

Division newsletter



American Society for Engineering Education

DIVISION: Civil Engineering
EDITOR: Ron W. Eck
West Virginia University

DATE: November 1986

CHAIRMAN'S REMARKS

Welcome back! I hope that each of you had a relaxing and productive summer and that your travels took you to Cincinnati for the Annual Meeting of the Society. It was extremely well run and well attended. Jim McDonough, Associate Dean and former CE Chairman at the University of Cincinnati, was the overall program Chair. He and his colleagues deserve an "Atta Boy" for a job well done.

At the Annual Meeting, a new CE Division award for service was presented to George Wadlin, Director of Educational Services at ASCE, for his many years of outstanding service to ASEE, ASCE and the CE Division. This award, which is named in his honor, will be presented whenever appropriate for extraordinary service to the profession and the Division. George will be retiring in October and can be found on a cove in Northern Maine looking for a lobster. However, he will continue to serve the Division as an Associate Editor of Civil Engineering Education.

On behalf of the membership, I would like to thank Fred Beaufait for serving as the Editor of Civil Engineering Education for the past several years. Fred has assumed the position of Dean of Engineering

at Wayne State University and therefore asked to be relieved of his Editorship. Through the efforts of Fred and Pete Hoadley, the first editor, this publication has grown both in number of papers presented and in quality. We wish Fred the very best in his new position. As of September 1, I have assumed the position as Editor of Civil Engineering Education so keep those papers coming in.

After several years of informal organization, the Board of Directors of the Division established a formal Awards Committee which is being chaired by Marvin Criswell. This committee will oversee the award which was presented to George Wadlin and also will be awarding an "Outstanding Paper Award" in the near future (hopefully at next year's Annual Conference in Reno).

Last year our Chairman, Colby Ardis, asked each of us to work on increasing the Division membership. Significant strides were made and I plan, with your help, to continue this effort. At the Annual Conference, the Division Board of Directors established a membership committee chaired by Anis Farah. Although numbers are important, it is even more important that we recruit active members. Our Division has a lot to offer -- a well respected journal, an active Annual Conference schedule, and close ties with our colleagues in ASCE.

There are plenty of opportunities to become involved at all levels. In addition, it is important to recruit "practitioners." After all, they are the ones who are employing our graduates; we need to hear their voice.

Finally, I would like to congratulate Ron Eck who has been elected as PIC I Chairman and Colby Ardis who was elected Secretary of PIC I.

In closing, I hope that each of you has a very productive year. If you have concerns or needs that are not being addressed by the Division please contact me or any of the members of the Division Board of Directors.

Gerald Seeley
Valparaiso University
Chairman, CE Division

GET READY FOR RENO

Mark your calendar for June 21-25, 1987 and plan to attend the 1987 ASEE Annual Conference in Reno, Nevada. The Division program is shaping up. Here is a preview of what to look for:

Monday June 22: "Non-Technical Issues Affecting Professional Practice",
Moderator: Dean Parsons

"Are We Getting Top Quality Graduate Students?"

"Civil Engineering Rap Session"
Moderator: Gerald Seeley

Tuesday June 23: "Excellence in Teaching"
Moderator: Noel Tolbert

"Civil Engineering Division Business Luncheon"
Moderator: Gerald Seeley

"How The Computer Enhances CE Education"
Moderator: Anis Farah

"Civil Engineering Planning Session"
Moderator: Mardith Thomas

"Civil Engineering Social and Dinner"
Host: Gerald Seeley

Wednesday June 24: "Computer Applications Poster Session and Software Exchange"
Moderator: Prahlad Pant

1986 ASEE ANNUAL CONFERENCE

SESSION SUMMARIES

"INDUSTRY INVOLVEMENT IN CIVIL ENGINEERING PROGRAMS"

Dr. Constantine Papadakis, Geier Professor of Engineering Education and Dean of the College of Engineering at the University of Cincinnati, opened the session by describing how co-operative programs in engineering education work as a catalyst to enhance the partnership between academia and industry. Eight years of experience at the University of Cincinnati since Herman Schneider's first co-operative program were summarized. The benefits to industry and outstanding advantages to the University that stem from a well-developed co-operative education program were discussed.

Preparing engineers for their new role in society was the subject presented by Mr. Gary L. Krause, graduate student in the Civil Engineering Department at the University of Cincinnati. Mr. Krause advocated that engineering educators should teach their students to develop the professionalism and community conscience that are necessary for their upcoming roles as leaders in our society. Two methods for helping the student develop these beneficial qualities were role modeling and making students aware of their professional

responsibilities that come with their diplomas.

Dr. William Zuspan, Associate Professor of Engineering at Drexel University, discovered that over 70 percent of engineering seniors at Drexel had experienced some ethical dilemmas while on co-op assignments. As a consequence, a one credit freshman elective course entitled "Ethics for the Pre-Coop" was developed at Drexel. This course was planned to be an awareness-raising program so the students could at least recognize an ethical situation when it developed. The course focuses on actual cases. Professor Zuspan presented some very interesting results from surveys that the students themselves conducted at Drexel. Each incoming freshman at Drexel is required to purchase a MacIntosh Computer. An expert system has been developed as part of the course to analyze cases using a decision-making matrix. This matrix is an easy way to illustrate the result of choosing a particular alternative in an ethical situation.

Industry expectations of civil engineering graduates were most appropriately addressed by William Brittle who is a Civil Engineering Supervisor with Bechtel Power Corporation in Gaithersburg, Maryland. Brittle maintained that due to the competitiveness in the job market, new civil engineering graduates must consider several traits beyond academic achievement in order to acquire successfully an entry level engineering position and in order to be successful early in their careers. Factors that are involved in selection of job candidates and the traits which contribute to the successful performance of a civil engineer were discussed in detail.

The session concluded with a dynamic discussion that was generated through a plethora of questions and comments from the audience. The issues on ethics and industry expectations dominated the discussions.

Constantine N. Papadakis
University of Cincinnati

"TEACHING CIVIL ENGINEERING DESIGN - STATE OF THE ART"

This session consisted of presentations on a variety of topics relating to civil engineering design education as follows: the definition of design and the role of creativity; industry-education interaction; industry needs and expectations of engineering design education; and the role of microcomputers in teaching design.

Dr. Fred Beaufait, recently appointed Dean of Engineering at Wayne State University, provided a thought provoking presentation on creativity in engineering design. Dr. Beaufait was concerned that many engineering educators stifle the creativity of our students by being too critical of their efforts. He recommended that in addition to the rational approach to decision-making that "lateral thinking" be encouraged.

Dr. Richard Wetzel, Professor of Civil Engineering at the University of Wisconsin-Platteville, described a "capstone" design course taught in the civil engineering department at Platteville. The course components as detailed by Dr. Wetzel provided an opportunity for interaction with society, use of communication skills, personal growth as a team member, creativity, and a transition to practice. This course also served as a vehicle for practitioner involvement in the education process.

Dr. Stanley D. Lindsey, President of Stanley D. Lindsey & Associates, presented the consultant's viewpoint of engineering education. Dr. Lindsey indicated his firm wanted to hire the best graduates that will require the least training and become productive in the shortest possible time. He suggested this could best be done through direct involvement in the educational process by the consultant. His firm encourages its' staff to work with educators. They do this through joint research projects, supervising theses, and teaching classes. Dr. Lindsey hires only graduates that have completed a Master's Degree and prefers students well grounded

in the fundamentals of analysis and behavior. He suggested that schools should not spend a great deal of time teaching design but rather give the student a strong theoretical background. He stated that "one does not learn design in college--it can only be learned from years of actual "hands-on" experience which is not possible in college."

Dr. Gregory Riggs, Associate Professor of Civil Engineering at the United States Air Force Academy, concluded the session with a presentation on the Academy's experience of intergrating microcomputers into the undergraduate curriculum. His presentation was complemented by the use of an IBM-PC connected to a large screen projection monitor. Several "live" examples with extensive graphics were demonstrated that were of broad interest to the audience. Dr. Riggs also spoke of their three-level "tiered" approach of using microcomputers which heightened student interest in the subject material, improved student performance in understanding behavior, and helped to develop their sense of engineering judgment.

Additional information of any on the presentations in this session can be found in Volume 2 of the 1986 Annual Conference Proceedings.

Noel Tolbert
Tennessee Tech Univ.

"COMPUTER LITERACY EXPECTATIONS OF CIVIL ENGINEERING GRADUATES"

This session was sponsored by the Committee on Computer Applications and was moderated by A. Farah. The papers included in this session featured authors from both industry and academe. The industrial representatives discussed their expectation of computer literacy of new graduates and pointed out the problems faced by the new engineer. The engineering educators discussed curricula and some specific computer applications in civil engineering education. Summaries of each of the papers are presented below.

In "Application of the Fast Fourier Transform," A. Farah of Laurentian University discussed the Fast Fourier Transform (FFT) which is a technique to facilitate data analysis by efficiently computing the discrete Fourier transform (DFT) of a series of data samples (time series) usually obtained from experimental measurements. The procedure results in substantial savings in storage requirements and computation time. An example was given of the transient acceleration-time history of a vibration system. The transformation of the record to the frequency domain gives the resonant frequencies of the system. It was shown that using the FFT, the computation effort could be reduced by 3800 times as compared to that required by the DFT. The author emphasized the advantage of using the FFT in laboratory and field measurements to impart to the student greater understanding of engineering phenomena.

In "Computers and Structural Engineering Education," F.A. Charney and M.S. Ketchum of KKBNA, Inc. suggested that young engineers entering the profession should not only be able to use the computer for solving engineering problems, but should do so efficiently, and should have a basic understanding of the engineering principles underlying these problems. They also recommended that the student have reasonable understanding of how the computer and the operating system work. This will enable him or her to efficiently create and manage files and properly control the input to and the output from these files, such as, printing and plotting. Topics discussed in the paper include: the computing environment at KKBNA, use of computers as a processing tool, and design and analysis performed on the computer.

In "Some Observations on Use of Computers in Steel Design Courses," R.G. Boggs of the U.S. Coast Guard Academy noted that his interest in steel design pedagogy led him to spend the most part of a sabbatical year examining the approaches used by several universities in their design courses with particular emphasis on the use

of the computer. He pointed out that the engineering educator has the responsibility of guiding the student in the use of the computer as a design tool, and of ensuring that engineering graduates have well developed understanding of computer methodology. He recommends the development of special "intelligent" software, such as EXPERT, to enable the student to fully interact with the computer while learning the design process. The author further emphasizes that students should be able to check thoroughly their computer results by approximate methods of structural analysis.

In "Seepage Finite Elements Graphics on the Apple IIe," G.R. Imm (Amoco Production Company) and E.S. McCullough (University of Wisconsin-Platteville) discussed the advantage of constructing flow nets using the computer, as compared to sketching of nonhomogeneous and/or anisotropic soil conditions manually. They described a computer program which solves the Laplace equation by finite elements and then computer graphics are used to display the corresponding set of equipotential lines. The ease with which the students use the program after a classroom demonstration impresses the students and enhances their motivation. The paper described the theory, mesh generation and computer graphics. A sample problem dealing with the core of a rockfill dam was presented and discussed.

In "Development of Computer Literacy Through Enhancement of the Civil Engineering Curriculum," T.A. Weigel and T.E. Fenske of the University of Louisville described a method of incorporating the necessary instruction into the C.E. curriculum. This consists of emphasizing computer usage in existing courses while introducing a new course dealing with computer science principles. The main objectives of such a course include the familiarization of the student with state-of-the-art software including operating systems, text editors, word processing and communications systems and the development of an understanding of computer-aided design. A course outline was given and semester projects were suggested in

transportation, hydraulics, structures and geomechanics.

In "Student Interest in Computers at New Mexico State University," T.J. Ward and C.G. Keyes, Jr. presented the results of surveys taken over the period 1984-86 at New Mexico State University. In the surveys, students were asked questions, such as: did you use a computer in your course last semester?; could you write a computer program today?; and how much should the computer be stressed in engineering education? The results show that there is strong evidence that efforts taken during the last few years by the C.E. Department at NMSU have resulted in increased computer literacy.

In "Industry Expectation of Computer Literacy and Applications of Civil Engineering Graduates," N.K. Gosain and A.K. Harris of Walter P. Moore and Associates noted that industry demands that engineers be more innovative, accurate and cost conscious. To achieve this, engineering education must cover not only the classical methods of analysis and design, but also the more modern computer-related techniques. This will enable the student to carry out such tasks as second order analysis of multi-story buildings and dynamic analysis of structures for both wind and seismic excitations. The paper dealt with such topics as: the plight of the new graduate, importance of graduate studies, computerization and minimization of errors, and changes in the engineering curriculum.

Anis Farah
Laurentian University

"TRANSPORTATION ENGINEERING POSTER
SESSION AND COMPUTER SOFTWARE
EXCHANGE"

The session was a great success as evidenced by the large turn-out of speakers and attendees. Both Joe D. Armijo, Montana State University, and his student-researcher Lloyd Rue traveled to Cincinnati to present their paper "Bozeman Transit Study: C.E. Students Contributions to Community", James

R. Evans, University of Cincinnati, presented his paper "Quality Control in Transportation and Logistics". Dr. Scott Harvey, Association of American Railroads, made a short visit to Cincinnati to present the paper "University-Industry Partnership in Railroad Research" which he had coauthored with William J. Harris, Jr., Texas A & M University. Jiwan Gupta, University of Toledo, demonstrated the software described in the paper "Use of a Personal Computer for Transportation Engineering" by A. Kumar, J. Gupta and J. Lee (all of Toledo). Richard W. Lyles, Michigan State University, presented the paper "Wonderland Revisited: Transportation Planning Then and Now". Donald L. Woods, Texas A & M University, demonstrated the software on Transportation Systems Management that he had jointly developed with John M. Mason, Texas A & M University as described in their paper "Self Training Materials for Transportation Systems Management". Prahlad D. Pant, University of Cincinnati, presented the paper "Do Universities Properly Educate the Traffic Engineer" coauthored with James F. McDonough, University of Cincinnati, Ramey O. Rogness, North Dakota State University, presented the paper, "Transportation Technical Information Dissemination: A Cooperative Partnership with Governmental Agencies" by Rogness, E.A. Tuft, and D.A. Anderson (all of North Dakota). Finally, Randy B. Machemehl, The University of Texas at Austin, was unable to attend the session; however, his paper "An Evaluation of a Simple Computer-Aided Instruction System for Undergraduate Civil Engineering" is published in the Conference Proceedings.

Prahlad D. Pant
University of Cincinnati

Editor's Note: The final CE Division session at the Annual Conference in Cincinnati was "Perspectives on Professional Practice," which was organized and moderated by Dean Parsons of CH2M Hill. The session generated quite a bit of discussion at the Conference; unfortunately, the two papers presented were not included in the Proceedings. Thanks to the efforts of the

speakers and Dean Parsons, shortened versions of the papers have been prepared. Since the readership has requested more guest editorial type articles and since these papers are thought-provoking and have the potential to generate healthy discussion, the Editor has decided to publish both of them in the Newsletter. The "Consultants Viewpoint" appears below. The other paper, "Industry's Viewpoint" will appear in the Spring 1987 issue. Reader comments are encouraged.

PERSPECTIVES ON PROFESSIONAL PRACTICE THE CONSULTANT'S VIEWPOINT

J. MICHAEL ANGELEA, P.E.
GREAT LAKES REGIONAL MANAGER
CH2M HILL, INC.

First, let me say that I am continually impressed with the quality of today's engineering graduates. The young graduates entering our firm are highly motivated, have a strong work ethic and a sound technical foundation upon which to build. Because of the many different roles a civil engineer is called upon to undertake during his or her career, the preparation needs of our young engineers go beyond those of technical skills.

The civil engineering practitioner is in a unique position. No other field of engineering is called upon to provide a broader range of talent needed in today's society. The role of the civil engineer frequently goes far beyond that of the designer of the next building, bridge, or highway. The civil engineering profession, more than any other, provides the managers for many of our nation's private practice firms and public works agencies in highly visible positions. The engineering manager receives much criticism for the leadership of unpopular projects or notable failures. At the same time, there is a general lack of understanding and recognition by our society of the many contributions the civil engineering profession continues to make in furthering the quality of life.

Civil engineers as consultants providing a service to public or private clients are often called upon to assist clients in conveying to the public and local and state government agencies knowledge of projects of a controversial or sensitive nature. Frequently, issues relating to regulatory requirements must be addressed. The need for change in legislation is often required. Civil Engineers must sell themselves and their clients' projects to many different audiences in various ways.

The civil engineer must be an effective communicator and manager of people. The days when the stereotypical engineer with the green eyeshade labored over the boards to crank out a set of plans and specifications and then oversaw the construction with little assistance are long past. In today's complex and highly sophisticated society, few projects, if any, can be accomplished without a multidiscipline team effort. In most cases, a multidiscipline team must be brought together to ensure the successful delivery of today's projects. The civil engineer must be able to recognize and acknowledge this need, bring together and lead such a team. The civil engineer must also recognize that not all problems have a black and white solution. There are myriad political influences that may affect the solution to a given problem. At the same time, he or she must stand steadfast, maintaining the highest level of professional ethics and not compromising the technical solution to the detriment of public welfare.

In CH2M HILL, we challenge our young people to demonstrate and further develop their leadership skills. Very early in their careers, they may find themselves in a leadership role on a major portion of a project or maybe an entire project. In this capacity, they must be able to communicate effectively with other team members on the project as well as with the client, regulatory agencies, and various publics. This role requires the engineer to have the ability to develop and administer contracts, project schedules, budgets, and quality control programs. The engineer in this capacity will probably be directly

responsible for some technical aspects of projects. However, a considerable amount of his or her time will be spent in a variety of administrative and technical management functions. It is in these areas that the engineering graduate needs to be better prepared.

The undergraduate curriculum should be enhanced. Increased emphasis on communications, people-management skills, and professionalism is needed. I know that for years there has been debate about whether the undergraduate degree program should be four or five years in length. Some may suggest even longer. It is very unpopular to talk in terms of a five-year or longer program. There is tremendous demand on limited resources. At the same time, the young engineer is anxious to get into the workplace. We talk about the need for increased emphasis in liberal studies and the need to have a special course in this topic or that. To pursue a career in engineering means that the student must be ready to make a significant commitment to an academic program that only the best and most highly motivated students survive. This puts the engineering schools at a competitive disadvantage when high school graduates are making their decisions on career choices. To add a fifth year to the undergraduate curriculum would certainly increase this competition.

I believe the present undergraduate curriculum can be enhanced without extending the four-year degree program. Undergraduate students should be strongly advised to incorporate in their liberal studies elective courses that build communications and people-management skills. In the area of engineering management, focus on the politics of our roles, contract development, personal responsibility, and professionalism should be an integral part of these courses.

Content can be added to present course structure. Lecture content can be expanded to show how the specific problem before the class fits into the whole picture. Why do a particular bridge and roadway need to be built? What are the various social impacts

of increased traffic volume in a particular area? What are the alternative means of financing the project? Or what does it mean to an industry to improve the quality of its process water discharge to the local stream or public treatment facility? Are the regulations being imposed on industry appropriate and fair? Will the expenditure of funds for the new treatment facilities place the industry at an economic disadvantage with its competitors? What happens if as a result of the needed facilities the industry closes its doors? What are the potential social and economic impacts on the community in which the industry is located? A brief discussion of these aspects of any given problem can be incorporated in a lecture without expanding the time.

The course curriculum can and should focus more on the professional aspects of engineering. It is appalling to witness the lack of professional ethics displayed at times in our profession. Of course, in the field of private practice all engineers must become registered professionals, and they are evaluated on a strict set of professional standards. Engineering faculty need to be more actively involved in the professional engineering societies and be registered as professional engineers. While our young engineers are coming to us highly motivated and technically competent they do lack a sense of commitment to the professionalism of their career and a good appreciation for the ethics of our practice.

The engineering faculty should make more use of guest lecturers or informal discussion sessions with students where people in business, industry, and public life are invited to meet with the engineering students. The engineering faculty should continually seek opportunities for themselves to gain experience in the practical application of today's technology. Many do through private consulting or summer employment off the university campus. More opportunities should be sought and provided.

Finally, any university should not try to all things to all people. There is tremendous

competition for limited resources on all campuses across the country. There is a constant pressure to provide new programs to attract more students, or presumably to enhance the national image of a particular university. It should develop a reputation -- an image for being the best there is in those particular areas.

CE DIVISION BUSINESS MEETING
Tuesday, June 24, 1986
1986 Annual ASEE Conference --
Cincinnati

Twenty-three members of the Civil Engineering Division met at the 1986 Annual ASEE meeting at the Cincinnati Convention Center to conduct the business of the Division. Colby Ardis called the meeting to order.

Secretary/Treasurer Ron Eck presented the Treasurer's Report as contained in a handout he distributed. The Division is in good shape with \$6,301.00 in the BASS account.

Ron Eck expressed concern about the high cost of the Division Rap Session held the previous evening and suggested that ways of financing this annual event be explored. There was considerable discussion of this issue. General feeling was that charging participants a small amount would be counterproductive. It was suggested that in program planning, the ASEE staff be informed that the Rap Session be planned on the basis of "not to exceed" a certain dollar amount.

Ron Eck announced the election results:

Chair:	Gerald Seeley Valparaiso University
Vice Chair:	Mardith Thomas Iowa State University
Director:	Edward Reitz City Univ. of New York

Since Mardy Thomas was elected Program Chair, her position as Director became vacant. Eck reported that the Division Executive Committee had earlier appointed Anis Farah (Laurentian University) to fill Mardy Thomas' unexpired term (through 1988).

Ron Eck presented a brief summary of the Newsletter readership survey he conducted. In general, Division members are pleased with the format and content of the Newsletter. He recommended that efforts be made to involve, in Division activities, those who do not attend Annual Conferences. He asked that any suggestions be forwarded to him.

Colby Ardis reported that Fred Beaufait, editor of Civil Engineering Education, had been named Dean of Engineering at Wayne State University and would not be continuing as journal editor. Jerry Seeley is interested in the editorship and will assume that responsibility subject to the approval of his dean. George Wadlin will be a new Associate Editor. Colby Ardis asked for volunteers for the Associate Editor positions.

The Division annual report was distributed and discussed. Marv Criswell was named Chair of the Awards Committee. Colby Ardis asked for a volunteer to chair the Membership Committee to stimulate and encourage new ASEE members. Discussion followed. Ardis suggested having the Directors serve as a membership committee for the Division. Anis Farah agreed to serve as Chair of the Division's Membership Committee. In the future, the "mid-term director" will automatically assume the role of Membership Chair.

Colby Ardis reported that a plaque would be presented to George Wadlin at the Annual Banquet. This would be the Civil Engineering Educational Services Award established in honor of George Wadlin by his friends and colleagues of the CE Division. The award would be a continuing one, though not necessarily given on an annual basis.

Colby Ardis reported on the most recent ASCE-EDEX meeting. He emphasized the importance of Division representation at EDEX and CC&A meetings. Reitz moved that the Division allocate up to \$250 per year for the Program Chair to attend CC&A meetings and up to \$250 per year for the Chair to attend EDEX meetings. The motion was seconded and carried unanimously.

Jerry Seeley summarized the 1986 Annual Conference activities. Twenty-two of the 26 papers sponsored by the Division appeared in the Proceedings -- this is an excellent record.

Criswell asked for volunteers for the Awards Committee to help carry out a variety of activities. An "Outstanding Paper Award" has been initiated. The Committee will begin reviewing papers in the near future. Problems have been encountered in getting a corporate benefactor for a major Division award. Approximately \$1500 per year is needed to support such an award. There was discussion of the newly initiated Wadlin Service Award. The award should not become an automatic award to the outgoing Chair. Discussion followed. It was agreed that the award would be more prestigious if the Board issued it only when so desired. The award will consist of a plaque and recognition; there is no monetary stipend. Criswell mentioned the need to have civil engineering educators nominated for "fellow" status in the Society. Nominations should be forwarded to him.

The Secretary/Treasurer was instructed to revise the Bylaws to reflect the two new positions which have been established: Chair of Membership Committee and Chair of Awards Committee. These changes were unanimously approved by the members present.

Respectfully submitted,
Ronald W. Eck, Secretary

NOMINATING COMMITTEE REPORT

The nominating committee consisting of past Division Chairmen Colby Ardis and Ron Eck has submitted the following nominations for Division officers for 1987-88.

Chair: Mardith Thomas
Iowa State University

Vice Chair: Noel Tolbert
Tennessee Tech University

Surinder Bhagat
Washington State University

Director (1987-90): Prahlad Pant
Univ. of Cincinnati

Dean Parsons
CH2M Hill, Inc.
(Corvallis, OR)

COMPUTER CORNER

FREE ENGINEERING COMPUTER SOFTWARE - BY TELEPHONE

The following material was submitted to the Editor of Civil Engineering Education by Andrew Skwora, Publisher, International Advancement, Inc. (P.O. Box 75537, Los Angeles, California 90075, Phone 805-252-2177). The letter indicated that "... we would like to make our Engineering Bulletin Board System available to subscribers of Civil Engineering Education."

If you have a modem attached to your computer, dial (805) 252-4182. Your computer will be connected to EBBS-computer (ENGINEERING BULLETIN BOARD SYSTEM) and almost instantaneously you are in a position to view a variety of very powerful structural and civil engineering software Programs.

You can download most of the Programs (including the Manual) onto your floppy (or hard) disk and view them later in your office or at home - at your convenience. All programs are fully operational, ready to

perform actual structural/civil engineering calculations saving you hundreds of design hours. (*) Most important: the viewing or downloading session doesn't cost you a penny; your only expense is the telephone call charge (after 6 pm you pay half the regular rate).

SOFTWARE REQUIREMENTS: LOTUS 1-2-3, Release 1A or 2.0 (2.0 if you want graphics), or SYMPHONY 1.0 or 1.1.

HARDWARE REQUIREMENTS: IBM-PC/XT/AT (or compatible) computer; 512K RAM when used w/LOTUS 123; 640K when used with SYMPHONY; Graphics card; MS-DOS or PC-DOS 2.0 or higher.

Your communication settings should be: Baud: 300 or 1200; Parity: none; Length: 8; Stop Bits: 1; X-Modem Protocol; Duplex: full. The Programs can be downloaded in compressed form allowing average size program files of 230K to be transmitted to your computer in less than 12 minutes using 1200 baud. When you get a high-pitched carrier tone, enter two or three Carriage Returns <CR> so that EBBS-software can determine your operating parameters. EBBS operates 7 days a week, 24 hours a day. The Programs are not available by mail.

(*) Complex structural engineering calculations (incorporating almost any imaginable combination of loading conditions) that require (say) 16-20 hours of design work "the conventional way", are performed by the Programs in 15 - 25 seconds!!! During this astonishingly short period of time, the Programs not only provide dozens of answers that are used daily by the engineer in his design work, but in addition, the Programs also generate on the screen (and on color graphics plotter or dot-matrix printer) many STATICAL graphs such as Moment, Shear and Deflection Diagrams. (Such Diagrams when done "the conventional way" are very time-consuming. The Programs "draw" all graphs in 15 - 25 seconds).

CIVIL ENGINEERING SOFTWARE EXCHANGE

Many of our members have expressed a need for educational software to use in their civil engineering courses. Others have developed software which they would like to share. At each of the last few Annual Conferences we have held a software exchange to facilitate the sharing of educational software. Since many are unable to attend the Annual Conference we would like to extend the exchange program through this newsletter.

Starting with the Spring issue of the newsletter, we will be publishing announcements of the software which is available for exchange. In addition, we will publish short notices requesting software. The newsletter will serve as the "bulletin board" for the exchange but will not actually handle the software distribution. Authors should submit the pertinent information about software, including description, operating system, computer, language, memory required, suggested application, and contact address and phone number. Members can then contact the author directly.

If you are interested in participating in this new program, please send the information about your software or software needs to Mardith B. Thomas, Civil Engineering, Iowa State University, Ames, Iowa 50011, by January 15, 1987.

LETTERS TO THE EDITOR

To the Editor:

I would like to congratulate Dr. Ardis for his fine and thought-provoking editorial which appeared in the May edition of the Newsletter. Dr. Ardis raised a number of issues that need to be addressed by the profession, and I should like to comment on some of them.

The first topic discussed by Dr. Ardis was that of salary for entry-level civil engineers. While it is distressing that civil engineers earn less to start than

counterparts in chemical or electrical engineering, I would suggest that more is involved than a question of supply-side economics. First, many civil engineers are employed by state and local government -- many more so, proportionately, I would suspect, than in other areas of engineering. At present, many states are still recovering from the recent recession, and historically have never offered salaries really comparable with those available in the private sector. Whether this situation is "right" or "just" is open to debate; however, I believe the facts bear out my contention. A second factor affecting salaries has got to be the absence from the demand-side of the market of employers in the petroleum and coal mining industries -- another potential source of employment for civil engineers.

In light of these factors affecting the current employment picture I have some doubt whether control over the number of graduates, as suggested by Dr. Ardis would have much impact on entrance salary. Rather, I feel that the answer to the problem lies in expanding the market for civil engineers, rather than the supply of them. As the economy continues to improve I believe the problem will remedy itself.

Another point raised by Dr. Ardis is the quality of the education received by the engineering graduate. I fully agree that an increase in the quality of education is desirable. Not only do we have an obligation in this regard to the graduate, but to society as well. However, I don't think that arbitrarily more rigorous grading is the solution (nor do I believe that this is what Dr. Ardis has suggested either). Rather, it is perhaps needful that the seeming dichotomy in education--training the practitioner vs. training the graduate student--be addressed. Are we fulfilling our responsibility to society if our graduates can't read blueprints or fabrication drawings? Pretty basic stuff, granted, but if we don't teach it who does?

Finally, Dr. Ardis raises the question of image. This is a good point. Just how do we see ourselves as opposed to what the

public perceives us to be? Dr. Ardis seemed to despair that civil engineers are thought of as (gasp!) surveyors! Personally, I feel this is an image we should build on. Surveying today involves lasers, satellites, and measurement of crustal motion--all things which potential civil engineers are aware of, can relate to, and have interest in. What better sales opener for recruiting potential professionals?

In conclusion, I'd like to thank Dr. Ardis again for his fine editorial and I hope that the response and discussion stimulated will lead to a stronger (and better compensated) profession.

Andrew C. Kellie, Associate Professor
Dept. of Engineering Technology
Murray State University
Murray, Kentucky

CALL FOR PAPERS

CIVIL ENGINEERING EDUCATION

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