UPDATE

News from the School of Civil and Environmental Engineering

Cornell University Hollister Hall, Ithaca, New York 14853

Spring, 1980 *R. N. White, editor*

UPDATE ... from the Director and Department Chairmen

R. N. White

The past year has been an exciting time in CEE at Cornell. Our graduate programs are booming, and our research budget for 1978-79 was well over one million dollars. At the undergraduate level, we see signs of increased interest in CEE: the number of freshman engineers expressing an interest in the field last fall was up 50% from the previous year. However, we still need all the help we can get from alumni in counselling high school and prospective transfer students about the many, diverse career opportunities in CEE and related fields. If you can help us in this effort, please drop me a note, and we will send program information suitable for distribution to selected high school students.

We are planning for the future in several ways--an intensive review of the curriculum is under way; equipment and space needs (and they are many!) are being established for both teaching and research, and, as described on page 3, the School is taking the lead at Cornell in bringing state-of-the-art computer-graphics design techniques into the classroom. Another possible long-range project involves construction engineering and construction management. A number of faculty members feel that neither a graduate nor an undergraduate CE program is complete without construction engineering: we are beginning to explore the possibility of moving into this area. One major problem will be funding any new programs under the current "no-growth" budget restraints. I would greatly appreciate any response you may have to this idea.

Best regards for the rest of 1980, and thanks for the excellent response we received from so many of you last spring, when we published the first issue of UPDATE.

--R. N. White, Director
School of Civil and Environmental Engineering

A. H. Nilson

Areas of activity and growth in the Department of Structural Engineering, which include structures, geotechnical engineering, and CEE materials, continue to reflect our dual concern with education and research. While undergraduate enrollment in CEE is less than we would like to see, we continue to have far more well-qualified graduate applicants than we can accept. Research funding and expenditures have increased dramatically--almost doubled--over the past two years; topics now include the use of computer graphics in analysis and design, shell stability, finite-element analysis, high-strength concrete, earthquake engineering, fusion-reactor mechanics, cold-formed steel, fracture mechanics, progressive collapse, shear and bond phenomena in concrete, nuclear structures, drilled-shaft foundations, coastal structures, finite-element modeling of geological fault systems, transmission-line-structure foundations, tunnel-boring machine performance, mining subsidence, lifeline earthquake engineering, and sea-floor sediments.

NEED AN ENGINEER? *Job opportunities for our students often come through alumni-faculty contacts. Please write us any time you need some top-notch talent, and we'll pass the word to our students.*

We have a new member of the structures faculty, Dr. Mircea Grigoriu, who will join us this fall. His undergraduate education was in Romania, where he practiced professionally for several years before coming to the U.S. in 1973. He received his Ph.D. degree from MIT, and has recently completed four year' research in structural reliability and safety, a project which took him to Canada and South America. Because of the vacancy left by Professor Dwight Sangrey's move to Carnegie-Mellon, we are looking for a specialist in soil behavior and dynamics, and hope to fill the position by this fall.

The upgrading of the George Winter Laboratory, in Kimball-Thurston Hall, under the direction of Professor Tony Ingraffea, is still of high priority. To date, we have received several hundred thousand dollars to assist in modernizing this important facility. One major piece of equipment already in place is a 600-kip MTS testing machine of high stiffness, which permits tests of rock and high-strength concrete through the full range of inelastic behavior, with servo-control of load through strain measurements. We recently acquired a 160-channel data-acquisition/reduction system, controlled by its own computer, and are installing our earthquake-simulation shaking table for dynamic testing. The CEE School's innovations in the educational use of computer graphics will be very helpful in our undergraduate courses in structural analysis and design: facilities will be available this summer, and software is being developed for introduction into the curriculum next year.

--A. H. Nilson, Chairman, Structural Engineering

D. P. Loucks

Activities in Environmental Engineering are as diverse as the interests of our students and faculty. These few paragraphs give only a brief outline of our concerns.

In hydraulics, we are continuing to develop and refine the boundary integral equation method for such uses as solving wave problems, including waves caused by earthquakes, and in groundwater modeling, lake circulation, and pollutant transport. We are also studying ocean discharges from ocean thermal energy conversion plants; the stratified-flow basin, recently built in our hydraulics laboratory, allows us to simulate these mammoth structures that have been proposed as a means to tap the energy bound up in the oceans' thermal gradient. Long Island serves as a laboratory for studies in non-point-source nitrogen pollution, and for predicting infiltration and evapotranspiration and their combined effects on groundwater quality and quantity. Additional hydrologic and systems-analysis studies include the further development of models for generating synthetic streamflow data, for operation of multiple reservoirs, and for water-quality management. We are also participating in a multi-university research effort on agricultural pest management.

Faculty and students interested in both transportation and environmental water-resource systems are investigating the potential for improved data processing provided by coupling interactive computer graphics with various optimization and simulation models. The new interactive graphics laboratory will see use in both undergraduate and graduate courses. Other research projects in transportation include transit-service reliability, railroad operations and economics, electronic meassage-transfer, and air service to small communities such as Ithaca. Research projects under way in our envi-

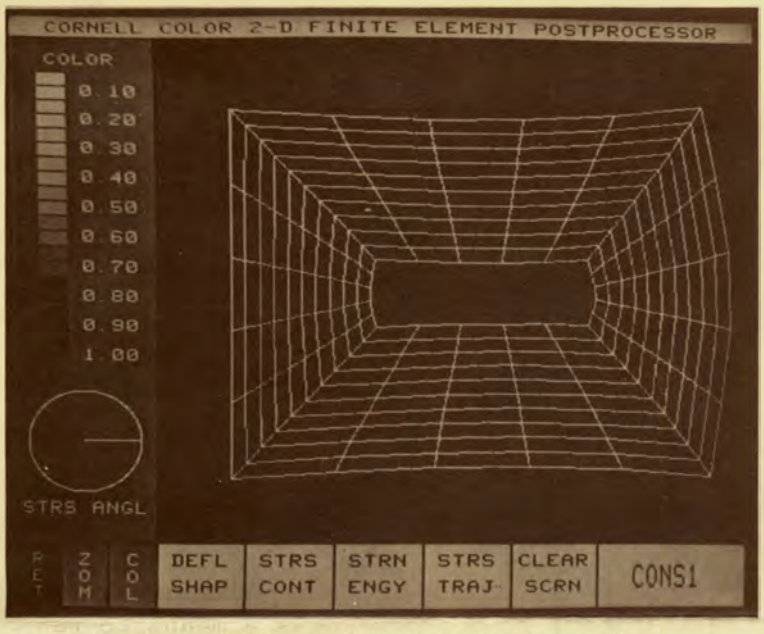
BUILD AN ENGINEER: *If you know young people who might be interested in careers in CE, let us know. We'll send program information describing the many careers open in CE (and giving reasons why a Cornell education is the best way to start out).*

ronmental engineering laboratories seek to determine better methods for integrating waste-treatment processes, the effect of chemical coagulants on the biodegradability of sludge, and methods of neutralizing acidified surface waters.

Public-utility pricing policies are being studied by students and faculty members in environmental economics and law, and just about every student in that field is trying to take our introductory--but demanding--environmental law course. This course exposes students to a wide variety of current environmental issues and controversies, and also to some of the language and methods we all need when working with lawyers from environmental regulatory agencies.

--D. P. Loucks, Chairman, Environmental Engineering

INSTRUCTIONAL COMPUTER GRAPHICS: Sketching Out Tomorrow



In a typical instructional exercise, the computer-graphics screen displays deformation in a flat metal plate stretched to the right. Lines show the plate before and after application of stress; data appears in margins.

CEE at Cornell is taking the lead in one of the most exciting and important educational developments of the past several decades--the incorporation of interactive computer graphics into the curriculum. This new technology is already being used in many industries, and promises to improve greatly the teaching of basic engineering principles. Even more important is its potential to expand our capabilities in teaching high-level, real-world design. The productive engineer of the coming years will have a host of interactive, easy-to-use computer graphics facilities at her or his command. We are committed to being at the forefront of this new development.

The College will install a new facility for instructional computer graphics in Hollister Hall this summer, for use in classes in the fall. Architecture Professor Donald P. Greenberg [B.C.E. '58, Ph.D. (Structures) '68] will run the facility. He has been director of Cornell's Program for Computer Graphics for a number of years, and has made his research center the number-one facility of its kind in the country. Much of the research there has involved CEE faculty members, including Professors John Abel and Bill McGuire in Structural Engineering and Professor Pete Loucks in Environmental Engineering. Many others will be involved in teaching applications: structures, transportation, and water resources will be the major initial uses. Development of new software is under way, and will continue for some time as we gradually incorporate computer graphics into the curriculum. Major proposals for support of equipment and software development have already been sent to a number of companies and agencies, but if you or your firm are interested in exploring co-operation in this area, please call Director White at 607/256-3690.

REUNION: *Mark your calendar now for the annual breakfast for CEE alumni and friends,* SATURDAY, 14 JUNE 1980, *7:30-9:00 in Hollister Hall. This year's breakfast will be an extra-special occasion, when we dedicate the Hollister Lounge in honor of retiring Dean John F. McManus, CE '36 (see story, p. 6).*

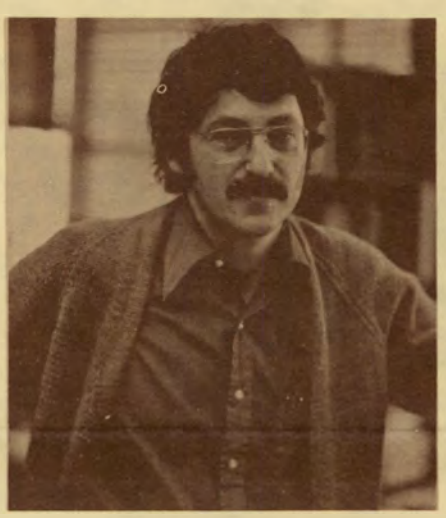
FACULTY NOTES: Arrivals, Retirements, Awards and Promotions

We were delighted last fall to welcome two new associate professors to the CEE faculty: Mark Turnquist in transportation and Warren Philipson in remote sensing.

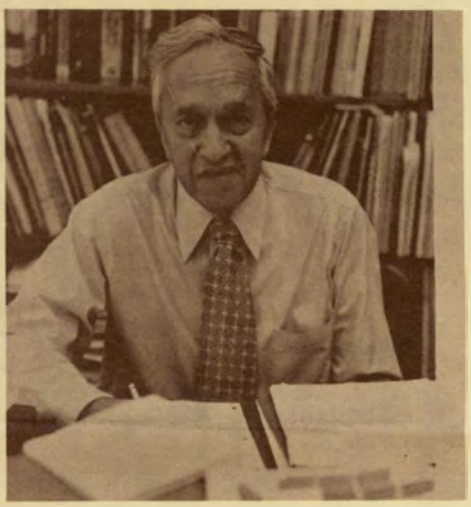
Turnquist came to us from Northwestern University, where he had been an assistant professor in civil engineering since 1975. He received his B.S. degree in systems science from Michigan State University in 1971, and M.S. and Ph.D. degrees in CE from MIT in 1972 and 1975, respectively. Among his teaching and research interests are the analysis, design, and evaluation of transportation systems, especially transit systems; the analysis of problems of supply and demand in transit systems is of particular concern to him. He received the Outstanding Teaching Award in CE at Northwestern in 1978.

Philipson has had a long association with Cornell, having received his B.C.E. degree here in 1965. Then followed two more Cornell degrees--the M.S. in photogrammetric engineering in 1968 and a Ph.D. in agronomy in 1975. From 1965 to 1972 he held various positions at the Cornell-operated National Astronomy and Ionosphere Center in Arecibo, Puerto Rico, and taught at the University of The Phillipines' College of Agriculture. From 1972 to 1979, he was a research associate and senior research associate in remote sensing at Cornell. His teaching and research interests span a broad spectrum of the uses of remote sensing in both CE and agriculture.

Turnquist



Philipson



Gates

The School's faculty was diminished during the year by the retirement of Arthur J. McNair and the departure of Dwight A. Sangrey, and this summer Charles (Don) Gates will retire.

McNair is very well known to many alumni, having taught at Cornell for thirty years. He has been a national leader in the teaching of surveying and photogrammetry; he developed the field of computational photogrammetry, later known as analytical aerotriangulation; and he was the first educator to serve as president of the American Society of Photogrammetry. Scores of his students hold responsible positions in research, teaching, and professional practice. Art's current activities include consulting, writing, and travel.

Sangrey, who was on the faculty in geotechnical engineering since 1970, left last January to head the CE department at Carnegie-Mellon University. We wish Dwight well in this exciting new undertaking.

HOLLISTER COLLOQUIUM: *Retired Dean Solomon Cady Hollister will be honored at a Princeton University Colloquium, "Perspectives on the History of Reinforced Concrete in the United States," on* MONDAY, 2 JUNE 1980 *(see story, p. 7).*

Gates retires this June after thirty-three years of distinguished service to CEE. He joined the faculty as an assistant professor in 1947, after eight years' practice and research in the fields of flood control, water purification, environmental sanitation, and desalination. In 1957 he became head of the Department of Sanitary Engineering, and in 1966 he was appointed chairman of Water Resources Engineering; his special interest has been water-quality phenomena. He has always combined theory with practice, and in recent years has been particularly active in teaching design. In 1971, he received a presidential citation for "his efforts to combat water pollution on Cayuga Lake." The Gates' plans for the future include travel, enjoyment of their newly-found leisure, and at least a little consulting work.

Two CEE faculty members received awards for teaching in 1978-79. Professor William McGuire (M.C.E. '47) was named Chi Epsilon Professor of the Year, and Assistant Professor Anthony Ingraffea received the Tau Beta Pi—Cornell Society of Engineers Excellence in Teaching Award. Tony's award included the $1,000 prize given annually to the best teacher in the entire College of Engineering. Other faculty members receiving honors recently include Philip Liu, who won both a Guggenheim fellowship and an Engineering Foundation fellowship for his 1980-81 sabbatical at CalTech, and Richard Dick, the Joseph P. Ripley Professor of Engineering, who was selected the Association of Environmental Engineering Professor Distinguished Lecturer for 1979-80.

Four of our faculty were promoted in June, 1979: Christine Shoemaker, James Bisogni, and Philip Liu to associate professor, and Fred Kulhawy to associate professor with tenure.

CEE STUDENTS WIN AWARDS: National Design Competition and Cornell's Fuertes Medal

Four members of the class of '79 were recognized by the James F. Lincoln Arc Welding Foundation last fall for their outstanding accomplishments in structural design. William C. Dass of Fishkill, NY, and Maryann T. Wagner of Ho Ho Kus, NJ, received the $1,000 First Award in the 1979 Student Engineering Design Competition, for their design of a large convention- and exhibition-center with a steel space-frame roof. Thomas E. Higgins III of Glastonbury, CT, and Timothy R. Miller of San Diego, CA, won the $250 Fourth Award, for their design of a steel-arch bridge over the Bisby Creek Gorge south of San Francisco. Both Dass and Wagner gained practical experience as undergraduates in the College's Engineering Cooperative Program; Dass worked with Stearns and Wheler, and Wagner with the Pittsburgh-Des Moines Steel Company. They are now in graduate school at Cornell and the University of California, Berkeley, respectively. Higgins and Miller are employed in engineering practice. The Department of Structural Engineering also received a $500 award from the foundation in recognition of the instruction received by the winning students. They were enrolled in the structural design course taught in the spring of 1979 by Teoman Pekö̈z and Richard N. White. This latest set of awards continues a very strong performance by Cornell CEE students, both seniors and M.Eng. candidates, in the Lincoln design contest.

Liv Haselbach ('79) won the Fuertes Medal in 1979. This award goes each year to the graduating CEE senior with the highest academic standing. Not only is Liv the first woman to receive this coveted prize; she is the first award-winner to complete degree requirements in fewer than eight semesters (it took her seven), and the first Co-op student to win the award.

HOMECOMING: *CEE will hold its third annual coffee-and-danish hour,* SATURDAY, 25 OCTOBER, *9-11 A.M., in the John F. McManus Lounge, just before the Homecoming game. Bring your family for a morning of refreshments and talk with old friends and CEE faculty members.*

DEDICATION OF THE JOHN F. McMANUS LOUNGE

Associate Dean John F. McManus (B.C.E. '36) needs no introduction to many hundreds--perhaps thousands--of CEE alumni. A key member of the College's administration for thirty-two years, John has decided to escape the rigors of personnel and budget problems, and retire this summer. We will be honoring him in a very special way at the CEE alumni breakfast on 14 June 1980, when we name the Hollister Hall lounge in his honor. The lounge is being completely refurbished to stand as a fitting tribute to an individual who has made so many important, if unheralded, contributions to the development of the College.

Some of you may wish to contribute to the special fund that we have established to finance the conversion of the McManus Lounge. Our design calls for changes to reflect John's character--a sense of both strength and friendliness that will enrich and warm the lives of the many thousands who will use the lounge for many years to come. A most fitting tribute to John's years spent carefully husbanding the College's budget would be a donation to this fund. Contributions should be sent to Director Richard N. White, School of CEE, Cornell University, Hollister Hall, Ithaca, NY 14853.

We hope to see you on June 14. Breakfast begins at 7:30, and the lounge dedication will be around 8:45. Please let us know if you are going to attend, so we can plan properly for breakfast. Response was so great last year, we almost ran out of food!

Left: Overflow crowd at last year's reunion breakfast, at which the School received a collection of scientific instruments from Joseph E. DeFrees ('29). Right: Mr. DeFrees stands with Director White in front of the instrument display case in the Hollister lobby.

JOSEPH H. DeFREES INSTRUMENT COLLECTION DEDICATED IN HOLLISTER HALL

Those of you who weren't able to attend the CEE alumni breakfast last June missed a special occasion--the dedication of an extraordinary set of antique scientific instruments given the School by Joseph H. DeFrees (CEE '29), president of the Allegheny Valve Company of Warren, PA. We are delighted to have this new resource for the School, and invite you to see it in the main foyer of Hollister Hall the next time you return to campus.

ENGINEERING: Cornell Quarterly, *the College's award-winning magazine, will print a special issue this Fall, featuring many of the papers to be presented at the Hollister Colloquium. For subscription information, write the* Quarterly, *254 Carpenter Hall, C.U., Ithaca, NY.*

HOLLISTER COLLOQUIUM AT PRINCETON, 2 JUNE 1980

The second of June this year will be a very special day for Cornell Engineering. On that day, at Princeton University, retired Dean Solomon Cady Hollister will be honored by a special colloquium, "Perspectives on the History of Reinforced Concrete in the United States." The colloquium is being organized by David P. Billington, professor of CE at Princeton, who has published widely on the history of our field. Papers to be presented will focus on aspects of Hollister's remarkably productive career, and at the same time treat each topic in the broader context of concurrent nationwide developments in the field. Contributions by Cornell CEE faculty members include: "Education in Reinforced Concrete up to 1917" by Richard N. White; "Reinforced Concrete for Ships" by Arthur H. Nilson; "Design Practice in the 1920's" by Peter Gergely and John F. Abel; "Development of a National Code for Reinforced Concrete Design: 1908-1941" by George Winter; "Contributions of S. C. Hollister to Developments in Concrete as a Material" by Floyd O. Slate; and "Innovator in Engineering Education--S. C. Hollister" by Walter R. Lynn. Additional papers are "Profession and Personality: Perspective on the Role of Individuals in the Use of Reinforced Concrete" by Billington; "The Growth of the American Concrete Institute: 1903-1934" by Robert E. Wilde, deputy executive director of the Institute; and "S. C. Hollister: an Engineering Educator as Consultant" by Neal FitzSimons ('50), a consulting engineer and chairman of the ASCE committee on history and heritage.

The colloquium is being sponsored by the National Endowment for the Humanities, the American Concrete Institute, the ASCE, and Princeton and Cornell Universities. You are invited to attend this joyous celebration of the distinguished career of Dean Hollister, and to help him and Mrs. Hollister celebrate their sixty-first wedding anniversary, which falls on the same day. Information about attending the colloquium may be had from William O'Brien, % The Princeton University Conference, 5 Ivy Lane, Princeton, NJ 08540.

Left: S. C. Hollister's most famous bridge (Chester, PA, 1925-26). Carrying Ninth Street over the Chester River, this concrete skew arch bridge and the paper describing it in the 1928 American Concrete Institute Proceedings *won Hollister the first Wason Medal ever awarded. Right: Dr. Yi-Sheng Mao and his daughter Yiyens Mao with Director White, on Dr. Mao's first visit to Cornell since receiving his M.S. in CE in 1917 (see story p. 8).*

VISITORS FROM THE PEOPLE'S REPUBLIC OF CHINA: Rebuilding Bridges

A group of civil engineers from China visited the CEE School last June. One group of six was headed by Shinghua Liu, president of the Southwestern Jaioting University and chairman of the Tunnel Commission of the China Civil Engineering Society. One of that group, Dr. Yi-Shang Mao, received his M.S. in CE from Cornell in 1917, and had not been back to Ithaca for sixty-two years. He is an eminent bridge engineer, and was recently president of the China Civil Engineering Society.

Another CEE alumnus from China, Wei Tseng (M.C.E. '36) also visited Cornell last fall, and we now have a visiting scholar, Bao-Kang He, with us for two years. Mr. He is studying cold-formed steel structures with Professor Teoman Pekö̈z. Professor Ta Liang spent two weeks last October in China, lecturing and advising on remote-sensing theory and applications.

Our final note from the East comes from another of our many Chinese alumni, James E. P. Tai (C.E. '29, M.C.E. '30), who wrote from Wuhan, China, where he has been a bridge engineer for many years. He wrote, "So happy to learn that China and the U.S. resumed diplomatic relations. China is so much behind in science and industry and high standard of living. Your help would be very very necessary. I am sincerely hoping that Cornell alumni will play an active part in the future co-operation of our two countries."

ALUMNI NEWS

Mr. Tai's was only one of the many cards and letters we have received from our alumni lately; we have room this issue to print only a sampling. Our next issue of UPDATE will feature a special, enlarged section of all the alumni news we have received. In the meantime, keep writing, so we can keep everyone in CEE up to date.

Thomas Jones (B.C.E. '52), Vice President of Unadilla Laminated Products, is one of our most active CEE alums, getting back to campus many times each year.

Robert A. Rubin (B.C.E. '61) is a partner in the law firm of Max E. Greenberg, Trayman, Cantor, Reiss and Blasky in New York, where he specializes in construction law.

John B. Campbell, (C.E. '14) of Campbell Water Wheel Company in Philadelphia, has sent us a map of the west bank of Cayuga Lake, which he made at summer survey camp in 1912.

Charles A. Weissman (B.C.E. '62) is president of Weissman Associates, with offices in New York and Rockville Center, NY.

B. K. Menon (M.C.E. '59) is Executive Director of the Al-Ghurair group of companies in Dubai, United Arab Emirates.

Edward F. Watson (B.C.E. '51) became City Engineer in Rochester, New York, in July 1979, after serving as Commissioner of Environmental Services.

Robert W. Goetz (B.S. '76) is a civil engineer with the U.S. Forest Service in Bemidji, Minnesota.

Carl Rentschler (M.Eng. '73) is the structural advisory engineer at the construction site of Korea's second nuclear power plant. He has been with Gilbert Associates for eight years.

Andre Martecchini (B.S. '78, M.Eng. '79) and Rick Migliore (B.S. '74, M.Eng. '79) are both with Petro Marine in New Orleans. Andre is working on offshore structural design.