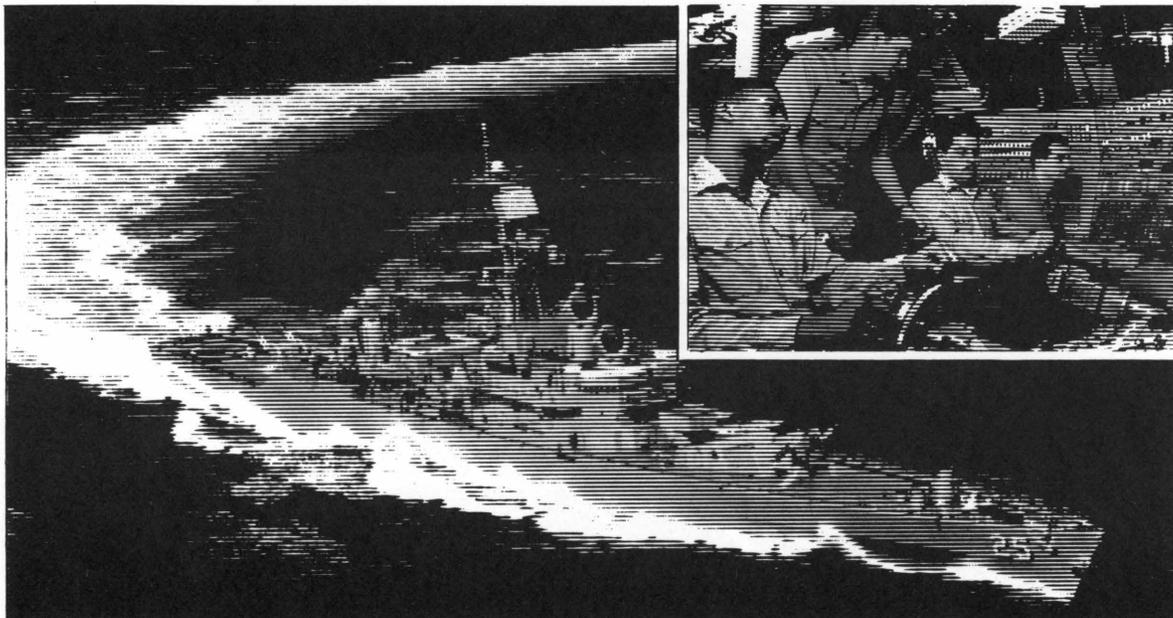


Engineers' Forum

VIRGINIA TECH SEPTEMBER 1990

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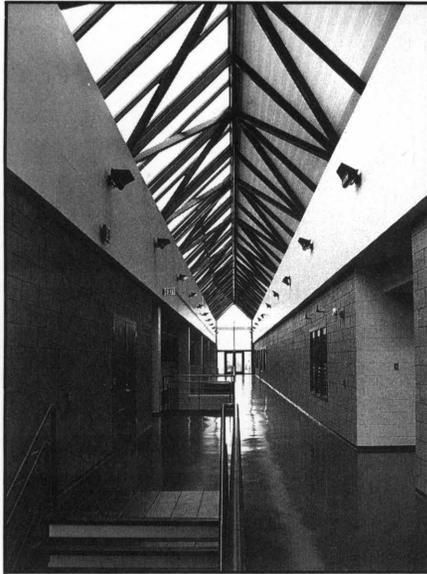
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ON THE COVER

The unique half-glass, half-shingled atrium inside the new engineering/architecture building is just one of the many modern conveniences this facility offers. Photo by Scott Dau.

Engineers' Forum is Virginia Tech's student engineering magazine. *Engineers' Forum* magazine is published four times during the academic year. The editorial and business office is located at 112 Femoyer Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061. Phone (703) 231-7738. Member of Engineering College Magazines Associated, Lee Edson, Chairperson.

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EDITOR'S PAGE

WELCOME BACK!

Time for the Same Old Same Old, Right?

As some already know, the editor-in-chief of the *Engineers' Forum* for the past two years, Andy Stalder, graduated with a B.S in Mechanical Engineering last spring. At this time, I would like to introduce myself, as I have taken over the position of editor-in-chief. Majoring in Industrial Engineering and Operations Research, I am a junior. Throughout, the past year and a half of college, I have been involved with the magazine, dealing with areas including writing, production, advertising and editing.

The past year saw many changes for the magazine. Most significantly, the method of production has changed from the old cut and paste method to the use of a large computer system run by our phototypesetting specialist and design consultant David Simpkins.

The future looks promising for the *Engineers' Forum* as we have managed to keep ourselves in the "black" financially. It is the staffs' hope that the publication will be able to return to a color cover in the near future.

Enough history and speculation about the magazine. Another start of the traditional school year is upon us and the summer sounds of the ocean breaking against the shoreline will soon give way to frantic number crunching of calculators. Some of you know this feeling all too well, especially the seniors.

As for the freshman engineering students, don't let anyone panic you with some horror story, however give upperclassmens' advice some consideration. There is no doubt this will be a difficult and exciting year for many, however do not let it overwhelm you.

Classes are certainly important, though there is much more to college life. For instance, there are many professional societies and other engineering organizations such as the *Engineers' Forum* that are always looking for members. Another organization which does not deal with a specific discipline inside the Engineering School, rather, it deals with the overall realm of the College of Engineering, is the Student Engineers' Council. All freshman engineering students should look for bulletins concerning organizations of this type and give it a try. Who knows, you might like it!

Now, all upperclassmen, that missed out your freshman year, it's never too late to get involved. Remember, the more you put into the college experience the more you will get out of it. Why not support your profession while you are mastering it? Isn't it time you got away from the "same old same old" routine and start exploring what the College of Engineering has to offer outside of the classroom?

Jonathan S. Hess

Jonathan S. Hess, Editor

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by CHAD DENNIS

September 17, 1990
12:00 noon to 5:00 p.m.
September 18, 1990
9:00 a.m. to 4:00 p.m.

in the
War Memorial Gymnasium

By now, most students have probably seen countless posters, buttons, and balloons exclaiming, "EXPO '90." This may not mean much to an education or business major; however, it means interviews and company interaction for all engineering students.

EXPO '90 is Virginia Tech's eleventh annual engineering exposition, featuring company information, display booths, and a program of technical presentations by participating companies.

EXPO was started in 1979, by the Student Engineers' Council (SEC) of Virginia Tech. Then, the exposition consisted of forty to fifty companies which attracted primarily senior engineering students who were searching for jobs. Today, the exposition has grown to a showcase of over 120 companies and government agencies, attracting not only seniors, but juniors, sophomores, and freshmen as well.

Participating companies as familiar as IBM and Dow Chemical, and government agencies as large as Newport News Shipbuilding, will be visiting Virginia Tech for EXPO '90.

EXPO '90 will be held in the War Memorial Gymnasium from 12:00 noon to 5:00 p.m. on Monday, Sept. 17 and from 9:00 a.m. to 4:00 p.m. on Tuesday, Sept. 18.

Previous EXPOs have featured models, company video tapes, and souvenirs in addition to the company booths. EXPO '90 also features technical presentations given in Owens Banquet Hall. The technical presentations, presented by companies, describe a new product, a technical advancement, or continuing research. These presentations open company doors to student engineers, revealing prevailing research and technologies.

EXPO '90 provides engineers with a chance to research and interact with companies. However, EXPO '90 is more than a career fair, it is a "technology showcase."



Films

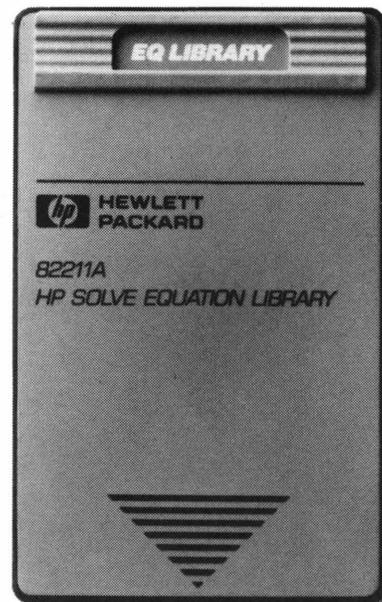
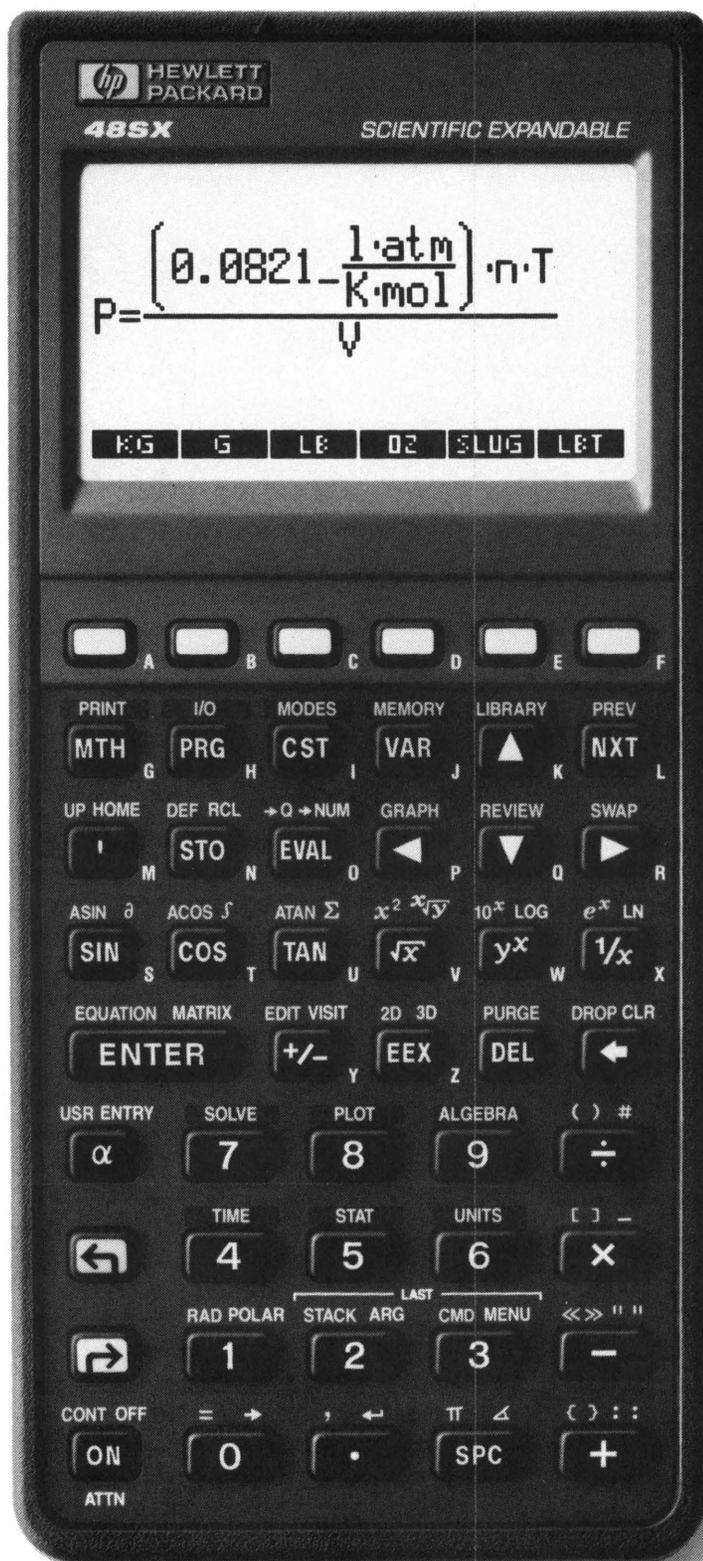
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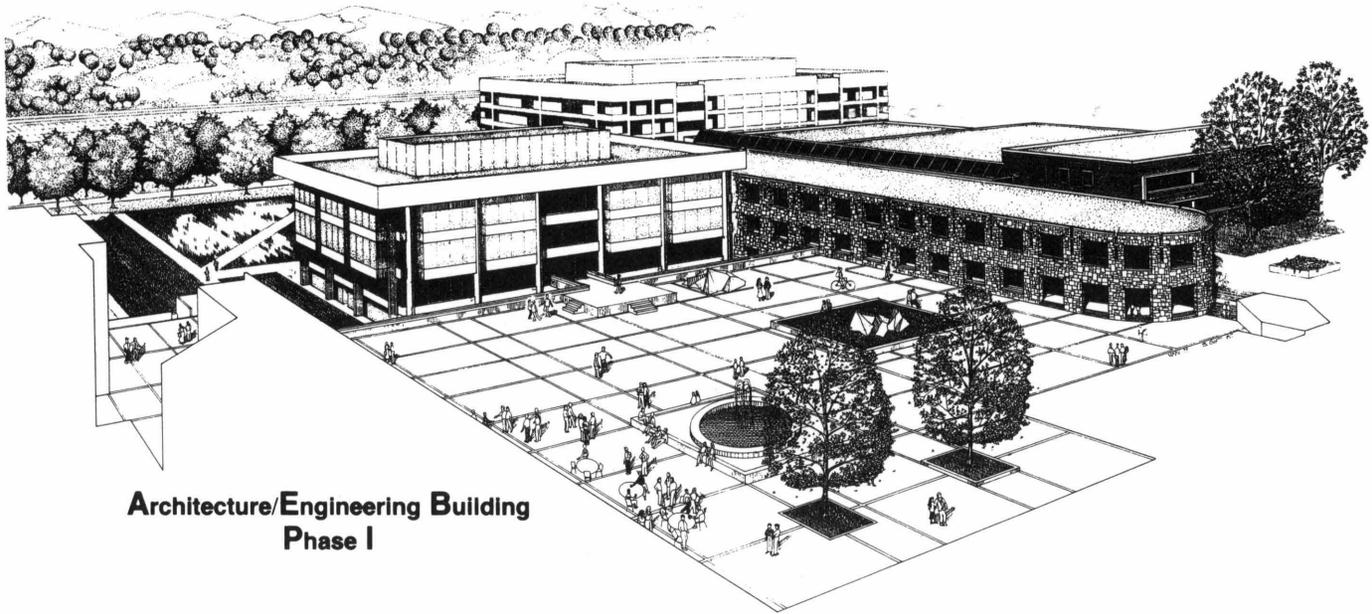
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**Architecture/Engineering Building
Phase I**

Research Facility Is Now A Reality

by ROBIN ELDER

In March of 1988, with a total cost of over 9.1 million dollars, the land between Randolph and Cowgill Hall was fenced off as the digging began for the new engineering and architecture annexation building. Thus began the creation of Hancock Hall, named after John W. Hancock, Jr. who helped to fund it.

The new building is equipped with many modern conveniences like the hydraulically powered elevator, designed to transport sensitive equipment smoothly while being large enough to fit a forklift.

Instead of the little round fire alarms visible in most of the engineering buildings, Hancock has its smoke detectors hidden in the duct work. The fire alarm flashes a strobe light while announcing a pre-programmed message, something like "Alert Alert, emergency conditions exist! Please exit the building immediately!!"

The Architecture Auditorium, shared by the College of Architecture and Urban Studies and the College of Engineering is a "state of the art facility."

Explained Joseph Price-O'Brien, the operations manager of the Materials Research Section of Hancock Hall, "They've got all kinds of modern facilities: a big projection booth, 350 seats, a curved screen, a nice speaker system — everything you could ever want."

Upon examination of the large steep-

"In addition to the modern conveniences, Hancock Hall also caters to a long held complaint of this university: the lack of space.

ly sloped room, one finds that it also has track lighting on the aisles, a video tape machine with a projector capable of VGA and EGA graphics, as well as emergency lighting in case of a black out.

"The auditorium will host lectures,

concerts, exhibits, displays, and other programs in a vast range of needs and interests," said Paul E. Torgersen in "A Case for New Facilities," a pamphlet produced by the College of Engineering.

In between the old Randolph Hall and Hancock is the half glass, half shingle topped atrium, designed to "bring the outside inside type thing. Rather than just having an airspace between the buildings, they covered it over with the atrium roof — which is (actually) only half covered." Describes Price-O'Brien, "It seems the designers felt that if they had an entire glass roof, it would end up being too hot in the afternoons. So we kept the morning sun in, and then we blocked out the afternoon sun. It's a half-covered atrium — I don't know many like that."

In addition to the modern conveniences, Hancock Hall also caters to a long held complaint of this university: the lack of space. More than 1000 students receive undergraduate engineering degrees from Tech each year, and graduate enrollment has risen from 277 to 1200 in the last

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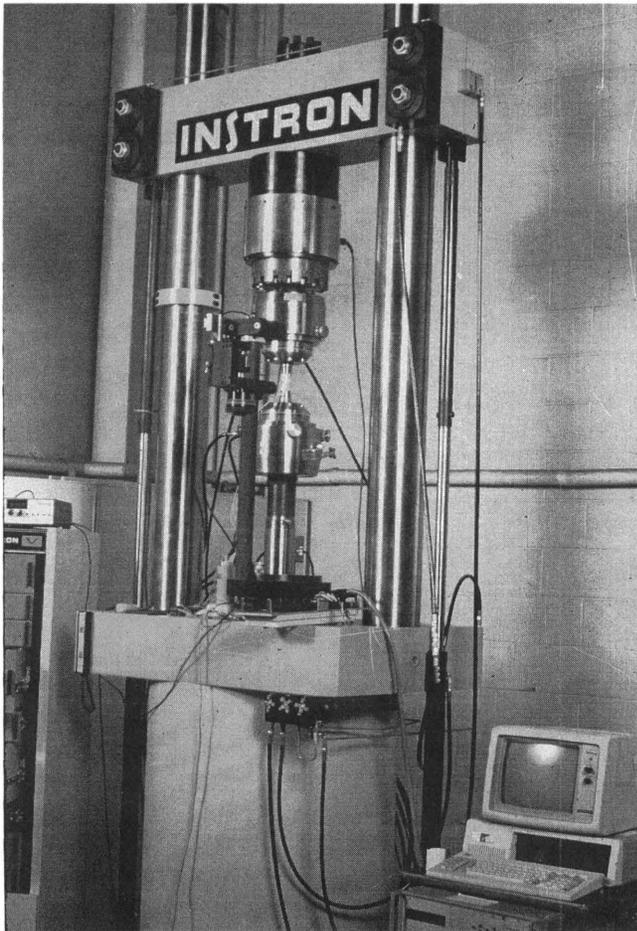
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twenty years.

Comparatively, "The College now ranks quite low among institutions of similar quality in terms of classroom and laboratory space," said Torgersen.

Hancock Hall is 99% lab space. "It will contain 20 laboratories, office suites, small class rooms, and seminar rooms. The laboratories will include two capstone facilities, a chemical engineering unit operations lab and a manufacturing, automation, and robotics lab. The remaining labs will be dedicated to materials science research," explains Torgersen.

Price-O'Brien illustrated that the new building definitely answers the need for new updated research space at Tech. "The Chemical Engineering space has needed a good, modern, expandable area to work in. Now they have all the fumehoods, high pressure, low pressure air, gas, water, steam — all the modern conveniences that weren't necessarily accorded in their other lab as well as a big two-story room so that they can set up big distillation towers and such."



The INSTRON, a high-stiffness bi-axial testframe, is only one of the huge machines to move from its former location — a cramped space in the basement of Randolph Hall — to Hancock Hall.

William Conger, head of the Chemical Engineering department at Tech said the new building gives his department "a chance to modernize the equipment in the lab."

In appearance, he explained, a comparison between the old lab of the late 50s with the new one gives the feeling that a life time has passed since the equipping of the original facility.

According to Conger, the Unit Operation Lab, a class required of Chemical Engineering students taken during the summer between their junior and senior years, will lose its reputation as a bad experience. "In the old facility, there was no way to condition the air; it was a very dirty, poorly controlled environment."

"Now, we have a controlled environment; we can (even) use computers because the temperature can be held at 70 degrees. It used to get over 100 degrees in the old lab."

Through Texas Instruments workstations, the Unit Operations Lab will be tied into a Control Lab and it will be able to be used all year instead of just in summer.

"There is a classroom built into the lab, with conduits between the computer room and the lab so to feed data into the classroom to allow more people to work with the data. Computer software brings us pictures of the process. We can disturb it, and then let the computer control (everything)," Conger said.

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The Industrial Engineering and Operations Research department, now called Industrial and Systems Engineering, "had been looking for expansion room for robotics for the past two years," he continued. "They've (now) got a very large, high-bay, square footage area for a robotics lab. The robotics area has a computer room containing a bunch of SUN micro-computer workstations — they call it the General Motors Manufacturing Control Laboratory."

Michael Diesenroth, the director of the Manufacturing, Automation, and Robotics laboratory, sees Hancock as a "research facility where we can study problems with modern manufacturing systems and controls," a place where higher level concepts from both business and engineering can be integrated in the machining and scheduling of a complex system.

One of the biggest problems at universities, he said, the difficulty of moving out industry's equipment after they've done their research, is eliminated in the new facility. At the back of the building is a large door through which trucks can be driven to deliver equipment, as well as a ten ton crane to move it about.

Located on the second floor looking down over this laboratory is the office suite, shared jointly by Torgersen and Diesenroth. Said Price-O'Brien, "Rather than being all the way over across campus at the Corporate Research Center, I believe (former) Dean Torgersen's background and true love is Industrial Engineering — so his offices are in the building."

"Somehow," he said with a smile, "I think that'll work out fine."

Lastly, "About 2/3 of the laboratory portion of the building is usable square footage space devoted to materials research — (particularly) composite materials research."

"We hope to draw industries attention to this so that we can have some sponsored research projects to further composite design, use, and failure analysis — particularly in the area of non-destructive evaluation."

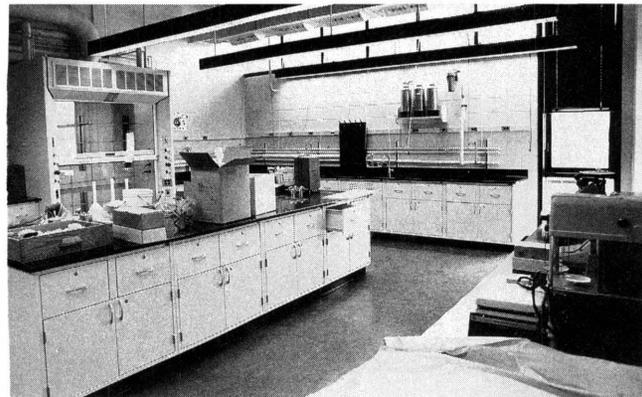
Price-O'Brien continued, "If you can see inside a piece with sonar, for example, if you could put a very low stress on it and see a thermographic pattern as the piece starts to heat, you can see where the stress concentrations are."

"The Materials section has been scattered. Wherever there was room, they put the equipment. They have had people in Holden, in Randolph, in Norris; they have had people over by the power plant and all over the place. Now many of the projects will all be centered right here in the same room."

"We're creating an environment that's already been here, but we're putting it all into one highly visible area."

This is one of the main goals of the building: to emphasize the fact that materials, industrial, and chemical research, is not a bunch of scattered ideas to be found all over campus, but a concentrated effort.

"We're looking forward to the (lower level of the) atrium



One of the spacious new labs in the Hancock Hall facility.

being a display or show-place to show off (these efforts) to students, faculty, and visiting people. It will tell them what this is all about and what they can do in here."

"There's really no better way to show off some of the things that you can do than to have a display area that'll show our outputs, the capability of our machines, our future expansion, and how much we've gone into it."

As for the future improvements to Hancock Hall, these take the form of a wish list, issued by the department heads. Conger mentioned the desire for a computer controlled distilling complex for the Chemical Engineering department. The complex itself is deemed as necessary for the department with a minimum expenditure of \$30,000. Instead of postponing the additional expenditure for a completely automated environment, Conger believes such a facility would be best installed at the very beginning.

"It is much more difficult to retrofit something later rather than when just starting," he said.

The Industrial Engineering group could use a machining center with a four or five axis machining capability instead of the three axis system presently available. Such a capability would allow sphere like objects — such as the nodes used in space structures — to be created.

In addition, a coordinate measuring machine to integrate testing the manufacturing tools with the area of quality and control would also be helpful to the student. With such a device confirming the dimensions of the newly machined parts, students would be able to make sure that their created parts were correct within specified limits.

In all areas of Virginia Tech's new research building, there is ample room for growth and opportunity. The building will symbolize as well as provide the place to test out "ideas, insights, development and application of skills," said former Dean Paul E. Torgersen.

"I don't believe there's another laboratory building of this type on campus," remarked K.L. Reifsnider. "We're going to try our best to make it work."

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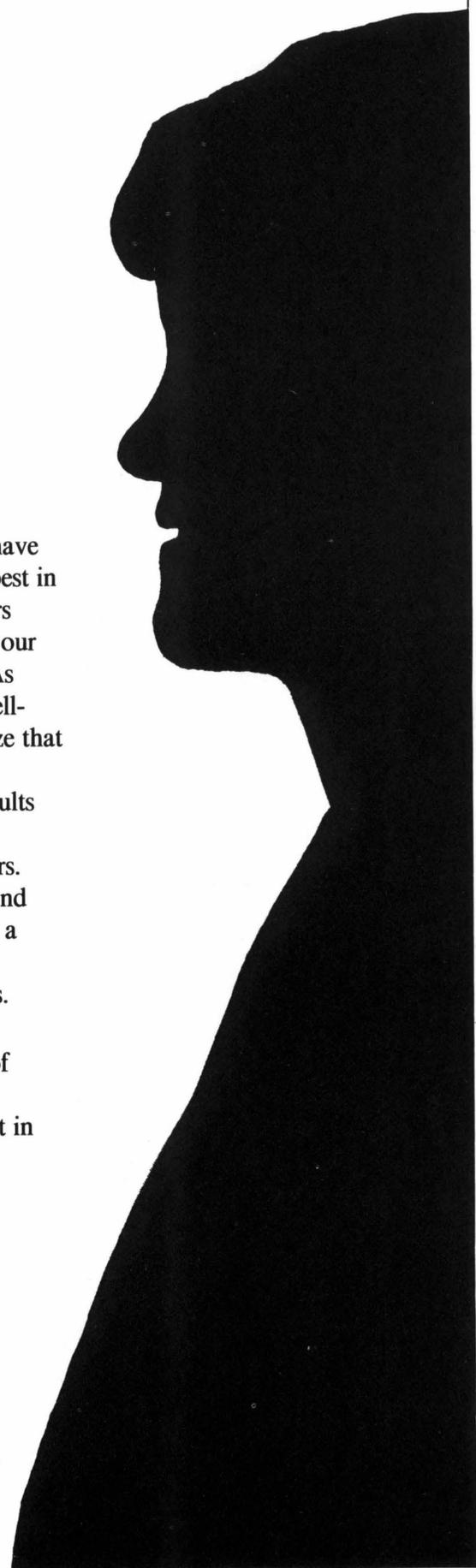
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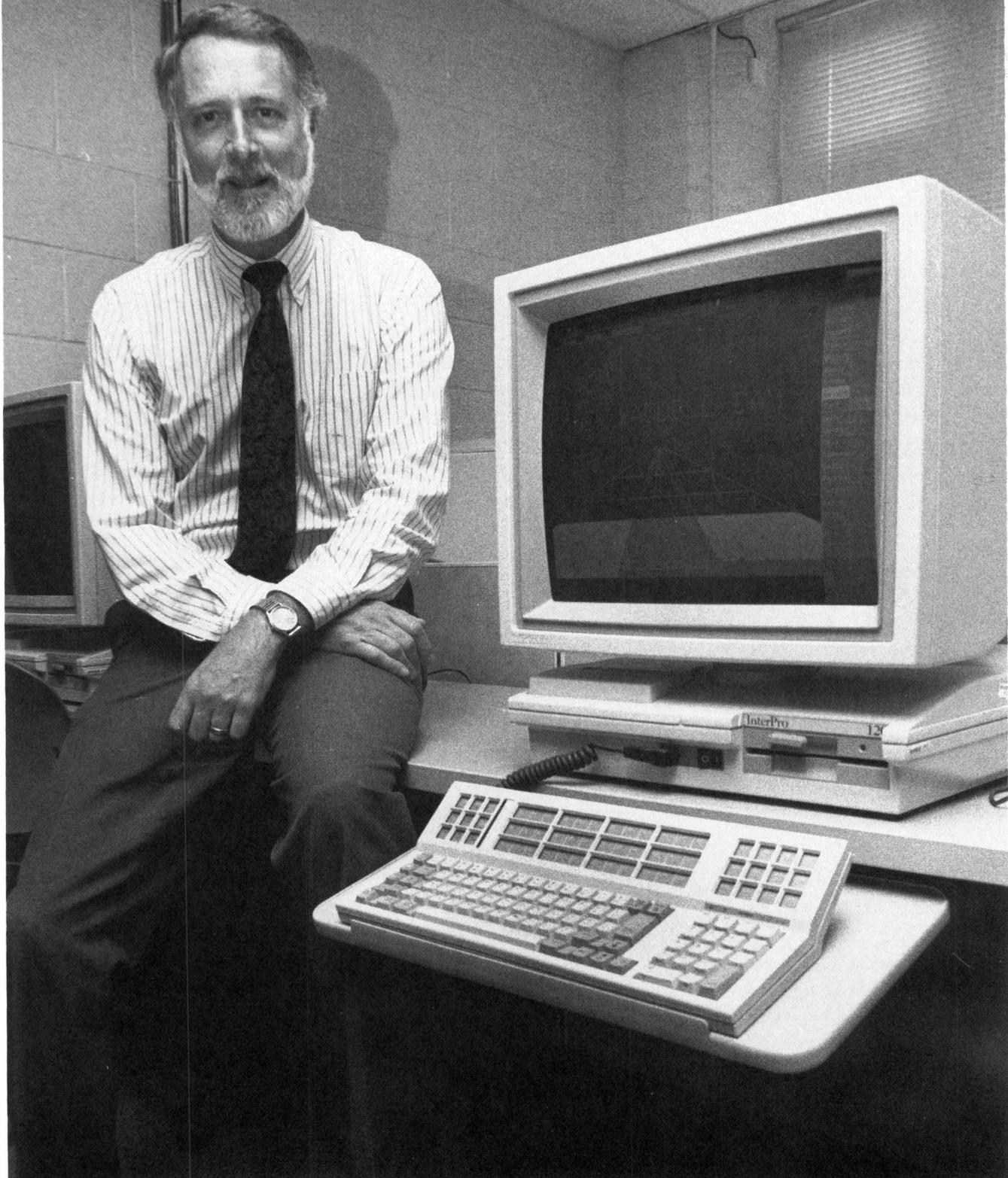
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G. WAYNE CLOUGH:



new engineering dean

by JONATHAN HESS

The summer has brought a significant change for the College of Engineering at Virginia Tech. As many students already know, G. Wayne Clough, the previous department head of Civil Engineering, took over as dean of the College of Engineering on July 1, 1990. He succeeds ex-dean Paul E. Torgersen who leaves a twenty year tenure as dean behind him.

With an undergraduate and Masters degree from Georgia Tech and a doctorate from the University of California-Berkley, Clough started at Virginia Tech in 1982. Prior to this time he taught at both Duke and Stanford universities.

In addition to his achievements as an educator, Clough recently became a member of the National Academy of Engineering, one of the highest honors for a professional engineer. He considers this membership to be very significant among his many awards because as he says, "it is a special recognition for a career's worth of accomplishments... recognizing your contributions educationally, professionally and technically." Some of Clough's other awards include the National Sci-

ence Foundation Presidential Young Investigators Award, the University Distinguished Professor and the Alumni Research Award.

Although these are all distinguished awards, Clough considers the almost 30 Masters and Ph.D. students he has touched or had some involvement with more important than any awards. He explains by saying, "It is to the point now that I will go to a city or a conference and I will either have a student or a student of a student that lives there and goes to school or works nearby. It sort of gives you a feeling of a lineage and how you have contributed to that."

This part of Clough's life is extremely important as he has set aside a coffee table in his home for all the Ph.D students that he graduates to carve their initials into.

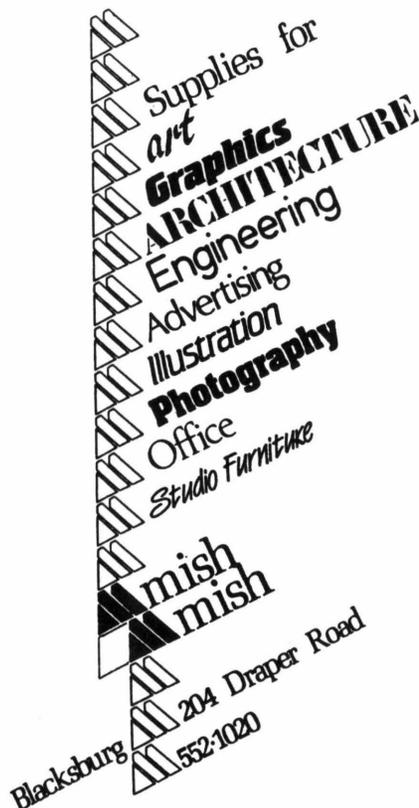
Besides his career as department head of Civil Engineering, Clough also acts as a consultant to over 50 geotechnical firms and governmental agencies. He started in geotechnical consulting by being technically oriented, specializing in tunneling. Through the years his knowledge of the overall project, including the construction side, company procedures and social and economic constraints, has grown immensely. Now when he works on a project he not only brings technical expertise but an understanding of how this technical side interacts with the social and economic sides.

Clough likes to limit his consulting work to projects that benefit a large number of people, like Metro Construction. Presently, he is working on the new production reactor project to replace the Savannah River plant. This project is important because at this time the plant has no plutonium protection capability.

As Clough steps into the dean's office, he hopes to continue to act as a consultant to these firms. Even though the position of dean will offer him many challenges and long hours, consulting usually only takes a couple of days, and then his part of the project is done. As for his most satisfying endeavor as a professor, specifically, advising Masters and Ph.D students, he would like to continue this as well on a more "limited" basis.

Throughout this past summer Dean Clough has been setting goals to add to his ongoing list. At the end of the spring semester last year, his list of immediate goals was quite extensive. However, through his own admission, he did not know everything he needed to know about the College of Engineering in the spring. Therefore, for the past few months and the next few months to come, Dean Clough will be interviewing as

See Clough, page 22



The Co-Op Experience: *Is It For You?*

by TONY GIUNTA

Perhaps you have seen the commercial with the wise man on a mountain top, asking the question "How do you get a job without experience, and how do you get experience without a job?" One of the answers to this Catch-22 is the cooperative education program.

Established at the University of Cincinnati in 1906, the cooperative education program (co-op) has grown to include approximately one thousand colleges and universities. Tech's program began in 1952 and was originally an engineering organization. During the 1960's, additional non-engineering curricula such as Math and Business Administration were introduced. For this reason, in 1968 the Co-op Program was moved from the College of Engineering and placed under the direction of the Academic Vice President of the University.

With the aid of federal funding in the early 1970's, Tech's Co-op Program was again broadened to include many more science, agriculture, and business majors. Also during this decade, the total number of schools offering co-op programs increased. Currently under the University Provost, the Co-op Program at Virginia Tech includes over forty different curricula and has an enrollment of approximately 1000 undergraduates.

As a co-op, a student spends alternating semesters in school and industry. The exact number of work periods depends on the student's particular schedule — usually about three or four sessions. The program at Virginia Tech is similar to most other universities in that co-oping is an educational option. Some schools have a required co-op program.

Most students begin their co-op experience in either the freshman or sophomore years. However, the program can be started as late as the junior year, decreasing the number of allowable work sessions. Primarily, a co-op's schedule is structured around the semesters during

which the student must take required courses, and the time periods when the employer needs the student to work.

There are many advantages and disadvantages to co-oping. A major disadvantage is that a co-op student will graduate a year later than a student who is following a four-year program. This may

Some co-ops discover a particular field of interest within their discipline, while others may realize that they are in the wrong major entirely.

bring about additional points of conflict. For example, unless the work site is near Blacksburg, a co-op may feel left out of both the social and professional arena at Virginia Tech. Plus, a co-op usually must take one or two summer semesters of classes in order to follow the established academic schedule. And there is the pressure of maintaining a certain QCA at the risk of losing the job.

Although the disadvantages seem severe, there are several arguments in favor of co-oping. Gaining of "real world" experience is a primary result of entering the co-op program. And different companies afford varying levels of responsibility. Usually by the final work session, the co-op is performing the duties of a newly-hired bachelor's degree graduate. This undergraduate experience has a value far beyond any wage measurement.

Working in the job environment can provide an insight into the type of work in which the co-op student may be involved. Some co-ops discover a particular field of interest within their discipline,

while others may realize that they are in the wrong major entirely. In both instances, the exposure to industry will help the individual better plan for the future.

After graduation, co-op experience is an advantage. Some co-ops receive permanent job offers from the companies for which they worked. If accepted, these usually carry over sick leave and retirement benefits that were earned by the co-op employee.

Additionally, the experience gained from the co-op program is looked upon favorably by other prospective employers. Within the current job market, co-op experience can be an important factor in determining which graduate receives a job offer.

One aspect of co-oping is difficult to judge — the question of money. Most private corporations pay more than the federal or state governments. However, governmental agencies often have more access to resources such as computing centers and research facilities.

Another consideration is the type of housing in which the co-op student will be living. Renting near a major metropolitan area can be expensive, even if the cost is shared with roommates. A car may be necessary if there is little public transportation. Costs for food and miscellaneous items, such as a telephone bill, can be high.

Several years ago, a student may have been able to finance college almost entirely on a co-op's salary — but this is almost an impossibility today. An out-of-state student who does not live at home while co-oping would find paying for college difficult. An in-state student may be able to afford tuition, particularly if the co-op could live and eat at home. Also, some co-ops lose their eligibility for most corporate scholarships once they enter the program. Co-ops are still eligible for University financial aid and some

See Co-op, page 20

Design Competitions Test Tech's Mettle

by GRADY KOCH

Many of Virginia Tech's engineering students, faculty, and staff spend countless hours working on regional and national design competitions. The competitions give students a chance to experience involved design projects; the best way to learn and master engineering skills is to apply them first hand.

Students also have a chance to travel, meet new people, and enjoy competition. Only two competitions are detailed below — many others can be found throughout the College of Engineering.

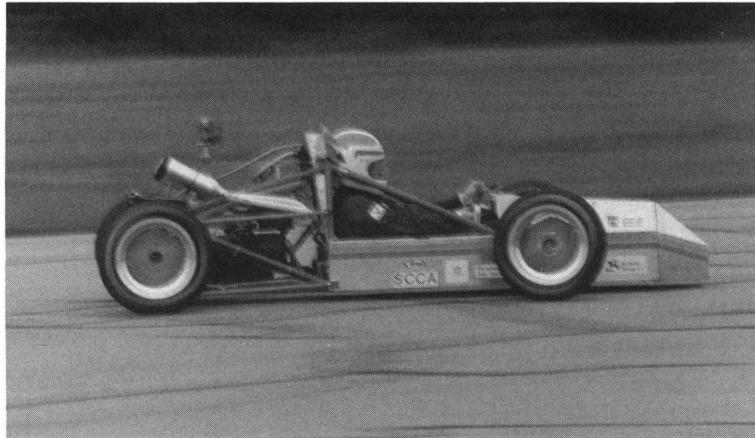
ELECTRICAL ENGINEERING

Virginia Tech won the student hardware contest at the Spring 1990 Southeastcon of the Institute of Electrical and Electronics Engineers (IEEE). The contest called for building a miniature car that could quickly navigate along a complicated path. Twenty-six schools from southeastern United States entered the competition.

The path that the car was required to follow was divided into two sections of track. On the first section, the car had to detect and follow a current flowing in a wire imbedded in the track. On the second section, a narrow white line painted on the track had to be optically detected and followed. The total length of the winding track was 40 feet.

Virginia Tech's best time in finishing the course was approximately 7 seconds. The next best time from all other competitors was about 9 seconds.

Two cars were raced at a time in a double elimination competition. The wire section of the track carried a current of 250 mA amplitude and 20.5 kHz fre-



"Tweak" goes through the paces at the Virginia Tech Airport.

quency. The car followed the current with two wire coil sensors — one positioned at the bottom rear surface of the car and another attached to a boom extending in front of the car. One of the coils generated an absolute magnitude signal while the other served as a phase reference. These two signals allowed the car's control system to know how far it was and to which side it was from the current carrying wire.

To follow the white line section of the track, infrared light emitting diodes (LEDs) were used to illuminate the track. Photo-transistors detected the light reflected from the white stripe and gave direction information to the control system. To filter out ambient light that may have confused the car, the LEDs were modulated at 40 kHz.

Virginia Tech's design for the car's control system gave the team a great advantage — an analog control system was used that allowed greater speed than most other competitors' digital control. The control system began with a proportional-integral-derivative (PID) circuit that was later modified and optimized with second derivative control.

Project leaders for the car were Eric Oiesen and John Burr with faculty advice

from Dr. W.T. Baumann. Mike Keitz provided a lot of ingenious electronic design for the car. Other team members included Rachel Carson, Phil Cataldi, Chris Cronin, Mike Dickerson, Zack Graber, Max Lupton, and Brian Roarke.

THE FORMULA CAR

For the past several years, Virginia Tech students have participated in a racing car design competition sponsored by the

Society of Automotive Engineers (SAE). The competition proceeds under the assumption that the racer is something that a fictitious consumer could buy for hobby competition. Over 50 schools from across the U.S. and Canada usually compete.

Restrictions on the car's design restrict engine displacement to 600 cc and engine air intake hole diameter to 20 mm. The cars are judged in two types of contests: static and dynamic.

Static events include three judging areas: cost analysis, over all design, and an oral presentation. For the cost analysis, each team must show how much it would cost to produce 1000 of the racers. Virginia Tech won this event the past two out of three years; last year's design cost \$3500. Overall design is also judged as well as an oral presentation of the design.

Dynamic competition includes test of skid pad, acceleration, maneuverability, and endurance. The acceleration test involves accelerating from a stop through 100 yd. — Virginia Tech's car could reach 60 mph in 5 s. The skid pad event tests lateral acceleration by driving the car around a 50 ft. diameter circle — last year's car could do 1.2 g of lateral acceleration before skidding.

Endurance testing involves racing

five cars at a time around eight miles of track; the average speed through the course is 40 mph. To test maneuverability the cars must navigate through pylons on a three mile track.

Virginia Tech's car had technical problems at last year's competition in Detroit — inclement weather shorted out the car's electronic fuel injection system. Despite the team's all night efforts to repair the damage, the car wouldn't work in time to participate in the dynamic events. The car did, however, perform well in static events and proved its dynamic merit later in the summer by taking first place and fastest time over all at an autocross competition held at Smith

Mountain Lake Airport.

Virginia Tech is again entering the contest this year and has already begun work on a new design. Design of the cars

...the best way to learn and master engineering skills is to apply them first hand.

begins with a three credit class held through the Mechanical Engineering Department under the auspices of Dr. R.J. Roby. Students form teams of three

or four people to work on a part of the car that they find interesting. Groups may specialize on the car's suspension, chassis, engine, or constant velocity transmission. Other groups may study aerodynamics, a turbo-charger, or a methanol fuel system.

A feature of last year's design was a new electronic port fuel injection system that dramatically increased engine torque. Last year's car also included an electronic sensor and data acquisition system.

Building of the car usually starts toward the end of Fall Semester and extensive road tests are conducted at the Virginia Tech Airport. Working on the car counts for credit in the Mechanical Engineering Department, but any interested person is invited to join the design team.

Last year's team included John Bobbitt, Todd Bowland, Jeff Collie, Joe Donovan, John Mills, Scott Mitchell, Debbie Newman, Tom Smith, and Chris White.



Many areas of expertise come together for the assembly of the formula cars.

IIE NEWS

by TIMOTHY BAKER

Eleven members of the Institute of Industrial Engineers (IIE) at Virginia Tech attended the International IIE Conference in San Francisco on May 20 through May 23, 1990. Virginia Tech received the international outstanding student chapter award. Several Virginia Tech faculty and students received individual awards for their achievements in Industrial Engineering. The students spent a couple extra days in San Francisco to visit the Golden Gate and Oakland Bay Bridge, Golden Gate State Park, Pier 39, Lombard Street, Alcatraz, Sausalito, several tall buildings, Berkley and other local attractions. After a few trolley trips, glass-elevator rides and visits to local pubs, the students left more than their hearts in San Francisco!

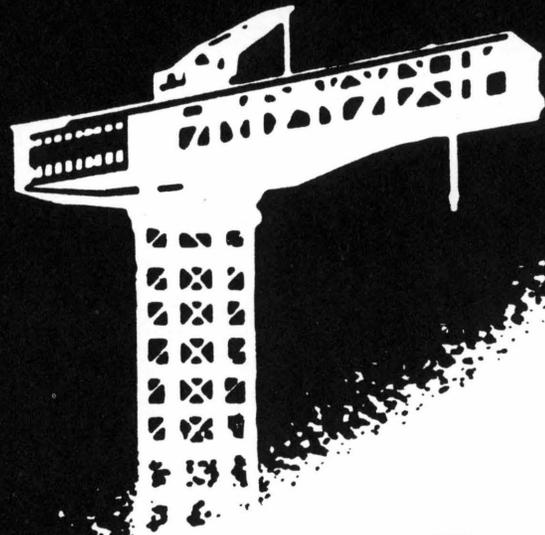
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Located in the Tidewater Virginia area, the shipyard is surrounded by a vast array of recreational and cultural activities. Just minutes away, the resort city of Virginia Beach hosts water activities of all types and descriptions. Also, the shipyard is just a short drive from the Blue Ridge mountains with their spectacular fall foliage and numerous winter ski resorts.

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SEC NOTES

To all VT engineering students:

The Student Engineers' Council (SEC) is a group of engineers who work with and for the many departmental engineering societies and the College of Engineering towards better communication and improvement of all aspects of the College. The SEC is open to all engineering students regardless of year or major. There are no fees of any sort. The SEC sponsors several activities for the College of Engineering and its students (i.e. EXPO, Engineers' Week, SEC Olympics, Superstars, Torgersen Award, Slush Fund, and other year-round activities). In addition, the SEC directly supports the *Engineers' Forum* and Dean's Committee.

Please consider this a personal invitation to get involved in SEC activities! You do not have to be a member to help or participate in any SEC events. Direct any questions or concerns to the SEC office in 110 Femoyer or call us at 231-6036.

— Timothy S. Baker, President, SEC

Upcoming Activities:

(For details, see the calendars in the tunnel between Norris and Holden.)

8/28/90 SEC Executive Meeting
(5 p.m. in 110 Femoyer)

9/ 4/90 SEC Executive Meeting
(5 p.m. in 110 Femoyer)

9/ 5/90 SEC General Meeting:

All engineering students are encouraged to come to this meeting and sign up to help with EXPO 90! We need everyone's support!

9/10/90 Presidents' Roundtable:

All Engineering society presidents should attend this meeting. EXPO '90 will be the main topic of discussion, followed by issues from the last meeting and new business. All presidents should bring an updated copy of their new officer's names, addresses, and phone numbers.

9/12/90 SEC General Expo Planning Meeting:
Final committee sign-ups and details of EXPO '90 will be discussed and settled.

9/16/90 EXPO Set-up and Registration
8 a.m.-11 p.m.

9/17/90 EXPO Set-up and Registration
8 a.m.-12 p.m.

9/17/90 EXPO 1990 begins at 12 p.m.-5 p.m.

9/17/90 EXPO 1990 Wine & Cheese Mixer

9/18/90 EXPO 1990 9 a.m.-4 p.m.

9/18/90 EXPO 1990 Clean-up 4 p.m.-?

9/26/90 SEC General Meeting

After the dust had cleared...

ASME (Team 1) Wins Superstars

"Get a base hit!" "Spike the ball!" "Pull! Pull!" These phrases (and others) were exclaimed by participants in the Student Engineers' Council (SEC) Superstars competition held on April 22 near the softball fields by the Rector Field House.

Double elimination tournaments were held in softball, volleyball, and tug-of-war. Any engineering society could participate. A faculty team, comprised of ex-dean Paul Torgersen, Dr. J.G. Casali, Lynn Nystrom, and others participated as well.

The event started at 9:00 a.m. Cheers filled the air. The better teams quickly distinguished themselves.

On this hot day, most of the men shed their shirts to cool off (and to catch

some rays). Kool-aid was guzzled by the gallon. Submarine-sandwich slices were provided for all hungry participants.

As the competition continued, three teams approached the semifinals: ASME (team 1), IIE, and ASME (team 2). First-place was at stake; the ASME (team 1) was favored to win.

Late evening found ASME (team 1), IIE, and ASME (team 2) as semi-finalists. All other teams had been eliminated. At the end of play, ASME (team 2) was declared the third-place winner. There was a tie for first-place between ASME (team 1) and IIE. After further competition, IIE, exhausted and evidently satisfied with a second place finish, forfeited the final volleyball match, to ASME (team 1).

Co-op

Continued from page 16

companies may pay part of a student's tuition, but often this will not fully cover all of the college expenses.

Some benefits of co-oping are unrelated to the job or to academic circles. Companies with large and well-structured programs often have special housing arrangements or promote social functions for their co-ops. Living in a new city or region allows the student to travel and experience a different environment. Also, working for a semester breaks up the school year and helps prevent mid-term burnout.

Co-oping can be exciting and rewarding experience but it is also a serious undertaking. Although a co-op can resign from the program if there are severe problems, there is a commitment between the student, the employer, and the Co-op Office at Virginia Tech. Also, there is a minimum QCA level to maintain. United States citizenship is a requirement for

most positions.

To find out more about cooperative education, visit the Co-op Office at 252 Henderson Hall or attend one of the co-op programs offered throughout the year. If you are looking to gain valuable experience and learn more about what the world outside of school is like, then a co-op job may be in your future.

Tony Giunta is a junior in AE who is also a co-op with NASA-Langley Research Center in Hampton, Virginia.

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Team stands behind its creations

Members of the Virginia Tech SAE Formula Car Team are pictured with their entries: "Tweak" (#29) and "Gerty" (#30).

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Clough

Continued from page 15

many people as possible, including department heads and faculty who have prominent goals in the college. It is Clough's aim to use these interviews as a building block to focus his goals and endeavors in specific departments. Not only will he be interested in faculty concerns, but he plans to make concerted efforts to find out the students' reservations by scheduling as many meetings as possible with various student leaders.

In the meantime, Clough has many areas in mind that he feels must be improved. For example, he would like to make an effort to balance the faculty members' schedules so there is an effective distribution of teaching, research, scholarship and professional service. One way Clough feels this can be accomplished is to make researching easier for the faculty. He feels that there are too many frustrations in the researching spectrum. As many students can attest, this tension often works its way back into the teaching arena. Clough hopes that minimizing unnecessary red tape will improve the research environment by making it more efficient and pleasant.

On the undergraduate level, involvement in research projects is something that Dean Clough feels is a necessity in today's world of engineering. One of his major fears as he begins his deanship is that students see teaching and research fighting each other. Conversely, Clough believes these two actually complement each other. However, he feels that an undergraduate must first partake in some research before he or she begins to see the importance of the teaching/research combination.

To sight a specific example, Clough recalled an incident during senior year as an undergraduate when he had not taken a very important class. Fortunately, the department head relieved him of this required course and started him on independent study instead. With this, he spent the whole summer in a lab working on a

beach erosion problem. In the end, this turned out to be a turning point for Clough in that it made up his mind to go to graduate school.

More and more undergraduate institutions are implementing research programs, so this seems to be an important step for Virginia Tech to take in order for

“When you actually meet these people (alumni)... you realize what the school has done for the people and the country.”

the school to maintain its high standards as one of the premier engineering universities in the nation.

Currently, the College of Engineering is responsible for the recruitment of undergraduates while specific departments solicit graduate students. Clough plans to change this and let the College of Engineering take more initiative in the graduate program in addition to each department's efforts. His ultimate goal in this area is to make the graduate program more personal as it currently seems very impersonal to him. With this, he feels the unfortunate gap between graduate and undergraduate students can be bridged. This seems realistic, since both undergraduate and graduate students have feelings and concerns for the college. Integrating the graduate and undergraduate students looks like an attainable goal, with the cooperation and encouragement of the students and faculty alike.

Some other areas Dean Clough plans to address are: an increase in recruitment and support of minorities, greater support of student professional societies, lack of space and lab equipment and enhancement of Virginia Tech's image so people in state know this is the best engineering program in Virginia.

Looking at the overall position of

dean, Clough is looking forward to the challenge most of all. The position will give him a chance to “deal with some of the larger issues associated with engineering education.” Although he has been involved with the improvement of civil engineering alone, “the idea that he can improve the environment for everyone,” will be more exhilarating.

Finally, like ex-dean Torgersen, Clough awaits the opportunity to meet with the “larger sphere of alumni.” He feels this is the “fun” side of being dean, while it makes him realize “the larger mission and contribution of Virginia Tech's departments to the commonwealth as well as the nation. When you actually meet these people (alumni), and find out all the things they have done, you realize what the school has done for the people and the country.”

Though Dean Clough expects a much busier schedule with his new position, he hopes to continue to enjoy his favorites athletics and hobbies. As some students might already know, Clough is an avid swimmer. “Swimming is good exercise and a good stress reliever!” exclaims Clough. He enjoys this sport so much, he makes it a point to swim four miles a week. Some other sports he enjoys are golf (for the social side and “beers afterwards”), sailing, and hiking. Much of his spare time is also consumed by his love for reading and computer programming.

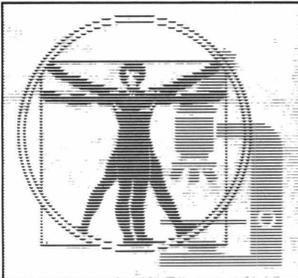
G. Wayne Clough definitely has the character, motivation and personality to continue the success of the College of Engineering. Despite the magnificent impact ex-dean Torgersen left on the College, Clough's ideas and ambitions for the College seem to be consistent with the excellent values, leadership, and quality Torgersen instilled in our College. Clough's determination to meet the challenges confronted in the Dean's office will be more than adequate to uphold the name Virginia Tech Engineering has worked so hard to achieve.

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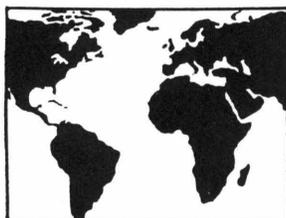
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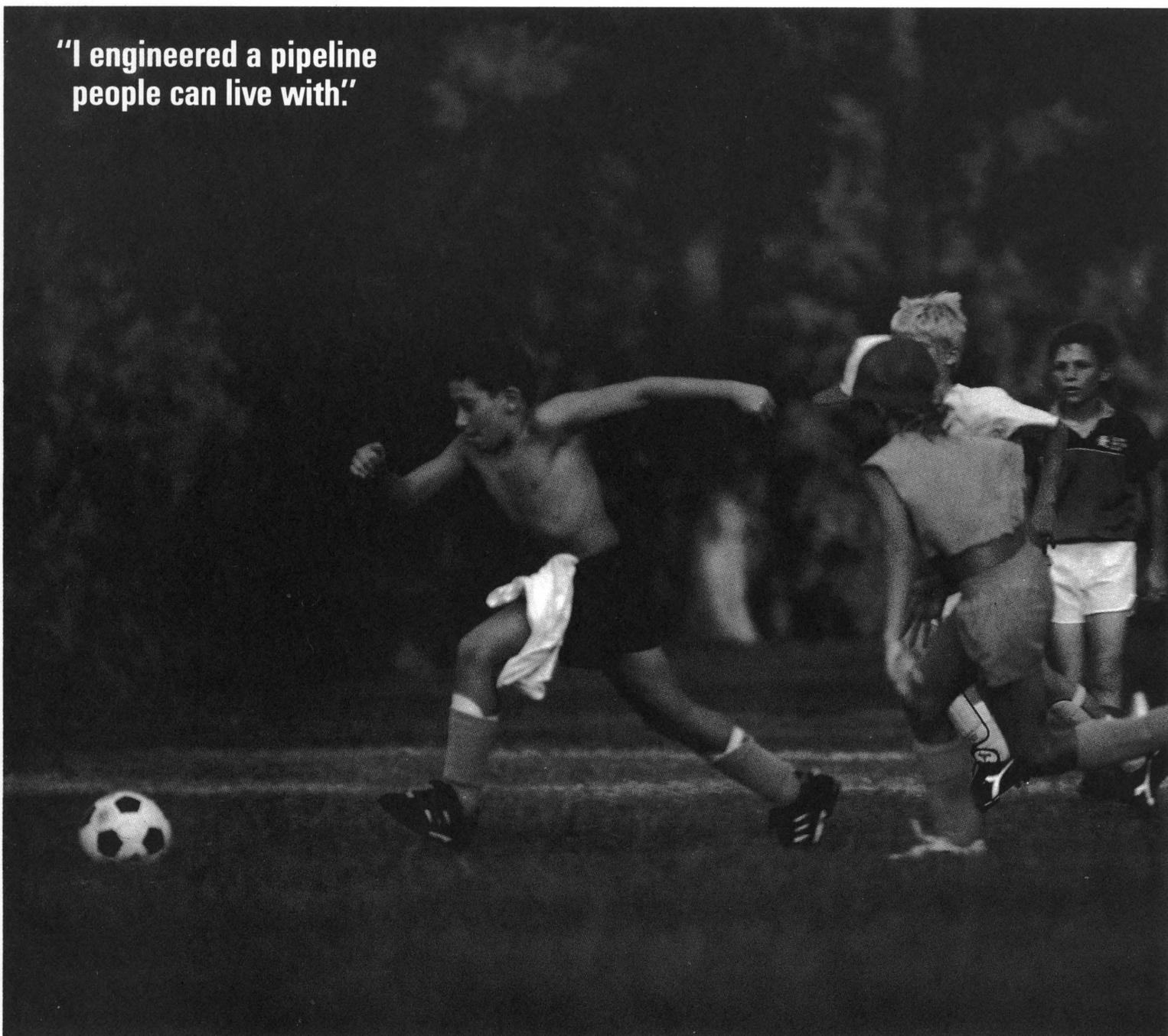
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