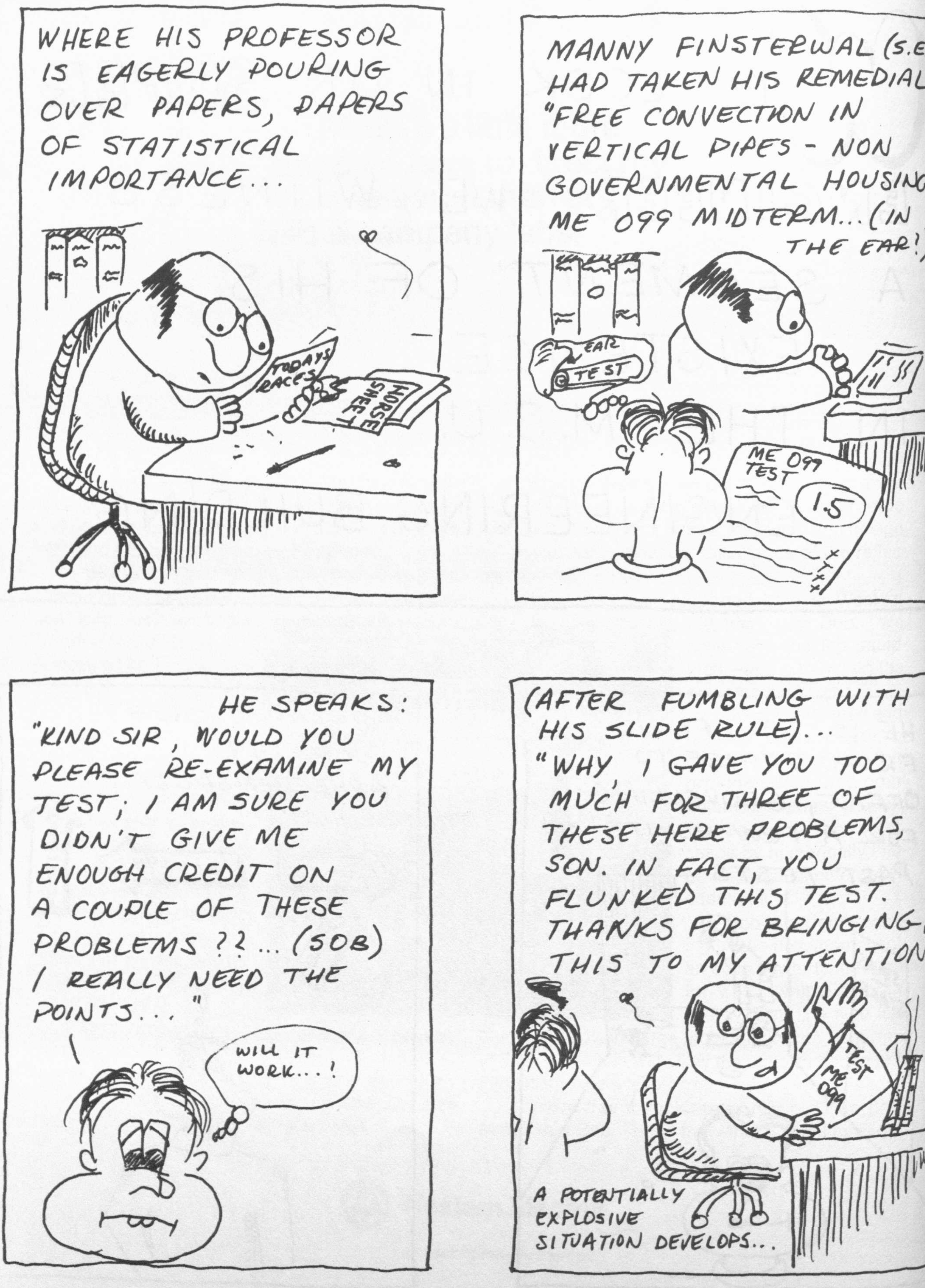
Pause . . . *That's right Court seven.*

Hangs up.

Then Dr. Montgomery turns to me and says, "That was my handball partner." (nervous laugh)

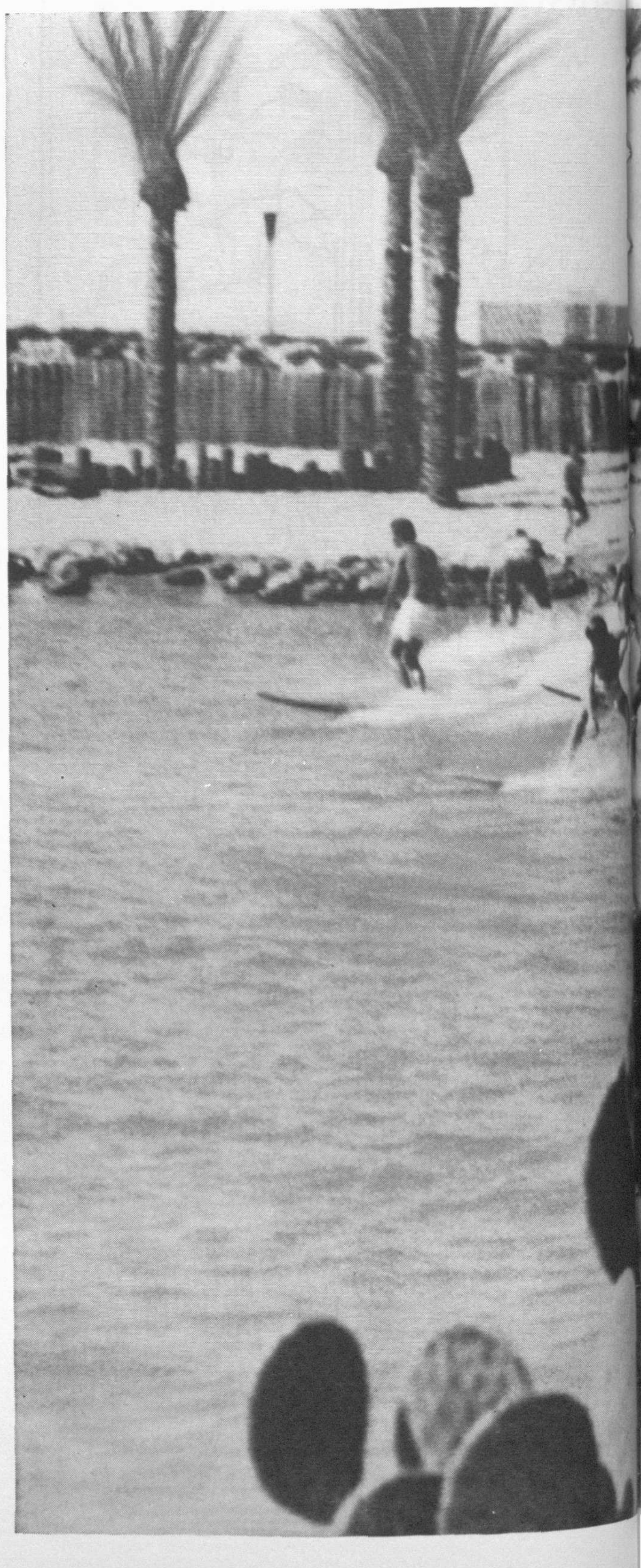
I was embarrassed. The interview ended. □


WE LOOK IN ON SUPER ENGINEER. WE WITNESS A SEGMENT OF HIS EXISTENCE IN THE M.S.U. ENGINEERING BUILDING...
HE IS SHUFFLING FROM OFFICE TO OFFICE, GROVELLING FOR A FEW POINTS ON PAST TESTS
STAIRS
STAFF
HE APPROACHES ROOM 199 APPREHENSIVELY...
130-160
161-199
MEANWHILE
BASEMENT


WHERE HIS PROFESSOR IS EAGERLY POURING OVER PAPERS, PAPERS OF STATISTICAL IMPORTANCE...
TODAYS RACES
HORSE SHEET
MANNY FINSTERWAL (S.E.) HAD TAKEN HIS REMEDIAL "FREE CONVECTION IN VERTICAL PIPES - NON GOVERNMENTAL HOUSING" ME 099 MIDTERM... (IN THE EAR!)
EAR TEST
ME 099 TEST
15
HE SPEAKS:
"KIND SIR, WOULD YOU PLEASE RE-EXAMINE MY TEST; I AM SURE YOU DIDN'T GIVE ME ENOUGH CREDIT ON A COUPLE OF THESE PROBLEMS ?? ... (SOB) I REALLY NEED THE POINTS... "
WILL IT WORK...!
(AFTER FUMBLING WITH HIS SLIDE RULE)...
"WHY, I GAVE YOU TOO MUCH FOR THREE OF THESE HERE PROBLEMS, SON. IN FACT, YOU FLUNKED THIS TEST. THANKS FOR BRINGING THIS TO MY ATTENTION"
TEST ME 099
A POTENTIALLY EXPLOSIVE SITUATION DEVELOPS...


QUICKLY...
PHHHIT
WOMEN STAFF
UGHHH!
CLUNK!
SHPIIFF...
ACTING SWIFTLY...
ZORCH
SE
RIBIT
RIBIT
I GUARENTEE HE'LL NOT INTIMIDATE THE UNSUSPECTING ANY MORE... NOW BACK TO THE BOOKS...
SE
RIBIT RIBIT

They're "shooting the curl" in Phoenix.



3rd FLOOR . . . *Continued from page 10*

To those who have never found the time or had the interest to follow a pretty pair of legs a flight of stairs up ahead, or to those who never had the opportunity to climb three flights of stairs for a class, and especially to those of you who took EE 345 and swore they would never set foot up there again, please, allow me to speak on behalf of those who spend their days striving for excellence on this little known, seldom understood floor.

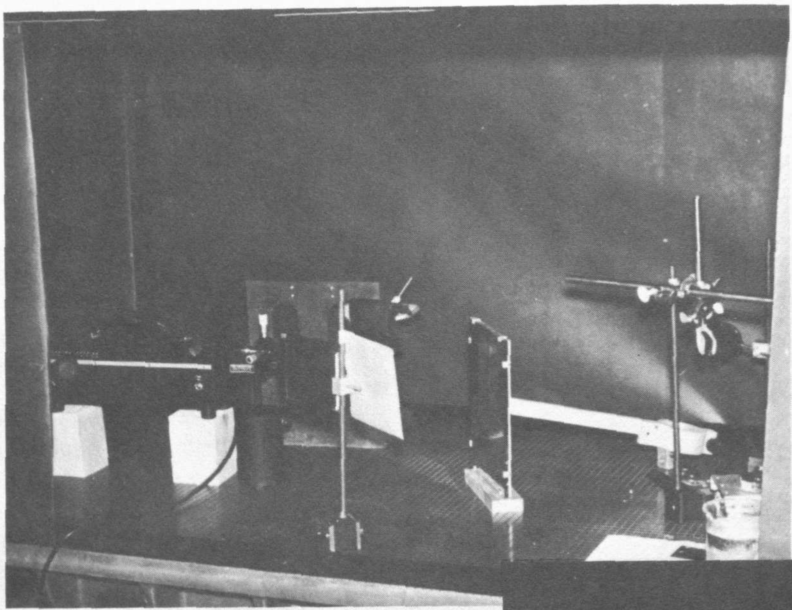
First, may it be said that some of the nicest, most helpful profs reside on this floor. Many of their efforts and accomplishments go unnoticed simply because of location. Dr. Mase has just had a Schaum's outline published in *Continuum Mechanics,* a much needed addition to this field.

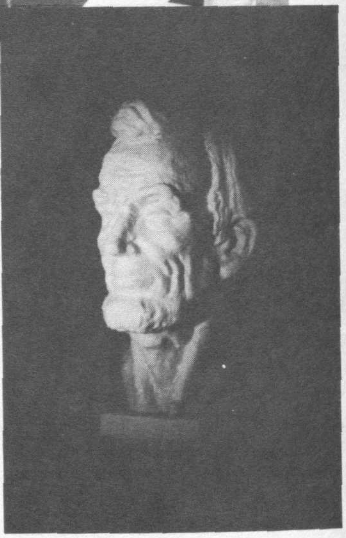
Dr. Montgomery, Dean of M^3 has worked hard to provide many important areas of research and undergraduate study opportunities within the third floor walls.

Dr. Little of M^3 is now coordinating a program with Vet Medicine and Physiology in establishing a Bio-mechanics lab in Room 317. This new lab is already being set up for two important projects.

One is concerned with developing a material and a process for installing new ligaments in the knee. It is hoped that through testing of various materials one can be developed that will show the same stress, strain characteristics under similar load conditions. Should this material be developed it will then be necessary to develop proper surgical methods for installation and securement. Also stress, strain tests are being run on broken bones that have been healed by different methods. Bad breaks are usually set with either pins, plates or a circular clamp process. It is hoped that the best method of healing will be determined. Good luck, Dr. Little!

Professor Sharpe of M^3 is now doing work with holograms. These are three dimensional images created by laser beams on a photographic plate. The experimental apparatus is in Room 324 as shown in the picture. The insert in the lower left hand corner is a hologram of Abraham Lincoln. Dr. Sharpe has also developed a method for measuring strain rates of high velocity impacts. By etching two lines .005" apart and using laser beams it is possible to record any change in separation of these lines when hit by an object traveling up to 1000 ft/sec. In Room 331 students are working on growing single large crystals in order to study singular crystalline properties that are impossible to isolate in their natural existance. Working in conjunction with the students is Professor Subramanian, who specializes in the operation and use of the electron microscope found in Room 337.





Dr. Sharpe's hologram experiment. Laser is at left. Image is seen through photographic plate in center foreground.

This microscope (which was made in Japan) is capable of magnifying an object one million times. It can distinguish particles as close as 7 angstroms apart. Its operating range is from 50 to 100 KV and usually can operate up to 20 hours on a single filament. There is an undergraduate course given by M^3 in the use of this tremendous piece of equipment, so consult your local schedule book for time and location.

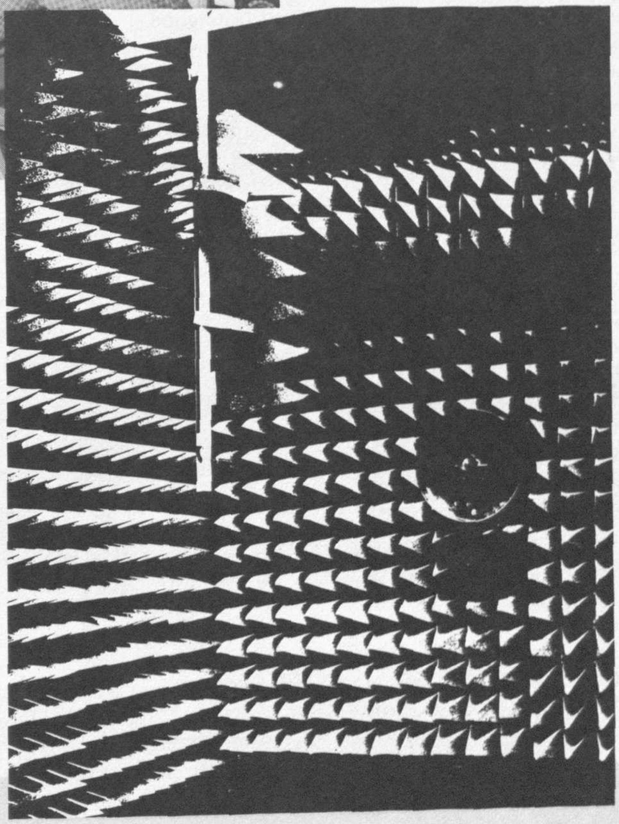
The greatest problem in using the scope is the preparation of samples. Many countless hours are spent in Room 335 achieving a thin enough sample to use in the microscope. Great care must be taken to achieve satisfactory results.

Students also can take a course in X-ray diffraction of material structures. The lab is in Room 338. Surface X-rays can be taken from a polished and etched sample which will reveal the basic contents of the sample as well as its structure.

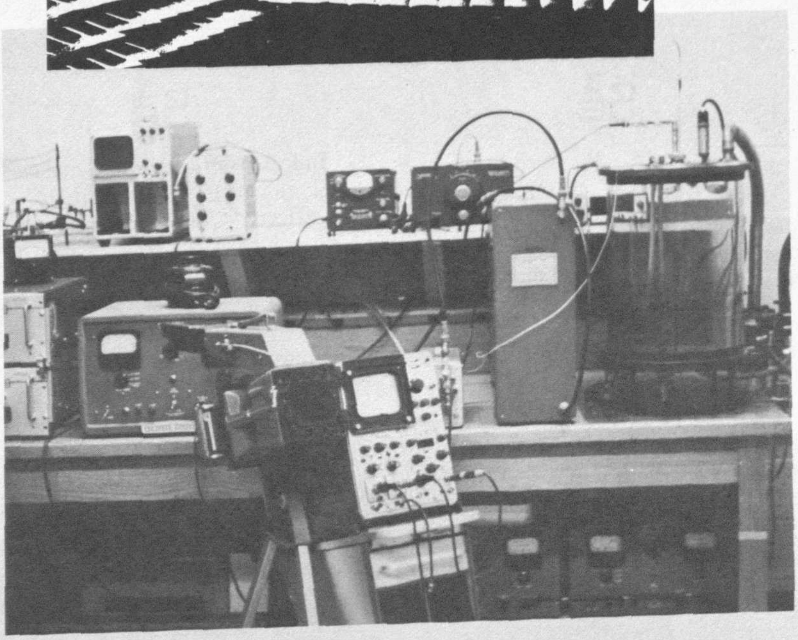
Many of us have spent time in Rooms 340, 344, and 346 doing our M^3 370 labs. Here samples are polished and prepared for the X-ray lab as well as for photographic work with smaller microscopes.

As we turn the corner and head south we smell the fragrance of ozone. This is E^2 country. W8SH radio station operates out of Room 339. The large antennae that fell off the roof last year belongs to them (I hope the C.E.'s put it up this time). Al Francisco has his heart there as president of this operation. Any engineer who has a flare for electronics is more than welcome to stop in and check out the place and its equipment. Moving down the hall, the sound of static can be heard coming from many of the

Al Francisco at helm of W8SH radio station.



Radio antenna experiment. Circular disc is sending antenna. Suspended from ceiling on left is 180° receiving antenna.



Ionized gas experiment in Plazma Lab. On right is chamber containing ionized gas.

offices, (pun intended), as well as the undergraduate EE labs on the left.

In Room 367 is the electronics repair shop run by Don L. Allen and I. E. Sanislo. Take some advice and save yourself a lot of time and trouble the next time your stereo goes kapow at a party, stop in and see them. Their information won't cost you anything and if they are not too busy they might even be able to explain to you what the problem seems to be.

Farther down is Room 372 and 376 where two graduate students are conducting separate but related experiments. In the plasma lab they are attempting to discover and isolate experimentally waves that have been deduced theoretically in ionized gases. The application for this is so that radio communication can be maintained with a re-entering space vehicle. Presently there exists a communication black-out as a space craft passes through the ionisphere.

In the next room is an experimental sound chamber where various types of antennae are being tested. The one picture is a circular concave antenna that, so far, is able to work as well if not better than elaborate systems currently in use in many space vehicles. If perfected it would be a great space and weight saver because of its simplicity.

With this we conclude our tour of the third floor, and hope those of you who haven't been up there will take the time soon and browse around. I know the folks up there will be proud to show you around. □

ENGRINEERS

M.E.: "I must have the pickiest math prof in the world."

C.E.: "Why do you think so?"

M.E.: "On the last test that I got back, he took off 3 points for having the decimal point upside down."

Annoyed by the professor of anatomy who told racy stories during class, a group of coeds decided that the next time he started to tell one that they would all rise and leave the room in protest. The professor, however, got wind of their scheme just before class the following day, so he bided his time; then, halfway through the lecture he began. "They say there is quite a shortage of prostitutes in France . . ."

The girls looked at one another, arose, and started toward the door.

"Young ladies," said the professor with a broad smile, "the next plane doesn't leave until tomorrow morning."

Over 100,000 accidents happen in the home every year. Join planned parenthood!

A Civil Engr. had managed to get his car stuck in the mud and was trying to dig it out with a shovel.

"Stuck in the mud?" queried a passing motorist.

"No, I'm not stuck. My car died, and I'm burying it," replied the irate engineer.

For Chem. E.'s: We've often heard it said that gasoline and alcohol don't mix. Actually, they mix, but they just don't taste good.

"Wanna sell that horse?"

"Sure I wanna sell the horse," the farmer replied.

"Can he run?"

"Are you serious? Watch."

The farmer reached over and slapped the horse on his posterior and the animal went galloping away. As the horse reached full speed, he ran smack into a tree.

"Is he blind?" the buyer gulped.

"Hell no," the farmer said easily, "he just don't give a damn."

Engineer on telephone: "Doctor, come quick! My little boy just swallowed my slide rule."

Doctor: "Good heavens, man, I will be right there. What are you doing in the meantime?"

Engineer: "Using log tables."

Judge: "Officer, what makes you think this M.E. is intoxicated?"

Officer: "Well, Judge, I didn't bother him when he staggered down the street or when he fell flat on his face, but when he put a nickel in the mailbox and said, 'My God, I've lost 14 pounds!' I brought him in."

Aerospace Engineers are continually surprised to find that girls with the most streamlined shapes offer the most resistance.

Sleeping in the upper berth of the comfortable train, the old gentleman was awakened by a continuous tap from below.

"Mr. Patterson, are you awake?" asked the lovely lady in the berth below.

"I am now," came the groggy reply.

"It's terribly cold down here, Mr. Patterson," said the teasingly tantalizing voice of the young girl. "I wonder if you would mind getting me a blanket."

I've got a better idea," he said. "Let's pretend we're married." He could hear the soft sound of her giggle. "That sounds like a marvelous idea," she cooed.

"Good," he replied, rolling over, "go and get your own damn blanket!"

"But, mother, none of the other fellas have to wear high heeled shoes"

"Shut up, for heaven's sake! We're almost at the draft board."

Two drunks wandered into a zoo and as they staggered past a lions cage, the king of beasts let out a terrific roar.

"C'mon, let's get out of here," said the first.

"You go ahead if you want to," replied his more inebriated cohort.

"I'm gonna stay for the movie!"

Chemistry Professor: "Young man, why aren't you taking notes?"

Student: "I don't have to, Sir, I've got my grandfather's.

On your way up in engineering, please take the world with you.

The best engineers are far from happy with the world the way it is.

The way it is, kids choke on polluted air. Streets are jammed by cars with no place to go. Lakes and rivers are a common dumping ground for debris of all kinds.

But that's not the way it has to be.

Air pollution can be controlled. Better transportation systems can be devised. There can be an almost unlimited supply of clean water.

The key is technology. Technology and the engineers who can make it work.

Engineers at General Electric are already working on these problems. And on other problems that need to be solved. Disease. Hunger in the world. Crime in the streets.

General Electric engineers don't look for overnight solutions. Because there aren't any. But with their training and with their imagination, they're making steady progress.

Maybe you'd like to help. Are you the kind of engineer who can grow in his job to make major contributions? The kind of engineer who can look beyond his immediate horizons? Who can look at what's wrong with the world and see ways to correct it?

If you are, General Electric needs you. The world needs you.